Health Sector Development for the North and East of Sri Lanka

In Memory of the late

DR. N. SIVARAJAH

1938 - 2019

Health Sector Development for the North and East of Sri Lanka

Fifth Year Memorial Publication of

Late Dr.Nadarajah Sivarajah

10th March 2024

Health Sector Development for the
North and East of Sri Lanka

by Dr. Nadarajah Sivarajah

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Late Dr. Nadarajah Sivarajah
on his Fifth Anniversary Event

Compiled by
Mrs. Malaiaracy Sivarajah
47/3, Adiyapatham Road, Thirunelvely North,
Jaffna, Sri Lanka

Printers
Kumaran Press (Pvt) Ltd
39, 36th Lane, Colombo 6, Sri Lanka
T.P. 011 2364550

Thaaramaai Thaayaanavar
An Unforgettable fifth Year

Four books have so far been published in our attempt to collect and publish in small volumes the multidisciplinary articles Dr.Sivarajah has written from time to time as commemorative publications on Dr.Sivarajah's memorial anniversary. In the first year, Compilation of tributes (23.02.20), in the second year, For health blossomed in Suhamanchari (13.03.21), in the third year, Nutritional survey of welfare centers Jaffna District 2001 (02.03.22), and in the fourth year, Let's enrich the lives of people with disabilities (20.02.23) were published.

All of us are well aware of Dr.Sivarajah's long-standing interest and contribution in planning for the development of the health sector in the North & East. It is well known that he made a valuable contribution to health planning by studying all the issues related to the health sector in depth and exposing the deficiencies in them. Especially, human resource issues in the health sector of the North & East, primary health care, nutrition, physical and mental wellbeing, sanitation, communicable, non-communicable diseases etc. Hence, for his fifth memorial anniversary I am compiling and publishing Dr.Sivarajah's articles related to plans for the development of the health sector in the North & East.

I am pleased to convey my sincere thanks to Dr.A.Keetheswaran, Regional Director of Health Services, Jaffna and Former Provincial Director of Health services, Northern Province, for his comprehensive forward, my brother-in-law Mr.N.Selvarajah, for his continuous support, Head and the staff of the Department of Community and Family medicine for their encouragement and Kumaran Printers for printing the book.

By the grace of almighty, I wish to continue to disseminate the good work of Dr.Sivarajah in his memory in the coming years.

Malaiaracy Sivarajah
10th March 2024.

Foreword

Late Dr. Nadarajah Sivarajah is one of the pioneers of Community Medicine in North & East Sri Lanka. He extended his remarkable contribution as a Public Health Specialist for the development of health services in North & East especially in the critical period. He served in Department of Health, Ministry of Health as a Medical Officer of Health (MOH) in rural areas. With his enormous experience in health care he implemented several public health programmes successfully during the peak of the war period. He was the key person, who initiated the Emergency Ambulance Service in Jaffna District in 2006.

Dr.Sivarajah extended his services to the Faculty of Medicine, University of Jaffna as an eminent teacher in Community Medicine since 1981. After his retirement he delivered his consultancy services to WHO & UNFPA. He was a very good guider, mentor and advice-giver for medical professionals on numerous health issues.

He had a vast experience on implementing the public health programmes successfully at grass root level with limited resources. Although he was an eminent Public Health Specialist, he was a very humble and well-versed person to serve the remote village people at their doorstep. In this manner he implemented leprosy control programmes successfully in Jaffna District. Based on his

vast experience in serving the rural people he wrote several public health articles. related to health care in North & East. He published several articles on future directions of development of health services in North & East. He analyzed human resource issues in North & East health sector and recommended future directions. He involved in several public health researches during the conflict period. Particularly he was very keen in studying the malnutrition status of pregnant mothers and children. He focused on water and sanitation related issues furthermore.

All these articles reflect his vision on health care issues in a war-torn area. These articles guide us to organize health services in a desperate situation, and they help the medical professionals to implement health care programmes. His vision will be remembered forever through his articles and we all are grateful to Late Dr. Sivarajah for these outcomes and recommendations.

I express my appreciation to his wife Malaiaracy Sivarajah, who compiles his publications related to the development of Health Sector in the North & East and publish them in a book on the fifth memorial anniversary of late Dr. Sivarajah.

Dr.A.Keetheswaran
Regional Director of Health Services, Jaffna
Former Provincial Director of Health services,
Northern Province, Jaffna

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HFA 2000 – Prospects for Northern Sri Lanka

Summary

The Public Health Midwife (PHM) is the backbone of the proposed Primary Health Care delivery system in Sri Lanka. The shortage of this category of health worker is a limiting factor in achieving the goal of HFA 2000. When the requirement of PHMs is estimated on the basis of one PHM for a population of 4000, there is a shortage of 18% in the country. This shortage is 47% in the Northern and Eastern Provinces. The worst affected is the Vavuniya health division with a shortage of 60%. The reasons for this shortage are inadequate intake of persons for training and under-utilization of facilities that are available in the Training Schools in the Northern and Eastern Provinces of Sri Lanka.

Introduction

Sri Lanka was one of the signatories to the Alma Ata declaration in 1978, and it pledged to achieve Health for All (HFA) by 2000 AD, using Primary Health Care (PHC) as a strategy. At the 35th World Health Assembly, all member states agreed to mobilize all human resources to the utmost extent possible, for the implementation of this strategy.

Sivarajah, N. (1986). HFA 2000 - Prospects for Northern Sri Lanka. Jaffna Medical Journal, 21(2): 71-74.

The health care delivery system in Sri Lanka is being restructured so that there is a Public Health Midwife (PHM), who is re-styled as "Family Health Worker" (FHW) for a population of 3000[1].

The PHM is to be the back-bone of this PHC delivery system.

It was only in 1897 that midwifery training was started. Until then, domiciliary midwifery was conducted by "Untrained" birth attendents in the villages. The trained midwives, performed their duties in the field, only from 1926 onwards.

Today the job functions of PHMs have changed considerably since the first batch of midwives passed out. With 76.7% of the deliveries occurring in government hospitals[1], and a considerable number occurring in private nursing hemes, the PHM performs very few deliveries at homes and thus has the time for other functions, such as immunization, school health work and health education.

The present training programme of PHMs consists of a course of training in a Nurses Training School for one year, and a further six months of training in the field.

Availability of PHMs

At present, a PHM covers an area with a population between 3000 and 5000. In rural and agricultural areas the population covered is nearer to 3000 and in compact urban areas the population covered is nearer 5000.

If the requirement of PHMs is estimated on an average of one PHM for 4000 population, Sri Lanka will need 4011 PHMs to cover the estimated mid year population of 16,043,000 for 1985. However the number of PHMs available is 3255 resulting in a shortage of about 18%.

However, when the number of PHMs in the Northern and Eastern provinces is estimated, there is a shortage of 47%. (Table 1)

Table 1 : Availability of Public Health Midwives

Area	Estimated Mid Year Population (1985)	* Number of PHMs needed	** Number available	Shortage %
Northern Province	1,249,000	313	167	47%
Eastern Province	1,123,000	281	146	48%
Northern & Eastern Provinces	2,372,000	594	313	47%
Sri Lanka	16,043,000	4011	3255	18%
Sri Lanka (excluding North & East)	13,671,000	3417	2942	14%

** Calculated on the basis of one PHM for 4000 population.*

*** Annual Health Bulletin, Srilanka 1985 p. 31.*

The Northern Province has two Regional Directors of Health Services (RDHS) Jaffna and Vavuniya. The programme in the area of the RDHS Vavuniya is more handicapped with 60% shortage of PHMs (Table 2). The effect of this shortage becomes obvious when global indicators for monitoring HFA 2000 are considered by districts. The persentage of population in Sri Lanka with adequate sanitary facilities at home or in its vicinity is 66.6%. The comparable figures for Mannar (24.2%), Vavuniya (19.2%), Mullaitivu (16.8%) and Batticaloa (17.3%) are poor. Even in the Jaffna District only 55% have adequate sanitary facilities at home or in its vicinity. Inadequate sanitary facilities is the major cause of high merbidity & mortality due to gastrointestinal diseases especially in the young.

Table 2 : Availability of Public Health Midwives in Northern Province

RDHS' Region	Estimated population for 1985	* Number needed	Number available	Shortage %
Jaffna	902,000	226	132	42%
Vavuniya	347,000	87	35	60%
Northern Province	1,249,000	313	167	47%
Sri Lanka	1,6043,000	4011	3255	18%

** Calculated on the basis of 1 PHM for 4000 population*
Source: Annual Health Bulletin, Sri Lanka, 1985 p. 31

The percentage of infants cared for by trained staff in SriLanka is 80%. However, the figure for Vavuniya is 43.5%[1]. The data for Mannar & Mullaitivu districts are not available and are probably closer to those given for Vavuniya.

Suitably trained paramedical personnel in adequate numbers are essential for the achievement of HFA 2000 using PHC as a strategy. There is severe shortage of not only the PHM who is the front line worker in Primary Health Care, but also of other paramedical personnel like Public Health Inspectors, School Dental Therapists and Medical Laboratory Technologists in the Northern and Eastern parts of this country. One reason for this shortage is the absence of training programmes in Tamil for the training of paramedical perssonnol except for the nurses and Public Health Midwives. Another reason for the shortage is the under-utilization of facilities already existing for training. This is well illustrated in Table 3.

The Northern and Eastern Provinces, have each a Nurses Training School situated in Jaffna and Batticaloa respectively. The National Health Manpower study[3] shows that the permanant Nurses

Training Schools other than Jaffna and Batticaloa trained between 43 and 55 students annually during the period 1962-1970. The NTS Jaffna alone has a capability to train around 50 PHMs annually.

Table 3 : Output of PHMs from Nurses Training Schools (NTS) Conducting Training in Tamil Medium: 1976-1985

Year	NTS Jaffna	NTS Batticoloa	Total
1976	-	-	-
1977	05	-	05
1978	33	-	33
1979	-	-	-
1980	-	-	-
1981	78	-	78
1982	48	-	48
1983	20	-	20
1984	02	14	16
1985	-	-	-
Total	186	14	200

Table 3 shows that the output from the two schools had been only 200 during the past ten years. This output is barely sufficient to replace the vacancies created by retirements, resignations and deaths. At present only 11 PHMs are undergoing training at the NTS in Jaffna. The inadequate intake of students for training not only impedes the Primary Health Care strategy, but also increases the cost of training a PHM.

The cause for the poor intake is obscure. It is said that there is a derth of applicants. But data collected recently from Health Volunteers at clinics conducted by Medical Officers of Health in the Jaffna District give a different picture. There were 284 health volunteers with the basic qualifications who were prepared to

undergo training as PHMs. In fact 245 of them had more than the basic qualification needed. Hence there is no shortage in the number of young girls who are eligible and are prepared to be trained as PHMs.

The scarcity in the number of trainees is probably the result of the process of recruitment from advertising the course to selection. Trainees for PHMs course should be selected by open advertisement at the provincial, district and pradesha mandalaya levels.

Unless sufficient numbers are selected and trained as PHMs, HFA 2000 will remain a distant dawn for those who live in Northern Srilanka. In fact, even the existing Primary Health Care is likely to collapse in these regions.

In addition to the training of PHMs and Nurses, post basic training of these paramedical personnel should be organized at the Jaffna Nurses Training School, in order to have the personel to supervise and monitor the work of PHMs.

The Faculty of Medicine, University of Jaffna could participate in such training programme or as an interim measure, organize short courses for these categories of staff with the concurrence of the Ministry of Health.

References

1. Ministry of Health, Sri Lanka (1985) Annual Health Bulletin 1984, Sri Lanka pp 17, 19.
2. Ministry of Health, Sri Lanka (1986), Annual Health Bulletin 1985, Sri Lanka pp 35.
3. Ministry of Health, Sri Lanka (1974), National Health Manpower study in The Republic of Sri Lanka, Sub study 'F', Sri Lanka. pp 129.

02

Health for North-Eastern Province of Sri Lanka (Editorial)

Sri Lanka being one of the signatories to the Alma Ata declaration of 1973, is committed to achieve "Health for all" by the year 2000 AD through Primary Health Care. Although, we have eleven more years, serious doubts have been expressed as to whether we could achieve this goal. The Health Ministry has consistantly highlighted the lack of manpower as one of the limiting factors in the achievement of this goal.

Hospitals and doctors alone cannot achieve that state of physical, mental and social well being, which is expected by 2000 AD. In Sri Lanka, as in most developing countries, the paramedical personnel form the backbone of any health care system.

The most significant political change that had occurred during this year is the devolution of power to the provinces, whereby delivery of health care has been devolved to the provincial administration. It has now become necessary for provincial councils to take stock of the problems in health care delivery at the provincial level, as data provided by the centre do not give a clear picture of the special problems peculiar to each province. This has been amply

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Sivarajah, N. (1988). Health for North-Eastern Province of Sri Lanka (Editorial). Jaffna Medical Journal, 23 (1&2): 1-3.

demonstrared in articles published in the past issues of this journal and others regarding the under registration of deaths.[1,2]

An attempt been made to analyse the shortage of Health manpower in the North-Eastern Province (N-E Province) in the context of the overall availability of manpower in the other provinces (Table 1). The paramedical health personnel needed for the N-E Province has been calculated (Table 2) adapting the criteria used in the Report on staffing[3], prepared by the Planning Division of the Ministry of Health.

Table 1 : Medical and selected paramedical health personnel in North-Eastern Province and other provinces of Sri Lanka (per 100,000 population)

Category of Health personnel	N-E province	Other provinces	Ratio of: N-E Province / Other provinces
Medical officers	8.0	14.1	0.6
Registered/Assistant Medical Practitioners	9.1	5.8	1.6
Public Health Inspectors	3.9	6.0	0.7
Public Health Nursing Sisters	0.2	1.1	0.2
Public Health Midwives	12.4	19.8	0.6
Nursing Sisters	25.1	51.8	0.5
Hospital Midwives	5.8	9.5	0.6
Pharmacists	3.5	2.5	1.4
Dispensers	5.0	4.6	1.1
Medical Laboratory Technologists	2.0	2.2	0.9
Radiographers	0.5	1.2	0.4
Physiotherapists	0.4	1.1	0.4

Source: Annual Health Bulletin, Sri lanka - 1987. Ministry of Health. Sri lanka

Table 2 : Paramedical Health Manpower need in North-Eastern Province (Selected Health Personnel)

Category of Health Staff	* Number available	Estimated need	** Criteria for estimating need	Deficit
Registered/ Assistant Medical Practitioners	216	243	1 per 10,000 population	27
Nurses	598	1301	1 per 4 beds	703
Public Health Nursing Sisters	5	81	1 per 30,000 population	76
Public Health Inspectors	94	270	1 per 9,000 population	76
Public Health Midwives	295	811	1 per 3,000 population	516
School Dental Therapists	7	290	1 per 1,200 students	283
Hospital Midwives	138	196	1 per 20 hospital deliveries per month	58
Medical Laboratory Technologists	49	68	1 per 50 beds in Teaching, Base and District hospitals	30
Radiographers	13	72	2 per machine (Estimated 36 machines)	59
Physiotherapists	11	22	1 per 100 beds in Teaching and Base Hospitals	11

** Source: Annual Health Bulletin, Sri lanka - 1987. Ministry of Health Sri lanka.*

***Adapted from Report on staffing. Planning Division, Ministry of Health Sri lanka, 1981.*

Although there is certainly a shortage of Paramedical Health Manpower in the entire country, these tables show that the shortage is much more acute in the N-E Province.

The reason for this is multifactorial. The repeated ethnic violence in this country has resulted in the polarization of the population on an ethnic basis, whereby persons belonging to an ethnic group preferred to in areas where their ethnic group formed a majority.

During the past three decades, the intake of Tamils for training in the paramedical fields has declined[4]. The reason for this has been mainly political, contributed to a large extent, by the conducting of some courses in Sinhala only, the unrest in the N-E Province, difficulties in travel to and from Colombo and the mode of selection to these courses. Unless this trend is corrected there will be a complete breakdown of the health care system in the N-E Province. The sensitive indicators of health care, like infant and maternal mortality are increasing in the N-E Province indicating that the breakdown has already commenced.

Tables 1 and 2 clearly show that the shortage in the category of Nurses, Public Health Nursing Sisters, Public Health li spectors, Public Health Midwives, School Dental Therapists, Hospital Midwives, Medical Laboratory Technologists, Radiographers and Physiotherapists is more acute in the N-E Province. There is only one Health education Officer for the entire N-E Province with a population of 2.4 million.

In addition, a majority of paramedical Health personnel in the N-E Province are in the 'pre-retirement' age group. When these officers retire in another 5-10 years, a large void will be created.

Well trained paramedical personel in adequate numbers is a pre-requsite for prevention of disease and promotion of health. It

is hoped that the newly elected N-E Provincial Council will take immediate action in this direction.

'Ad hoc' crash programmes only serve a limited purpose. An Institute for Training of Paramedical Personnel for the N-E Province is a must.

References

1. Sivarajah N, Sivagnanasundram C, and Wijeyaratnam A (1984) *Ceylon Medical Journal,* 29 177-184.
2. Sivarajah N, Sivagnanasundram C, and Ponnambalam G (1937) *Jaffna Medical Journal* 22: 1 & 2, 19-24.
3. Report on Staffing. Planning Divison, Ministry of Health Sri Lanka, 1981.
4. Sivarajah N (1986) HFA 2000 - Prospects for Northern Sri Lanka, *Jaffna Medical Journal* 21: 2, 71-74.

03

A Dental School in Jaffna (Editorial)

A comprehensive study of oral health[1] carried out in Sri Lanka during recent times gives some startling facts about the oral health condition of our people. It was observed that 98.3% of the adults in the North-Eastern province of Sri Lanka had periodontal disease and a mean DMFT (Decayed, Missing and Filled Teeth) of 8.7. Out of them only 1.95% were filled.

The above survey also noted that diseased gums and dentofacial anomalies were commoner among the Tamils than other ethnic groups.

In spite of this high morbidity only a very small percentage (approx 11%) of those affected visited a dentist and a still smaller percentage received appropriate treatment.

The problem lies with the providers of oral health care and the consumers. Both tend to neglect dental care for economic and cultural reasons and also due to ignorance.

Even though dental care forms one of the components of Primary Health Care, very little concerted effort has been made to reduce its morbidity. Systematic preventive dental care for the general population is almost non existant, except for the limited work among school children by School Dental Therapists.

The knowledge about preventive dental care is very poor. Most people go to a dentist for the first time (or in some cases on every occasion) for extractions. 79.3% of procedures carried out in hospital

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Sivarajah, N (1989). A Dental school in Jaffna (Editorial). Jattna Medical Journal, 24(2): 51-52.

dental clinics in 1988 in Sri Lanka were extractions (2) and only 5. 45% permanent fillings. The ignorance of the population is a consequence to lack of awareness being created for restorative dental care. This again is due to lack of trained manpower.

The North-Eastern province hasn't a single dental technician and only one Dental Surgeon for 52,000 people. In the Jaffna district one school dental therapist looks after 67,000 school children.

The Dental Health manpower in Singapore is compared to that of North-Eastern province of Sri Lanka in Table 1. Singapore has a population of 2.6 million which is comparable to the poulation of North-Eastern province which has a population of 2.4 million.

Table 1: Dental Health Manpower

	***North-Eastern province of Sri Lanka (1988)**	**Singapore (1983)**
Dental Surgeons	48	113
Dental Therapists	11	276
Dental Technicians	Nil	42
Assistant Dental Nurses	Nil	110
Population (in millions)	2.4	2.6

Source: Annual Health Bulletin 1988. Ministry of Health, Sri Lanka.

It is clear that there is an acute shortage of Dental Health Personnel, especially Dental Therapists and Dental technicians, without whom no proper oral health care could be achieved.

It is time to think of commencing a Dental School in Jaffna to train Dental Surgeons, Therapists and Technicians under one roof.

References

1. Dental Health Unit National Oral Health Survey Sri Lanka 1983-84, Ministry of Health 1985.

2. Annual Health Bulletin 1988, Ministry of Health Sri Lanka 1989.

04

Health Problems in Jaffna

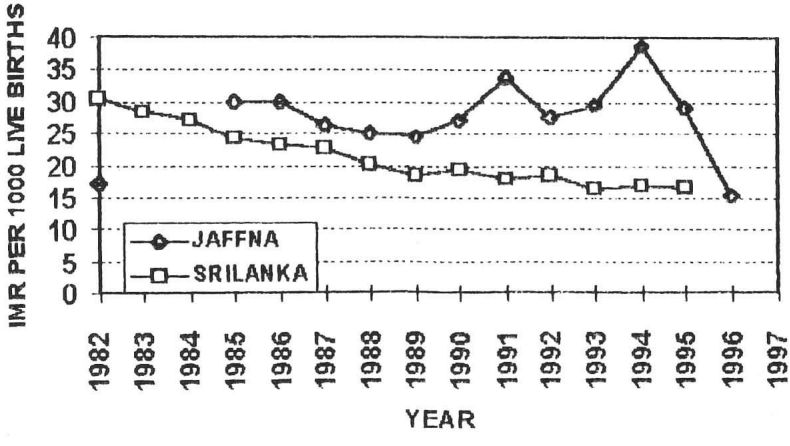
- with emphasis on children

The health status of the children of Jaffna has gradually deteriorated during the past decade.

Mortality

The **Infant Mortality Rates** which were much lower than the national figures in 1983 has increased tremendously as shown in Figure 1. The low IMR for 1996 is due to very poor recording.

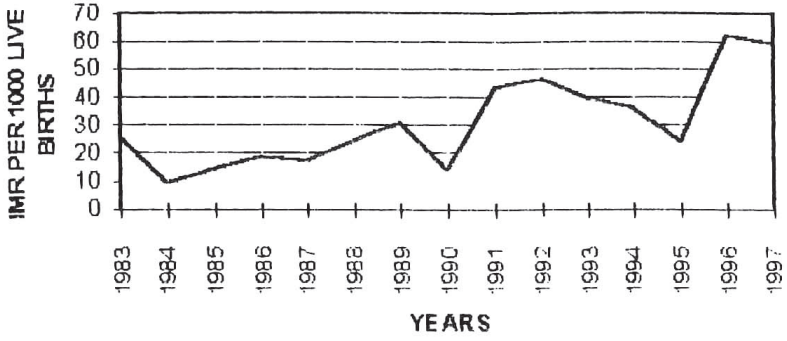
Figure 1 : **Trends in IMR - Jaffna & Srilanka**



Sivarajah, N. (1998). Health problems in Jaffna with emphasis on children. 7p. (Report submitted to Mr.Olara Otwnnu on 04.05.1998 at the District Secretariat, Jaffna-unpublished)

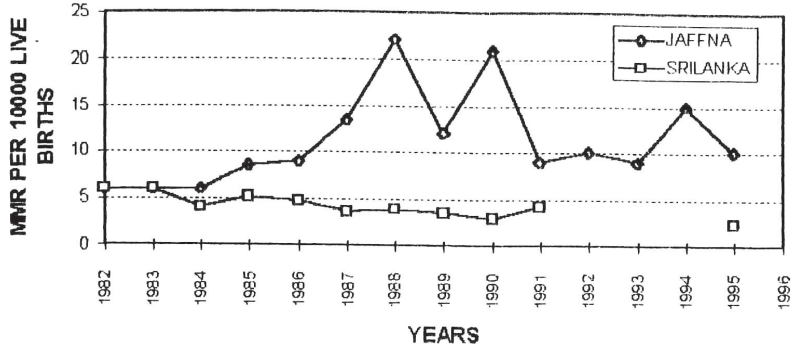
The IMR in the University Field Project area where infant deaths are recorded with a certain degree of accuracy is given below in figure 2. The IMR for 1997 was 58.6 per 1000 live births.

Figure 2 : Trend in IMR - in Jaffna University Project Area



So has the maternal mortality rates increased. Although the national Maternal Mortality Rate is well below 5 per 10000 live births for the past decade, the MMR for Jaffna District has been rising to 22 and 21 in certain years as shown in figure 3.

Figure 3 : Trends in Maternal Mortality - Jaffna & Sri Lanka



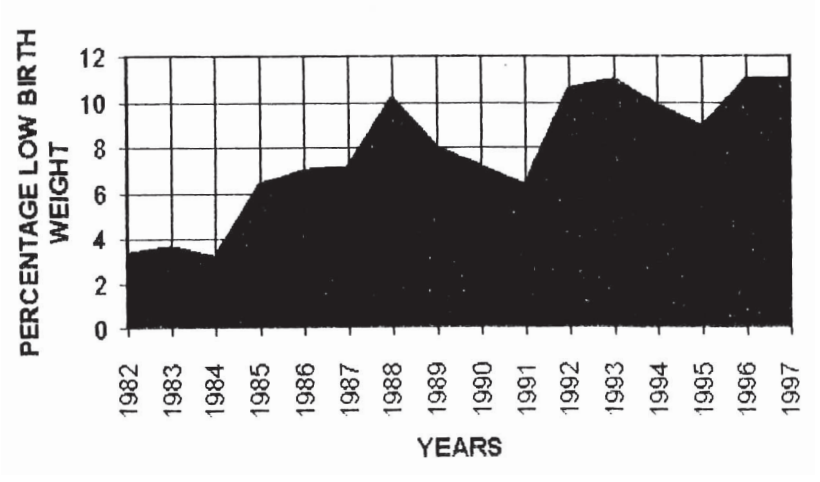
Morbidity

The morbidity due to respiratory tract diseases and gastrointestinal diseases is high as in most developing countries. But the mortality is higher than other countries or other regions of this country. The irregular supply of drugs, lack of medical and paramedical personnel, constraints in transport especially at night have all contributed to this.

Malnutrition among children is prevalent in localized groups, especially among those who have recently returned from Vanni. Judging from the returnees from Vanni the situation of malnutrition in the Vanni must be very serious and need special attention by UNICEF and other bodies concerned with the health of children.

The percentage of **low birth weight babies** born in the University Field project area (fig: 4) has increased from 3.3% in 1982 to 11 % in 1997 (over 200% rise)

Figure 4 : Trends in Birth of Low Birth Weight Babies - University Project Area

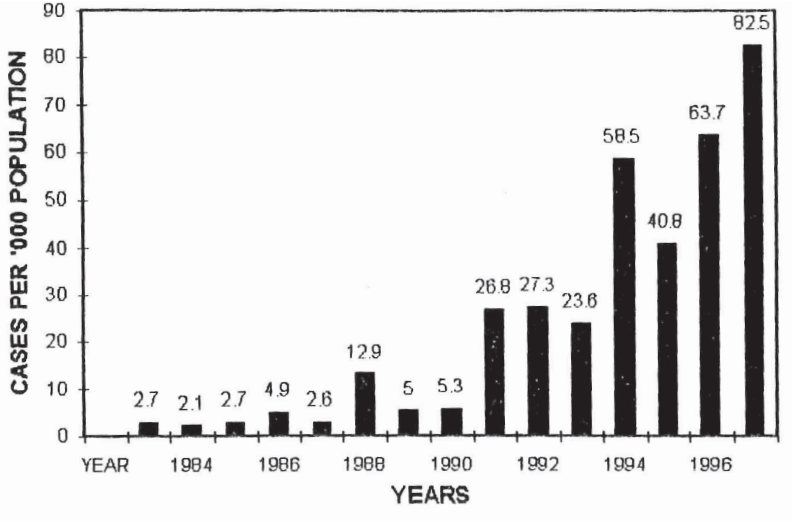


Anaemia among women is prevalent on a large scale, especially among pregnant and lactating women. More than 70% of mothers attending Antenatal clinics have a haemoglobbin percentage of less than 50%.

Malaria has developed into a major problem. In 1984, 1.2% of the total malaria cases in the country was from Jaffna district. In 1995, it increased to 26% of the total malaria cases.

The malaria cases per thousand population is given in figure 5. The cases per thousand population has increased from 1.2 to 82.5 per thousand population.

Figure 5: Malaria Cases Jaffna District 1983 To 1997



Malignant malaria has also increased from 67 cases in 1983 to over 3500 in 1995 & 96.

During the period January to March 1998, 1378 children were admitted to the children's ward of the Teaching hospital, Jaffna 392 (28.4 %) had malaria.

Malaria is rapidly spreading among children. During the period January to March 1998, 1378 children under 12 years were admitted to the Teaching hospital Jaffna. 392 (28.4%) had malaria. Three of them died.

Disability

Disability as a result of the war is a major problem.

During the period of 10 years from 1987 to 97, the Jaipur Foot Workshop provided artificial limbs to 1617 persons. The number excludes the militants and the military who lost their limbs, and others who escaped with injuries which did not necessitate amputation. As shown in table 1, 79.6 % of the artificial limbs were fitted to persons who lost their limbs as a result of war related injuries.

Table 1: Artificial limbs fitted by Jaipur foot workshop (July 1987 to June 1997)

Cause of injury	Upper limb	Lower limb	Total	
			Number	%
Pressure mines	70	797	797	49.3
Shell blast	38	238	276	17.1
Gum shot	18	109	127	07.8
Bomb blast	06	82	88	5.4
War related injuries	62	1226	1288	79.6
Other diseases & injuries	31	295	326	20.2
Not recorded	03	-	03	0.2
Total	96	1521	1617	100.0

Source : Tenth Anniversary souvenir of the Jaipur Foot Programme 1997.

611 persons (37.8 %) of those who had the prosthesis fitted were under 20 years old. These children need attention and rehabilitation and care for several years.

A recent ongoing study which is being conducted on injuries caused by landmines and other unexploded devices (UXD) indicate that on an average 10 persons are injured every month as a result of landmines and UXDs. 25 % of those injured are under 20 years of age.

During an 8-month period (May to December 1997) 19 children under 20 years were injured by land mines and UXDs. 11% of the children were under 10 years old, 42% were 10-14 years old and 47% were 15 - 19 years old

The distribution of children by type of explosion is given in Table: 2

Table 2: Distribution of Children injured by type of explosion

Age group (in years)	Antipersonnel Pressure mine	UXD	Total
5-9	02	-	02
10-14	03	05	08
15 - 19	03	06	09
All ages	08 (42%)	11 (58%)	19 (100%)

58% of the children were injured by handling UXDs. This is a very serious situation where inquisitive children are handling UXDs and maiming themselves. Four out of the 19 children injured during the 8 month study period were employed and all four sustained injuries while working. One 13 years old boy was working as a laborer, The balance were 18 - 19 years old and were employed as a mat weaver, a laborer and the other was working in a metal quarry.

Mental Health problems

Increase in psychological morbidity among adults as well as children has been noticed by psychiatrist working in Jaffna.

In 1994, 12.6% of the first visits to the psychiatric clinics in Jaffna, and 8% of admissions were children under 18 years old. These findings are only the tip of an iceberg. The mjor portion remains hidden under and remains to be brought out.

Shortage of paramedical staff

One of the important factors which caused the increase in infant and maternal mortality is the lack of training of paramedical grass root level workers (Public Health Midwives and Public Health Inspectors.)

Activities Undertaken

Activities undertaken by the Department of Community Medicine, University of Jaffna with assistance from UNICEF

1. Mine awareness programme for grass root level workers working in areas where people are being rehabilitated recently (e.g. Tellipallai)
2. Mine awareness programme for NGOs
3. Mine awareness programme for Administrative officers

Programmes planned

1. 15 mine awareness programmes for grass root level workers to enable them to train the general public
2. Study of socio-economic effects of landmine injuries

3. Assistance to landmine victims
4. Community based rehabilitation of disabled (carried out by the Association for Rehabilitation of disabled with Technical assistance from the Department of Community Medicine, University of Jaffna.)
5. Sewing project for disabled (carried out by the Association for Rehabilitation of disabled with Technical assistance from the Department of Community Medicine, University of Jaffna.)

05

Health Sector Development

The health services and the health of the people of Jaffna have deteriorated to a large extent, during the past two decades. Medical institutions have been damaged and destroyed. Trained medical and paramedical manpower has migrated. In addition training of paramedicals has dwindled. Diseases like malaria, typhoid and other bowel diseases have increased to epidemic proportions. Malnutrition among children is on the increase.

The lack of an effective health service acts as a disinducement for people to return to the Jaffna district and therefore should be given priority in the Rehabilitation of Jaffna.

Some of the major problems in the health sector and suggested remedial measures are given below.

1. Lack of manpower.

This is the major constraint in Rehabilitation of the health sector. Unless this is addressed immediately, the other development programmes for the health sector will be ineffective.

Sivarajah, N. (1998). Health sector development. 7p. (Paper read at the workshop on "Review of Resettlement and Rehabilitation programme of Jaffna peninsula" held at the Fisheries centre, University of Jaffna on 21 September 1998-unpublished)

The lack of consultants and medical officers is a major setback, which can be improved only with return to normalcy in transport and communication to and from the rest of the country.

The shortage of paramedicals could be attributed to lack of regular training. The need and availability of medical and paramedical staff is given in table 1

Table 1: Need (in 2003 AD) and availability of Medical & Paramedical Staff - Jaffna District

Category of staff	Need in 2003 AD	*Availability September 96	Additional number required
Consultants	91	07	84
Medical Officers	245	60	185
Assistant Medical Officer	146	43	103
Dental Surgeons	34	10	18
Nurses	1175	305	870
Public Health Nursing Officers	66	0	66
Public Health Inspectors	80	15	65
Family Health Workers (Public Health Midwives)	330	70	260
Hospital Midwives	248	32	216
Pharmacists	100	42	58
Dispensers	140	26	114
Medical Laboratory Technicians	66	15	51
Radiographers	20	3	17
Physiotherapists	23	3	20
ECG Recordists	12	1	11
EEG Recordists	3	1	2
School Dental Therapists	30	5	25
Radiotherapists	2	0	2
Counsellors	22	0	22
Microscopists (for AMC)	40	8	32

** Annual Health Bulletin 1996, Ministry of Health Colombo, pp. 69,70,71*

Note: Availability of Consultants includes those employed by the University of Jaffna & working in Teaching Hospital, Jaffna.

The immediate establishment of a training centre in Jaffna for paramedicals is essential.

2. Destroyed and damaged medical institutions

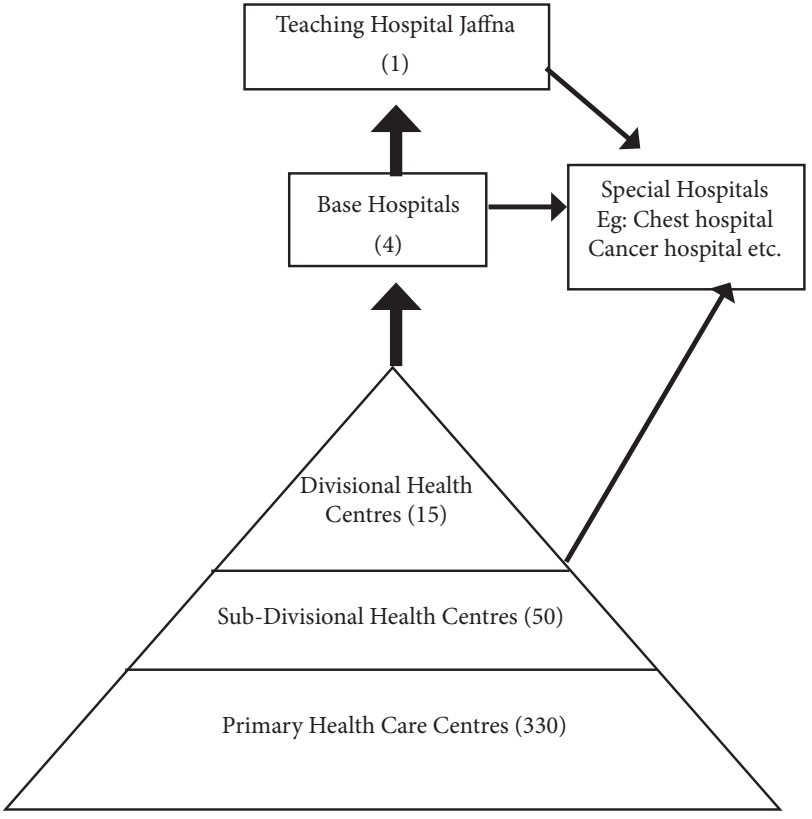
In 1983 there were 49 medical institutions in Jaffna district with 2461 beds. By the end of 1997 there were 27 institutions functioning fully and 10 functioning partly with a total of 1659 beds.

All damaged medical institutions should be repaired or reconstructed. However when rebuilding the health services the near complete breakdown of the health services should be taken as an opportunity to reconstruct the health services on the lines of the Primary Health Care concept, given in figure 1.

3. Poor utilization of peripheral institutions

The reason for poor utilization of peripheral, services (Eg. Maternity homes) is due to lack of facilities to transfer to larger hospitals in emergencies. This could be overcome by establishment of a good communication system and ambulance service.

Figure 1: Proposed Health Care Services for Jaffna District



4. Increase in prevalence of diseases

4.1 Malaria

There is a drastic increase in the incidence of malaria from 2354 cases in 1983 to 38, 778 cases in 1997. (Table 2)

In the early 1980s malaria occured in a handful of persons who had returned from Vanni. Since 1990 the incidence of malaria

increased rapidly and in 1997 one in twelve persons in Jafna have had malaria.

The number of cases of malaria from 1987 is given in table 2.

Table 2: Incidence of Malaria - Jaffna District, 1983 - 1997

Year	Number of blood films examined	Number of cases	Slide positivity rate (%)	Pv	Pf	Mixed
1983	58902	2354	4.0	2282	676	05
1984	26533	1859	7.0	1718	133	08
1985	45108	2393	5.3	2315	72	06
1986	35700	4053	11.4	3786	284	33
1987	36647	2185	6.0	2036	137	12
1988	59661	10885	18.2	10518	353	14
1989	67446	4253	6.3	4103	147	03
1990	52110	4565	8.8	4193	369	03
1991	95356	23371	24.5	20389	2875	107
1992	109116	23844	21.9	21747	2063	34
1993	118178	20711	17.5	19239	1430	42
1994	197549	52385	26.5	48181	4148	56
1995	183867	36957	20.1	33358	3577	22
1996	96723	25474	26.3	21913	3537	24
1997	191038	38778	20.3	36506	2229	43

Source: Deputy Provincial Director of Health Services, Jaffna.

Some of the contributing factors to the resurgence of malaria are insufficient spraying, incomplete treatment and lack of monitoring of drug resistence and insecticide resistance.

In a situation where there is a need for at least 30 spraying units, there are only 10. Although there is a need for 180 000 kg of malathion per year, the supply for 1997 was 14550 Kgs. which is

8% of the annual requirement. For the first nine months of this year (1998) only 9000 kg have been received.

It is necessary to have a consultant in malariology appointed immediately so that the antimalarial work is reorganized and carried out effectively. It is essential to obtain sufficient malathion and increase the number of spraying units. An entomological team is also necessary to monitor the effectiveness of the antimalarial activities.

4.2 Bowel diseases

Bowel diseases such as typhoid and infective hepatitis have been on the increase during the past few years. There have been several deaths too as a result of these diseases. The main cause of increase in spread of these diseases is the lack of sanitation.

Although nearly a third of the population in Jaffna live in urban areas, there is not a single sewage disposal system in the whole of the peninsula. Even the Teaching Hospital Jaffna does not have a sewage disposal system. Raw sewage is being pumped into the lagoon causing environmental pollution.

Sanitory sewage disposal schemes should be implemented in all municipal, and urban council areas given in table 3, and all hospitals.

Table 3: Urban Areas in Jaffna District

Urban areas	Population (1981 census)
Municipal Council	118,224
Jaffna	
Urban Councils	
Chavakachcheri	19,707
Point Pedro	15,023
Valvettithurai	14,121
Town Councils	
Chunnakam	16,118
Kankesanthurai	14,549
Urumpirai	14,039
Nelliyadi	13,925
Pandatherippu	10,439
Manipay	7,667
Chankanai	7,435
Kayts	3,990
Total	**255,237**

4.3 Malnutrition

Malnutrition, especially among children is on the increase. Although severe cases of marasmic - kwarshiorkor is not usually seen the trend is towards it. Unless prompt action is taken, very soon severe malnutrition among children will set in. It is much easier to deal with it now than after overt malnutrition develops among the children.

Some actions suggested are;

- provision of high protein buscuits in all preschools and for children in primary schools.

- Establishment of a factory to produce packeted weaning food.
- Provision of weaning food to all children attending childwelfare clinics.

5. Shortage of drugs

There is an eternal shortage of drugs in the Jaffna district. Some of the factors contributing to this shortage are:

- The delay in obtaining clearence from the Ministry of Defense to transport drugs to Jaffna. Even the Ministry of Health has to obtain permission to send drugs to its own hospitals in Jaffna. This should cease forthwith, or an alternative found.
- The lack of buffer stocks in Jaffna. In the absence of regular supplies, there should be at least a six months stock of drugs in Jaffna. A sufficiently large drug stores should be constructed to store a six month stock of drugs, dressings, and other consumables. In addition there should be facilities to store malathion
- Solar refrigerators should be made available to store vaccines. At least a three month stock of vaccinces should be kept in store and replenished monthly.

6. Lack of special treatment facilities

Although Jaffna has a high incidence of cancer, the facilities available to cancer patients is meagre. The cancer treatment unit at Tellippalai was closed down several years ago, and patients have had to travel to Colombo. The cost of air travel (the only facility available most of the time) is exhorbitant and a sizable number do not go for treatment and prefer to die here.

The cancer treatment centre at Tellippalai should be reopened early.

The same is true of patients with tuberculosis, the only hospital which was available for T.B. patients went within the security zone and since then these patients have no hospital. A new hospital needs to be built.

7. Development of the private sector

The private health sector which was functioning in the Jaffna district has collapsed. It is necessary to revitalize this sector.

06

War and Health in Jaffna

The war in the North-Eastern Province (NEP) of Sri Lanka had been insidious. So had been the decline of the Health services and the Health of the people of Jaffna.

The effects of war started with the war in the early 1980s and continues into the late nineties.

The prolonged conflict has resulted in a serious dislocation of the health infrastructure that once served this area. The war has resulted in

- damage destruction and closure of the main hospital. (the Jaffna Teaching hospital was closed from June to November 1990 and all hospitals in the Jaffna district, except Thenmarachchi and part of Vadamarachchi were closed from November 1995 to April 1996.
- damage destruction and loss of medical equipment
- exodus and displacement of medical personnel
- breakdown of routine maintenance of equipment in health institutions

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Sivarajah, N. (1998). War and health in Jaffna. In: Mahesan, R. (ed.). Proceedings of the 5th Annual sessions of the Jaffna Science Association - Presidential addresses 1997. Jaffna: Jaffna Science Association. p. 39-51. (Sectional Chairman's (Section C) address delivered at the 5th Annual sessions of the Jaffna Science Association, held in August 1997).

- disruption of power supply and shortage of fuel
- breakdown in training of paramedical and field health staff.
- reduced and erratic supply of food, nutritional supplements (thriposha), drugs, vaccines and requirements for preventive health work (malathion, Tropical Chloride of Lime etc)

Morbidity

A severe breakdown in the preventive health programmes has resulted in increase in the incidence and prevalence of several diseases which are uncommon or less common in the rest of the country.

- Malaria which was almost non-existent in the Jaffna District (except in persons returning from Vanni District) is now rampant.
- In 1982 there was an outbreak of Poliomyelitis among the refugees returning from South India which spread rapidly within the local population. In that year there were 96 cases of poliomyelitis in the Jaffna district.
- Due to the breakdown in sanitation and shortage of Public Health staff there had been a massive increase in the incidence of water borne diseases like typhoid, infective hepatitis etc.
- Available evidence, points to a deterioration of the nutritional status of the people, especially among children and pregnant women.

Quite recently, an investigation of the health conditions of returnees from Vanni district and settled down in Urathi - showed an alarming increase in the incidence of

Malnutrition	-	66.0%
Anaemia	-	55.5%
Scabies	-	15.3%
Avitaminosis	-	13.9%
Malaria	-	9.7%
Worm infestation	-	9.7%

Malaria

Malaria, which was mainly a disease prevalent in the Vanni district, gradually spread in to the peninsula. The number of cases increased by five times between 1990 & 1991. The spread was assisted by closure of Elephant pass and by people having to stay overnight at Nallur and Kilali on their way to Jaffna from Colombo. Another contributory factor was the reduction in supply of malathion to Jaffna and virtual abandonment of spraying activities.

In the early 1980s, the malaria cases in Jaffna were mainly imported from Kilinochchi. Today its almost entirely local transmission. Between 1983 and 1994 the malaria cases increased by 22 times. In 1996 one in 17 people in Jaffna have had malaria (Table 1).

Table 1: Incidence of Malaria - Jaffna District: 1983 - 1996

Year	Number of cases	Pv	Pf	Mixed
1983	2354	2282	676	05
1984	1859	1718	133	08
1985	2393	2315	72	06
1986	4053	3786	284	33
1987	2185	2036	137	12
1988	10885	10518	353	14
1989	4253	4103	147	03
1990	4565	4193	369	03
1991	23371	20389	2875	107
1992	23844	21747	2063	34
1993	20711	19239	1430	42
1994	52385	48181	4148	56
1995	36957	33358	3577	22
1996	25474	21913	3537	24

Source: Annual District Health Plan. Deputy Provincial Director of Health Services, Jaffna.

War injuries

Following the mass exodus out of Jaffna, in October 1995, the people returned to Jaffna in late April 1996 into a so called 'cleared area'. During the one year period between May 1996 and April 1997, 296 persons were admitted to the Jaffna Teaching Hospital with war injuries. 207 (69.9%) of them were as a result of blast injuries which included injuries due to landmines, claymore mines, shell blasts and hand grenades.

The particulars of these injuries are given in table 2.

It should be noted that these figures are only of patients admitted to Teaching Hospital, Jaffna. These figures do not include these treated at other hospitals, out patient departments and the dead.

Table 2: War injuries admitted to Teaching Hospital Jaffna. (May '96 to April '97)

Type of injury	Number	Percentage
Blast injury	207	69.9
Gun shot injury	51	17.2
Not recorded	38	12.9
Total	296	100.0

Mortality

Maintenance of mortality data in a war torn area is mostly incomplete, since a fair number of deaths are unreported, misrecorded or missed.

Mortality due to war injuries

Total mortality as a result of the war injuries is always incomplete while the war is going on. The number of deaths among the parties at war is often conflicting. The claims made by each of them varies.

The completeness of the recording of deaths even among the civilians, especially during the exodus is also doubtful.

However the records available at the Teaching Hospital Jaffna shows that for the one year period May '96 to April '97, 263 persons were brought dead to the hospital. This amounts to five deaths on admission per week. During the pre-war period, this was around one per week.

A breakdown of the 263 deaths is given in table 3.

Table 3: Persons found dead on admission to Teaching Hospital Jaffna (May '96 to April '97)

Cause of death	Number	Percentage
Blast and firearm injuries	172	65.4
Disease	35	13.3
Poisoning	14	5.3
Hanging	7	2.7
Drowning	6	2.5
Road Traffic Accident	4	1.5
Not recorded	25	9.5
Total	263	100.0

Infant and Maternal Mortality

The rates calculated from reported infant and maternal deaths in the Jaffna District is given in table 4. In this table the rates for Jaffna district obtained from the Deputy Provincial Director of Health Services is compared with the National figures.

Table 4 : Infant & Maternal Mortality Rate in Jaffna District and Sri Lanka 1980 - 1995

Year	Infant Mortality Rate (per 1000 live births)		Maternal Mortality Rate (per 10 000 live births)	
	* Jaffna	# Sri Lanka	* Jaffna	# Sri Lanka
1980	n.a	34.4	n.a	6.0
1981	n.a	29.5	n.a	6.0
1982	19.0	30.5	6.0	6.0
1983	31.0	28.4	6.0	6.0
1984	39.0	27.2	6.0	4.0
1985	30.0	24.2	8.5	5.0
1986	29.0	23.2	9.0	5.0
1987	26.2	22.6	13.4	4.0

1988	25.0	20.2	22.0	3.0
1989	24.6	18.4	12.0	3.0
1990	27.1	19.3	21.0	4.2
1991	33.7	17.2	7.0	5.0
1992	27.6	18.2	10.0	
1993	29.4		9.0	
1994	38.7		5.0	
1995	29.0		10.0	

*Source: * Jaffna District Health Plan. Deputy Provincial Director of Health Services, Jaffna # Annual Health Bulletin 1994, Ministry of Health Colombo*

Two decades ago (in 1974) the IMR in Jaffna District was 21.1. This was the lowest among the 22 districts in Sri Lanka and was claimed to be lower than the IMR in Washington DC (Attention please, 1979). The district with the highest IMR was Nuwara Eliya with an IMR of 119. The IMR for Jaffna rose to 38.7 in 1994. As there is considerable under reporting the present IMR it is probably much more than the reported figure.

Table 5: Infant Mortality Rate in Sri Lanka by District - 1974

District	IMR (per 1000 live births)
Nuwara Eliya	119.0
Kandy	91.7
Badulla	72.5
Matale	68.2
Ratnapura	66.0
Kegala	60.1
Kalutara	52.9
Sri Lanka	51.2
Galle	50.9

Batticoloa	45.4
Colombo	43.6
Matara	41.6
Amparai	39.1
Kurunagala	38.4
Anuradhapura	37.2
Mannar	36.1
Hambantota	34.4
Trincomalee	32.3
Moneragala	30.8
Puttalam	29.3
Vavuniya	24.3
Polonnaruwa	23.8
Jaffna	21.1

Source: Department of Census and Statistics. In statistical profile of children 1977. Sri Lanka Department of Census & Statistics, Colombo 1978.

The maternal mortality for Jaffna is higher than the national figure. Prior to the war (up to 1983) the MMR for Jaffna was the same as the national figure. But since the war it gradually escalated and in 1988 it was 7 times the national figure and in 1990, 5 times the national figure.

Nutrition

When a shortage of food occurs the first to be affected are children and elders. The prevalence of Acute undernutrition (wasting) and chronic undernutrition (stunting) among children in Jaffna District are given in table 6.

Table 6: Malnutrition in Sri Lanka & Jaffna

	* 1975/76	# 1987	@ 1993	% increase (+) Decrease (-)
Acute undernutrition (wasting)				
Sri Lanka	6.6%	12.9%	n.a	+98%
Jaffna	3.7%	n.a	18.9%	+411%
Chronic undernutrition (Stunting)				
Sri Lanka	34.7%	27.5%	n.a	- 21 %
Jaffna	28.4 %	n.a	31.4%	+11%

n.a : not available

* *Sri Lanka Nutrition Status Survey (Sept.95 - March 76) prepared by US, Department of Health Education and welfare, Public Health Service in cooperation with Ministry of Health, Government of Sri Lanka (CARE / Sri Lanka and US agency for International Development.).*

\# *Sri Lanka Demographic and Health Survey 1987. Ministry of Plan Implementation. Colombo 1988.*

@ *Sivarajah N. Nutritional Survey of the Children in the Jaffna District. Department of Community Medicine. University of Jaffna 1993.*

As shown in table 7, in 1975/76 the division of Superintendent of Health Services (SHS) Jaffna had the lowest prevalence of Acute undernutrition among all the SHS divisions in the country. It was in fact almost half the prevalence of the mean acute undernutrition for Sri Lanka.

This situation has drastically changed following the war. Acute undernutrition has increased by over 400%.

Table 7: Percentage of children acutely malnourished by areas of Superintendent of Health Services (SHS)- 1975/76

S.H.S. Division	% Acutely undernourished
Ratnapura	8.8
Kandy	8.5
Batticoloa	8.4
Galle	8.2
Matale	7.2
Kegalle	7.1
Anuradhapura	6.9
Sri Lanka	6.6
Kalutara	6.2
Matara	6.0
Badulla	5.8
Vavuniya	5.8
Kurunegala	5.7
Puttalam	5.1
Colombo	4.9
Jaffna	3.7

Source: Sri Lanka Nutrition Status Survey (Sept.95 - March 76) prepared by US, Department of Health Education and welfare, Public Health Service in cooperation with Ministry of Health, Government of Sri Lanka (CARE/Sri Lanka and US agency for International Development).

Birth Weight

The birth weight of babies is a good indicator of maternal nutrition. Children with a birth weight <2500 grams are considered Low Birth Weight babies. An increase in the birth of low birth weight babies indicates among others a deterioration in maternal nutrition and failure of the preventive heath care services.

The Jaffna District Nutrition Survey (Sivarajah N, 1993) of 1993 showed that 19% of the children born during the years 1990, 91 & 92 had a birth weight less than 2500 grams.

The increasing trend of the birth of Low Birth Weight babies is shown in data on birth weight available for children born in the University Field Project area of Kokuvil & Kondavil.

The percentage of LBW babies is generally lower in this area than in the rest of the peninsula. However, the trend in the birth of Low birth weight babies is significant as shown in table 8.

It is interesting to note that there has been an increase in incidence of LBW babies following the IPKF operation in 1987 and Economic blockade in 1990.

Table 8 : Percentage of Low Birth Weight Babies born in University Field project area

Year	% LBW
1981	4.7
1982	3.3
1983	3.6
1984	3.1
1985	6.4
1986	7.0
1987	7.1
1988	10.2
1989	8.0
1990	7.1
1991	6.3
1992	10.6
1993	11.0
1994	9.8
1995	8.9
1996	11.0

Disability

It is said the war leaves behind

- an army of widows
- an army of cripples
- and an army of thieves

Data on disability as a result of the war in the Jaffna District is incomplete

Disability as a result of the war could be physical or mental disability.

The Jaipur Foot Workshop which provides prosthesis to those who have lost limbs was inaugurated in 1987. During the past 10 years it has provided artificial limbs to 1614 persons. 80% of them have been for persons who had lost their limbs as a result of war injuries.

Land mines have been another major cause of disability and death. The Jaipur Foot Workshop had been providing at the rate of 60 artificial limbs per year for the past 10 years. During the past few months (May - July 1997) 5 - 10 people are loosing their limbs every month as a result of land mine injuries. This figure excludes the military and militants who lose their limbs in land mines.

Several studies have been carried out in Jaffna on Psychological effects of war.

A study done on War Trauma on children in Jaffna *(Somasundaram D J etal 1995)* showed that nearly half had experienced 5 - 9 war stresses and a quarter over 10 war stresses.

64% had developed recognizable psycho-social sequelae. 25% had major depression. 13% had relationship problems, 15% had alcohol & drug abuse problem and 18% had functional disability.

In another study carried out on school children (under 12 years) in the Vaddukoddai cluster *(Arunakirinathan T et al 1995)* it was found that 77% had atleast one sleep disturbance, 46% had separation anxiety. At least one depression symptom was found in 75%.

Medical Institutions

In 1983 the Jaffna District had 55 Medical Institutions with 2672 beds. In 1995 this figure dropped to 34 medical institutions with 1531 beds (Table 9).

Table 9: Availability of Medical Institutions and Beds

Type of hospital	* 1983		*1986		*1989		#1996	
	No	Beds	No	Beds	No	Beds	No	Beds
Teaching Hospital	1	1015	1	1015	1	1021	1	600
Base Hospital	1	216	1	232	1	203	1	264
District Hospital	6	783	5	625	5	580	4	356
Peripheral Unit	10	430	7	329	7	331	6	206
Rural Hospital	4	91	4	93	4	100	2	47
CD & MH	12	122	9	88	9	83	7	58
CD	21	-	14	-	15	-	9	-
TOTAL	55	2672	41	2382	42	2318	34	1531

*Source: * Annual Health Bulletin 1983, 1986, 1989*
 # Jaffna District Health Plan. Deputy Provincial Director of Health Services,, Jaffna

The Jaffna Teaching Hospital which had 1021 beds, is now functioning with half the number and very few consultants.

The health staff who work in the medical institution have also decreased. In 1981 there were 139 Medical Officers. In 1995 there were only 89 (Table 10). It has further dwindled in 1997.

In 1981 there were 242 nurses and in 1995 the number increased to 420. But when availability of nurses in other districts with Teaching Hospital is compared (Table 11). It is seen that in Colombo district there are 169.4 nurses per 100,000 population which in Jaffna district we have 46.4 nurses per 100,000 population.

Table 10: Availability of Health Staff

Health Staff	1981	1985	1989	1995
Medical Officers				
Number	139	151	110	89
* Rate	16.7	17.0	11.5	9.8
Nurses				
Number	242	367	419	420
* Rate	29.1	41.1	44.0	46.4
Public Health Staff				
Number	233	182	143	123
* Rate	28.0	20.4	15.0	13.6

** Rate per 100,000 population*

Source: Annual Health Bulletin 1981, 1985, 1989 & 1995, Ministry of Health Colombo

Public Health Staff Induces : Public Health Nursing sisters, Public Health Inspectors & Public Health Midwives

Table 11 : Availability of Nurses in Districts with Teaching Hospitals

District	No. of Teaching Hospitals	Number of Nurses	Rate (per 100,000 population)
Colombo	7	3548	169.4
Gampaha	1	1056	66.8
Kandy	2	1445	110.6
Galle	2	824	82.7
Jaffna	1	420	46.4

Source: Annual Health Bulletin Sri Lanka 1995. Ministry of Health Colombo

A more acute situation exists in the case of PHIs & PHMs. There are only around 60 PHMs working in the Jaffna district whereas there should be 300 of them. Similarly there are less than 20 PHIs where there should be 100 PHIS. Most of the PHIs now working are retired and reemployed or on the the verge of retirement.

The shortage of Nurses, PHMs & PHIs is due to inadequate training of their categories of staff during the past several years.

The intake of nurses to the NTS Jaffna for the past 10 years is given in table 12. Although the Jaffna NTS has a capacity to train 50 nurses per year the average annual intake for the past 10 years has been 32.

Public Health Inspectors are trained at the National Institute for Health Sciences. at Kalutara. During the past 10 years very few persons from the North - Eastern Province have been admitted to the course.

Table 12 : Intake of Nurses at NTS Jaffna 1986 - 95

Year	Intake
1986	43
1987	-
1988	59
1989	147
1990	-
1991	-
1992	9
1993	-
1994	-
1995	62
Total	320

PHMs for the NEP are trained at NTS Jaffna & Batticoloa. The number trained during the past 10 years is given in table 13.

Table 13 : Intake of students for Public Health Midwives Training - 1986 – 1995

Year	Intake	
	Jaffna	Batticaloa
1986	12	8
1987	-	-
1988	55	64
1989	77	51
1990	-	-
1991	n.a.	n.a.
1992	-	-
1993	-	36
1994	-	-
1995	-	-
Total	144	159

Note: n. a. - Not available

Here too even though the training capacity of each school is 50 per year on an average 15 students have been admitted to each school per year.

References

1. Arunakirinathan T, Sasikanthan A, Sivashankar R & Somasundaram DJ, [1991] *A study of psychological consequences of traumatic stress in school children under 12 years.* Ninth Annual Scientific Session of the JMA 27 - 29 Aug. 1991. Jaffna Medical Journal 1995; 25:1, 47

2. *Communication strategy project. Attention please,* [1979] Publication of the Communicable strategy project of the Department of Information for the International year of the child. Sri Lanka.

3. Sivarajah N, [1993] *Nutritional Survey of the Children in the Jaffna District (Preliminary report)* Department of Community Medicine, University of Jaffna.

4. Department of Census & Statistics Sri Lanka Nutritional status survey (Sep.75 - March 76). In statistical profile of children 1977. Sri Lanka Department of Census & Statistics, Colombo [1978].

5. Somasundaram D J, Sivayogan S & Muhundan N [1995], *War Trauma in a Civilian population,* Ninth Annual Scientific Session of the Jaffna Medical Association - 29 Aug. 1991. Jaffna Medical Journal 1995; 25:1, 39

07

Reconstruction & Redevelopment of Health Services for Jaffna District based on the concept of Primary Health care

Introduction

Two decades ago the Health status of the people of Jaffna when compared to the rest of the country had been good. The escalation of the civil war since the early 1980s have brought about a severe deterioration of the health of the people of Jaffna which has resulted in the rise in mortality and morbidity

The war has brought about

- damages to the health institutions and equipment
- migration of staff - especially the highly trained staff
- reduced training of middle-level and grass root level health workers
- restriction of drugs coming into Jaffna

Sivarajah, N. (2000). Reconstruction and redevelopment of health services for Jaffna District based on the concept of Primary health care. 15p. (Paper read at the seminar on "Planning for Reconstruction and Re-development in Northern Sri Lanka", jointly organized by the University of British Columbia and the Department of Geography. University of Jaffna and held on 12-14-2000.

As a result

- health manpower has decreased to dangerous levels
- mortality has increased - especially infant and maternal mortality
- morbidity has increased
- the prevalence of disability has increased
- Nutritional levels have decreased - especially among children and pregnant and lactating mothers.

Present Health Status

Two decades ago, the health status of the people of Jaffna was superior when compared to the rest of Sri Lanka.

- The Infant Mortality Rate [IMR] for Jaffna district was the lowest of the 24 districts in Sri Lanka
- The Maternal Mortality Rate [MMR] was equal to the national average
- Malnutrition among the children of Jaffna was very much lower than the rest of the country

But since the escalation of the civil war in the beginning of the 1980s, the health status started deteriorating rapidly.

There has been a reduction in

- Health Manpower

and an increase in

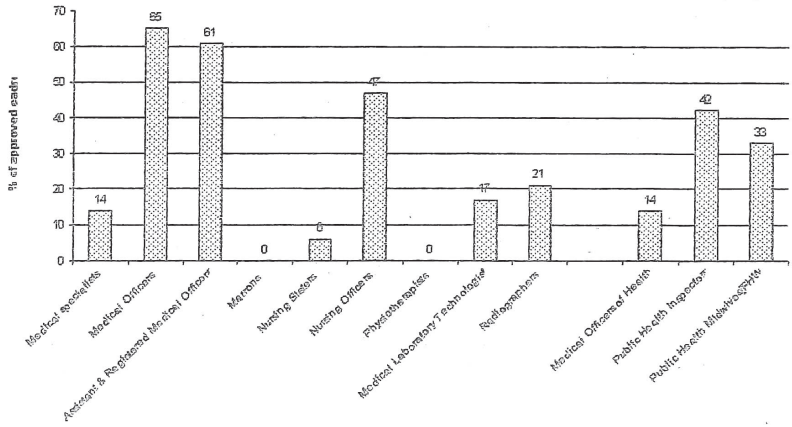
- Infant mortality
- Maternal mortality
- Undernutrition among children and pregnant women
- Birth of low birth weight babies

- Diseases such as
  - » Malaria
  - » Cancer
  - » Infectious Bowel diseases
- Disability
- Psycho-social problems

The decrease in **Health manpower** has contributed to a large extent to the decrease in Health status.

The availability of health manpower as on 31.12.99 is given in Figure 1

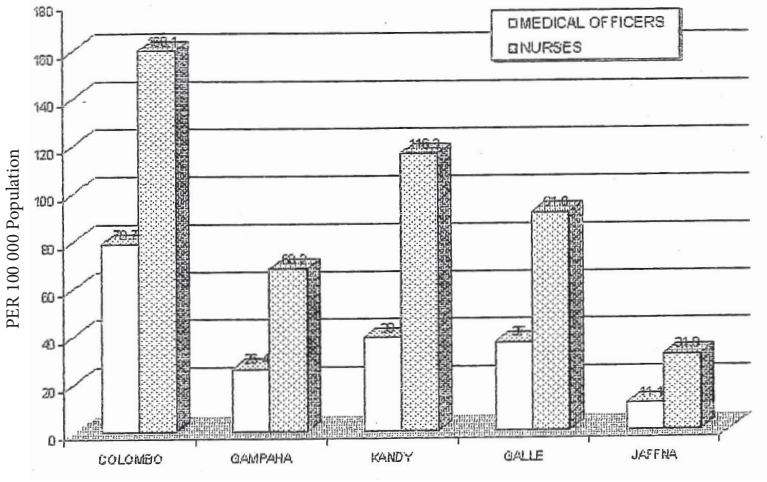
Figure 1 Availability of Selected Health Manpower - Jaffna District [as at 31.12.99]



There are only 14% of the medical specialists and no matrons or physiotherapists. Only 6 % of the nursing sisters are available and only 47% of the nursing officers are available.

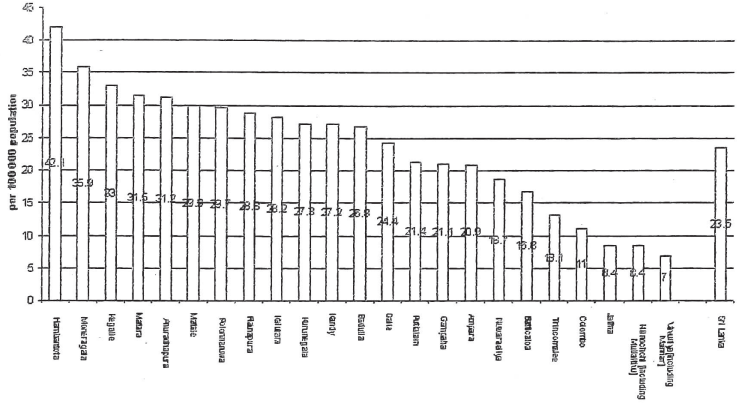
Considering the districts with teaching hospitals, Jaffna district has the lowest number of medical officers and nurses (fig: 2).

Figure: 2 Distribution of Doctors & Nurses in Districts with Teaching Hospitals



The Public Health Midwives (also called Family Health Workers) are the grass root level health workers who provide basic health care. Among the 24 districts in Sri Lanka the districts in the NorthEastern Province [including Jaffna] are at the tail end of the spectrum. (Fig: 3)

Figure: 3 Distribution of Public Health Midwives by Districts - September 1997



The decrease in Health manpower has been due to

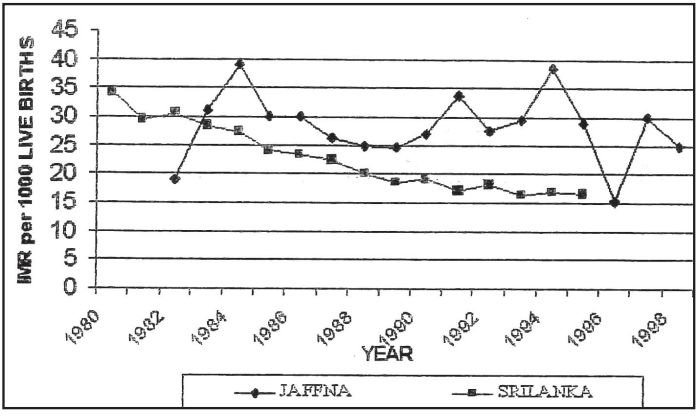
- Outmigration and retirement of trained staff without replacement
- Lack of training of paramedical staff. Most of the paramedical training is in Sinhala medium and also held in Colombo and its suburbs. This prevents most of the Tamils joining the courses.

A few of the courses (training of nurses and Family Health Workers) are held in Tamil in Jaffna. The selection of candidates for these courses is carried out in Colombo. The commencement of the courses and selection is erratic.

The training of Assistant Medical Practitioners [AMP] in Jaffna has been stopped since 1987.

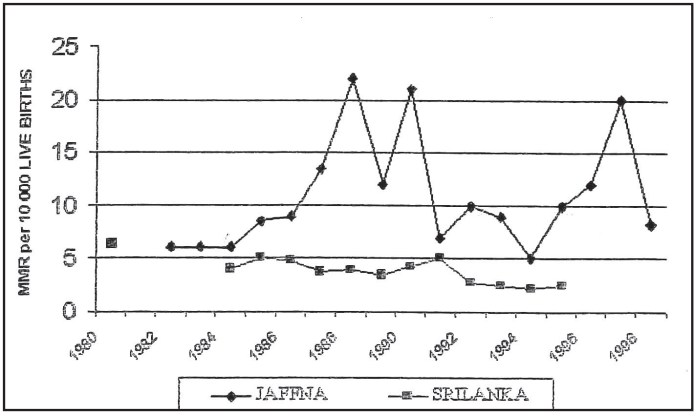
The **Infant Mortality Rate [IMR]** which was 19.0 per 1000 live births in 1982, increased to 38.7 in 1994, while in the rest of the country it fell from 30.5 per 1000 live births in 1982 to 16.8 per 1000 live births in 1994. The IMR showed spikes whenever there was an escalation of the war. [Fig: 4]

Figure 4 : Trends in Infant Mortality



Similarly the **Maternal Mortality Rate [MMR]** also showed a rise in Jaffna district while it has declined in the rest of the country. In 1982 the MMR was 6 per 10000 live births for Jaffna and Sri Lanka. The Sri Lankan figure fell to 2.4 and the Jaffna figure rose to 20 in 1997. Like the IMR, the charts showed spikes during times of the escalation of the war. [Fig: 5]

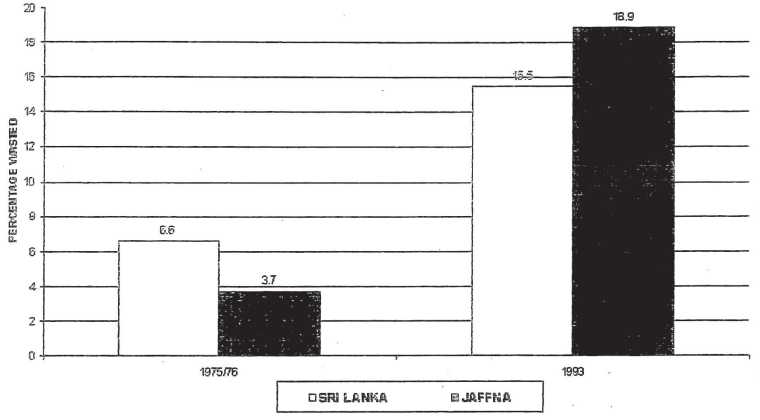
Figure 5 : Trends in Maternal Mortality



It was the same with **Undernutrition among children.** The countrywide nutrition survey 1975/76, showed that Jaffna district had the lowest percentage of malnourished children, which was 3.7%. Subsequent surveys have shown that the percentage of acutely undernourished children in Jaffna has increased to 18.9% [Fig: 6]. An almost 500 % increase.

Although outright famine-struck children are not seen in the streets of Jaffna yet, it will be not too long before scenes like Ethiopia will become evident. Nearly 50% of the children 3 - 5 years who attend clinics in Jaffna have a weight below the third centile of the growth chart.

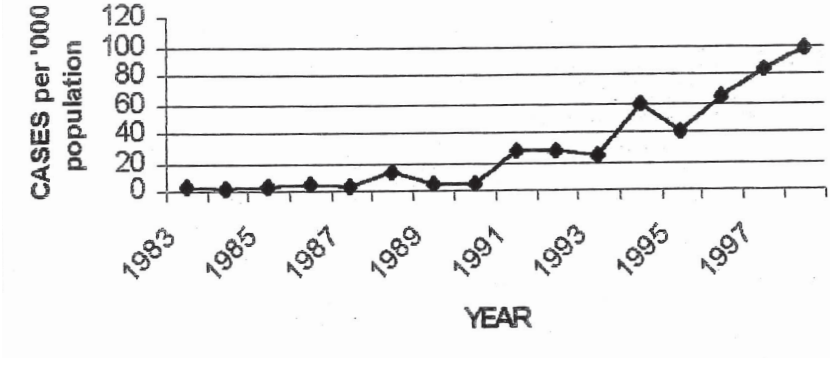
Figure 6 : Undernutrition Among Children - Jaffna & Sri Lanka



The incidence of birth of **low birth weight babies** has also shown an upward trend

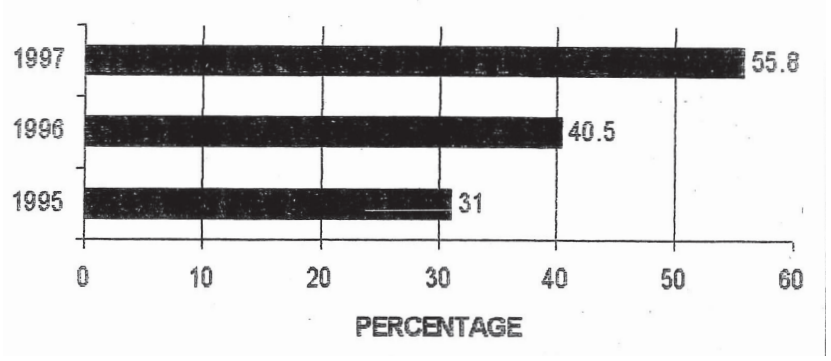
The incidence of **malaria** has increased tremendously during the past decade. Twenty years ago there was only an insignificant local spread of malaria. Most of the cases reported in Jaffna were imported. Today local spread is rampant. In the Jaffna district there were 2.7 cases of malaria per 1000 population in 1982. In 1998 the incidence increased to 97.5 cases per thousand population. [Fig: 7]

Figure 7 : Malaria Cases in Jaffna District 1983-1998



55.8% of the total malaria cases in Sri Lanka occur in the NorthEastern Province [Fig: 8]

Figure 8 : Percentage of Malaria Cases in Northeastern Province 1995-97



Studies carried out in the mid seventies has indicated that the prevalence of cancer has been high in the Jaffna District. The incidence of cancers in the Jaffna district has been twice the mean for Sri Lanka [Panabokke RG, 1984]. Recent observations show that the incidence is rising. The mortality is high and quality of life is poor, as the treatment centre at Tellippalai has been closed down.

The number of disabled as a result of war injuries including landmine injuries has increased during the recent past.

OVERALL DEVELOPMENT PLAN FOR JAFFNA DISTRICT

The destruction of Jaffna District as a result of the war should be taken as an opportunity and challenge to develop the district.

An overall development plan should be drawn up and reconstruction should fit into this developmental plan of a kind that could be sustainable for for the next few decades.

Development of the health sector cannot be taken up in isolation. It has to fit into a complete development plan encompassing, agriculture, industry, water supply, sewage disposal, food sanitation etc.

Health Goals

Some selected health goals to be achieved by Sri Lanka in 2000 AD is given in Table 1

Table 1: Selected Health Goals to be achieved by Sri Lanka in 2000 AD

Measures	Goal in 2000 AD	Present level in Jaffna District
Infant Mortality Rate (per 1000 live births)	15	40
Maternal Mortality (per 1000 live births)	03	20
% Undernourished among children under 5 years.	17.5%	41%
% of iron deficiency anaemia among pregnant & lactating mothers	22%	60-100%
% population with access to safe drinking water	100%	87%
% Population with latrine facilities	100%	54%

Source: Adapted from Annual Health Bulletin 1989. Ministry of Health Colombo

Primary Health Care

To achieve the above goals, the basic health care services has to be modeled on the concept of Primary Health Care (PHC).

PHC is a concept universally accepted and also adopted by the Sri Lankan Government. Unfortunately it has not taken off the ground in Sri Lanka.

The Primary Health Care concept enunciated at the Alma Ata conference by WHO & UNICEF in 1978 envisaged a system of Health care to achieve Health for all by 2000 AD using Primary Health Care as a tool. The PHC concept is that Health care must be

- essential Health Care
- the first level of contact
- be practical
- based on scientifically sound concepts of essential health care
- socially acceptable
- accessible to individuals and communities
- with full participation
- affordable by the country at every stage of its development
- an integrated part of the routine health service
- bring health care as close as possible to where they live and work
- the first element of a continuing health care process

PHC, envisages a Primary Health Care Complex consisting of

- **A Primary Health Care Centre** (Clinic cum residence for a PHC worker) for every 3000 people.
- **A Subdivisional Health Centre** (SDHC) providing essential health care with an Assistant Medical Officer (AMO) and his staff for every 20,000 people and

- **A Divisional Health Centre** (DHC) with a Divisional Health Officer and staff equivalent to the present Medical Officer of Health, providing Health Care to a population of an Assistant Government Agents division (approximately 50 - 70,000).

A PHC Centre would have a Family Health Worker (FHW) who will be trained in Maternal & Child Health, Family Planning, Health Education, School Health and treatment of minor ailments such as, upper respiratory tract infections in children, influenza, simple diarrhoea, worm infestation, pediculosis, scabies & malaria.

A SDHC will have an Assistant Medical Officer [AMO], a midwife, Public Health Inspector [PHI], Public Health Nurse [PHN] and a Family Health Worker [FHW]. It will have 25-50 beds with a labor room. There will be male, female, children and Maternity wards.

A DHC will be a comprehensive health unit. A DHC will have 100-200 beds with Medical Officer & AMOS. A Siddha Physician with a University degree could also be in the team. Simple laboratory facilities will also be available.

A Divisional Health Officer (DHO) will be responsible for all Health Work in the area and will be the supervising officer for all SDHC & PHCs in his area. He will utilize all his staff in treatment, prevention & control of all diseases, which may occur, in his area. The number of different centres needed for the Jaffna District and the availability is given in table 2.

Table 2: Primary Health Care Complex for Jaffna District

Type of Centre	Number required	Number available (with upgrading of existing institutions)	Additional Centres necessary
Divisional Health Centre	15	13	02
Subdivisional Health Centre	43	29	14
Primary Health Care Centre	330	30	300

Note:The number required is calculated for an estimated population of 1,000,000 by 2005

Hospital Services

The Primary Health Care complex will provide services for most of the illnesses and hospital care will be needed for cases referred from the PHC Complex.

Hospitals with facilities for specialized services should have a wider distribution and not be concentrated in Jaffna town.

The hospitals necessary will consist of four Base Hospitals and one Teaching Hospital located in the following places.

Type of Hospital		**Location**
Teaching Hospital	-	Jafina
Base Hospital	-	Velanai
	-	Sandilipay or Chankanai
	-	Point Pedro (already exists)
	-	Kodikamam

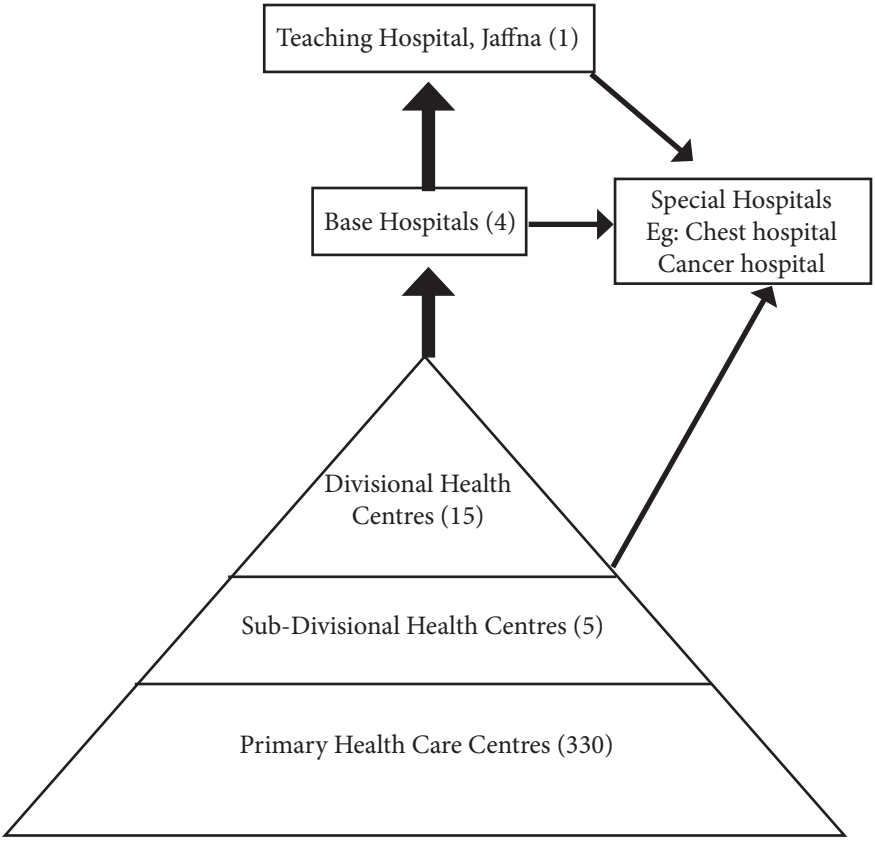
Special Hospitals

Cancer Hospital, Tellippalai

Chest Hospital at Myliddy or Kopay

The channel of referral is given in figure. 9.

Figure 9 : Proposed Health Care Services for Jaffna District (Based on the concept of primary Health care)



Primary Health Care Complex

Recommendations for Reconstruction & Re-development

The following recommendations are made

1. **Immediate measures:** These are measures to be undertaken irrespective of the establishment of normalcy. In fact it is felt that these measures will accelerate normalcy and influence people to return to Jaffna This will also generate jobs for youths and keep them away from militancy.
    - 1.1 Establishment of a Para-Medical Training Centre
    - 1.2 Re-organization of the Anti Malarial activities to achieve total coverage of the Jaffna District
    - 1.3 Re-opening of the Cancer Treatment Centre at Tellippalai
    - 1.4 Establishment of a Sewage Disposal Unit for Teaching Hospital, Jaffna
    - 1.5 Improve facilities at Base Hospital, Point Pedro
    - 1.6 Draw up plans for a new Teaching Hospital complex with University Units and construction of urgent sections
    - 1.7 Local production of supplementary food for children, pregnant & lactating mothers
2. **Intermediate measures:**These are measures to be undertaken when peace dawns and normalcy is being established.
    - 2.1 Establishment of Primary Health Care complexes on a phased out basis. Priority to be given to areas where people are resettling.
    - 2.2 Development of Siddha system of medicine
    - 2.3 Care of Disabled

3. **Long-term measures:** These are measures to be established when normalcy has been established.

   3.1 Sewage disposal schemes for the following towns

	approximate households
• Jaffna	22,000
• Chavakachcheri	4,000
• Point Pedro	3,000
• Valvettithurai	3,000
• Nelliyadi	3,000
• Chunnakam	3,000
• Manipay	1,500
• Chankanai	1,500
• Kayts	1,000
• Urumpirai	3,000
• Pandatherippu	2,000

   - Kankesanthurai (at a later date when the population has resettled)

   3.2 Construction of the following base hospitals

   - Chunnakam
   - Kodikamam
   - Velanai

   3.3 Complete reconstruction of Teaching Hospital Jaffna

References

1. *Panabokke R G. The Geographical Pathology of malignant tumours in Sri Lanka. Ceylon Medical Journal.* 1984;29:4:211-5.

08

Planning for Rehabilitation of Health Services in Jaffna

Introduction

The Health Services in Jaffna has experienced a major disaster, as a result of the war that has been going on for the past two decades. Rehabilitation usually starts after the disaster is over. This is easier. But in Jaffna the situation is quite different.

Amidst the war and the disaster, people continue to live in the area. These people need the health services. We cannot wait until the war is over to start rebuilding the health services. In Jaffna, Rehabilitation has to proceed as the war goes on.

The war has affected all sectors of the people in Sri Lanka. However the most affected are the people living in the Northeast of Sri Lanka. Their earning capacity has been reduced; education has been hampered; health has deteriorated to very low levels. Some of the indicators of health, in the Northeast, may not be as low as in some countries with civil war, but certainly there is a downward trend, which could eventually lead to a situation worse than in some of the war torn countries in the world.

Sivarajah, N. (2001). Planning for rehabilitation of health services in Jaffna. 12p. (Paper presented at the colloquium 'Workshop on the development of planning education programme in the University of Jaffna', jointly organized by the Department of Geography, University of Jaffna and the university of British Columbia, and held on 9-10 February 2001- unpublished).

When rehabilitation proceeds, it should not be merely replacing what has been lost or damaged; or repair part of a hospital that has been damaged. It should not be merely getting back to the status at the commencement of the war, but aim at the status that the country's health status should be in comparison to the rest of the country or perhaps the rest of the world.

Rehabilitation should take into consideration the

- Mortality & morbidity status in the Jaffna district
- Shortage of human resources
- Damage to institutions
- Loss & damage to instruments
- Availability of facilities for maintenance & servicing of buildings & equipment.

It will be necessary to identify whether the health system that was functioning was the ideal. If it has defects, what are they? Can these defects be rectified? If yes how? If not what are the alternative methods?

Health Situation analysis

The Sri Lankan health Service has been a model for developing countries. The country has been spending less on health care and achieving better results than countries with more income levels. In 1994, Sri Lanka, with a per capita income of US$ 800, had a higher life expectancy than Korea, Thailand or Malaysia, and lower Infant Mortality Rate, despite a per capita income less than 10% of Korea's.

Life expectancy now is 75.4 years for women and 70.7 years for men; Maternal Mortality rate is 2.3 per 10 000 live births, Infant Mortality Rate is 15.4 per 1000 live births; Neonatal Mortality rate is 12.9 per 1000 live births and Child mortality is 0.9 per 1000 children 1-4 years old. The population growth rate is 1.2 % and the fertility rate is 2.3. Immunization coverage is generally 95-99%. On an average health care of some sort is found less than 1.4 kms. from any home and free Government western health service is available within 4.8 kms, from any home.

However in the conflict affected areas of Northeast, the situation is different. The people have been affected by internal displacement, destruction of social and economic structure, lack of transport, food shortages, limited source of income with a higher proportion of widows and orphans.

The health infrastructure has broken down. Hospitals have been destroyed as a result of bombing or abandoned due to military operations. Some hospitals remain targets, as military camps and shelling devices are installed near these hospitals. As a result of closure of some hospitals, the existing hospitals are working beyond their capacity.

In addition there is a critical lack of trained human resources, both at the consultant level and at the grass root level.

The nutritional status of the children in Sri Lanka has been deteriorating during the past few decades. But the deterioration of the nutritional status has been rapid and drastic in the areas of conflict. The nutrition status studies of children done in Sri Lanka, including NEP is given in table 1.

Table: 1 Nutritional status of children in Sri Lanka

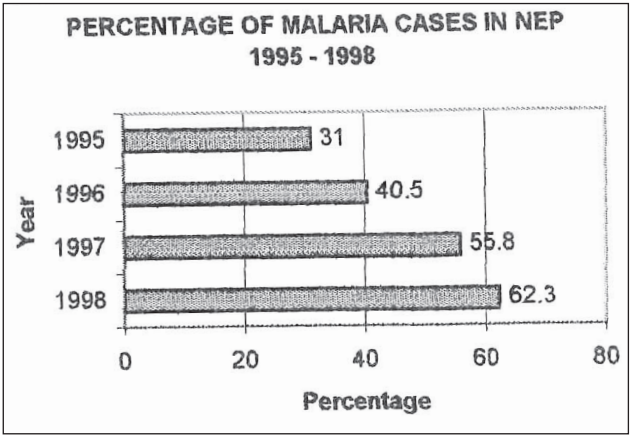
Study particulars	Sri Lanka		North-East Province (NEP)	
	Wasting (weight for height)	Stunting (height for age)	Wasting (weight for height)	Stunting (height for age)
Sri Lanka Nutritional Status survey **(Sept. 75 March 76)** prepared by US Department of Health education and welfare, public health service in cooperation with Ministry of Health, Government of Sri Lanka (CARE/Sri Lanka and US Agency for International development)	6.6 %	34.7 %	3.7% (Jaffna)	
Sri Lanka Demographic Health survey **1987.** Ministry of Plan implementation, Colombo 1988.	12.9 %	27.5%	n.a.	n.a.
Demographic and Health Survey **1993** conducted by the Department of Census and Statistics in areas excluding North Eastern Province	15.5 %	23.8 %	n.a.	n.a.
Sivarajah N **(1993)** Nutritional Survey of Children in the Jaffna District. Department of Community Medicine, University of Jaffna.			18.9 % (Jaffna)	31.4 (Jaffna)

Ines Reinhard & Daniela Kraemer, **(November 1999)** Integrated Food Security Programme, Trincomalee. Baseline Survey on Health & Nutrition. Ministry of Plan Implementation			26% (Trin-comalee)	27 % (Trin-comalee)
David Becker & Michelle Kelly **(2000).** Rapid Nutrition Survey of internally displaced Children under five, in camps, Jaffna Sri Lanka. Medicins Sans Frontiers, Jaffna			18.9% (Jaffna)	
Keetheswaran A. **(2000)** A study of selected aspects of nutritional status of children under five years, pregnant, lactating mothers & adolescent girls in selected welfare centres in Vavuniya district. Study carried out for World Food Programme.			19.5% (Vavuniya)	
Sivarajah N **(2001)** Nutritional survey of Welfare Centres in Jaffna District. Study carried out for World Food Programme			22.6 % (Jaffna)	36.2% (Jaffna)

Malaria

Malaria had been a major problem in the past. The incidence of malaria in the NEP is given in figure 1.

Figure 1

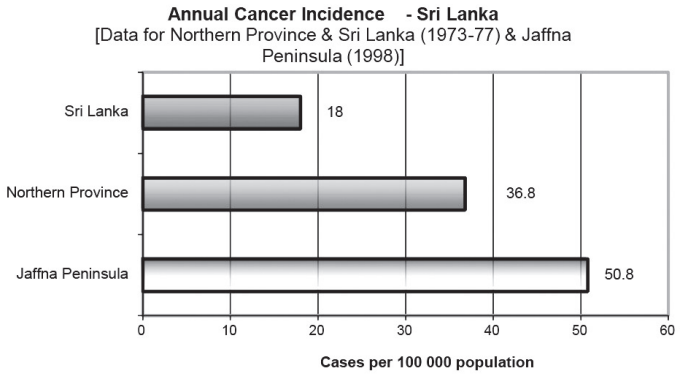


In 1995, 31% of the malaria cases in Sri Lanka were in the NEP. In 1998, this increased to 62.3%. Some recent data show that the incidence is decreasing in the Jaffna district. It is not known whether the situation is similar in the other districts, especially in the Kilinochchi, Mullaitivu and parts of Vavuniya & Mannar districts.

Cancer

Cancer has been a major problem among the Tamil Community especially those living in the North. A study done by R G Panabokke during the period 1973 to 1977 showed that the incidence of cancer was high in the Northern Province. The incidence for Northern Province at that time was 36.8 cases per 100 000 population. During the same period the incidence for Sri Lanka was 18.0 (Figure 2)

Figure 2



Recent documentation in 1998, shows that the incidence in Jaffna District has risen to 50.8 per 100 000 population.

Sanitation

According to the last General Census of 1981, 34.5% of the Jaffna district population of 738,791 lived in Urban Centres (Table: 2.)

But there isn't even a single water supply or sewage disposal scheme operating in the entire Jaffna district except for the limited pumping of water to Jaffna Town from Thirunelvely and distribution by N.G.Os.

Even the sewage from the Jaffna Teaching Hospital is directly led into the lagoon without adequate treatment. Fishing (including the catching of prawns and crabs) is carried out in these waters leading to re-infection of the population.

It is also important to note that according to the 1981 census only 55% of the Jaffna population had access to adequate sanitary facilities at home or in the vicinity *(Annual Health Bulletin, 1985).*

Under these circumstances it is not surprising to find significantly increased incidence of enteric Diseases like Typhoid & Infective Hepatitis.

Table 2: Population of Urban Centres in Jaffna District - 1981

Urban Centre	Population
Municipal Council	
Jaffna	118,224
Urban Councils	
Chavakachcheri	19,707
Point Pedro	15,023
Valvettithurai	14,121
Town Councils	
Chunnakam	16,118
Kankesanthurai	14,549
Urumpirai	14,039
Nelliyadi	13,925
Pandatherippu	10,439
Manipay	7,667
Chankanai	7,435
Kayts	3,990
Total	255,237

Plan for Rehabilitation

We have to consider the losses and damages as stepping-stones to our development, and build on the destruction, to plan a new structure for Jaffna. Most developed countries and cities grew up after a devastating war. This can be true of Jaffna too.

An overall development plan should be drawn up and resettlement, rehabilitation and reconstruction should fit into this

developmental plan of a kind that could be sustainable for several years to come.

Development of the health sector cannot be taken up in isolation. It has to fit into a complete development plan encompassing, agriculture, industry, water supply, sewage disposal food sanitation etc.

The plan for reconstruction should aim at a Health Service increasingly oriented towards prevention, backed up by a reasonably good curative service.

We should also identify a health system that will be suitable to us. An ideal health system should be:

- Socially acceptable to the people
- Scientifically sound
- Based on the local health problems
- As close as possible to the place people live & work
- Affordable to the people at all stages of the development

The concept of Primary Health Care (PHC) satisfies these needs. The PHC concept was adopted by countries (including ours), at the Alma Ata conference as far back as 1978. In fact, though PHC was supposed to be beneficial to underdeveloped countries, it was only the developed countries, which adopted most of its components.

The failure of the underdeveloped countries to adopt PHC was mainly due to lack of political will and political interference. Construction of specialized hospitals was given priority over Primary Health Care. Most politicians usually preferred to put up hospitals, where his or her supporters were, rather than where it is most needed. To provide a good health service there must be a political

will and commitment, and non-interference by politicians in the day-to-day functioning of the institutions.

The Primary Health Care system is the ideal system to start in the present situation where the infrastructure has been totally destroyed. In PHC we start from the grass root level. In fact, in the early 1980s when Pakistan & India had 36 & 27 doctors per 100000 population respectively, Sri Lanka had only 8.1 doctors per 100 000 population (World Health, 1987). But our Health indicators were much better than these countries. The credit for lowering of mortality and morbidity should go to the grass-root level health care workers (the AMPs. PHMs & PHIs).

Health Goals & Services

Some selected health goals to be achieved by Sri Lanka in 2000 AD is given in Table 3.

To achieve this goal, the basic health care services has to be modeled on the concept of Primary Health Care (PHC).

PHC is a concept universally accepted and also adopted by the Sri Lankan Government. Unfortunately it has not taken off the ground in Sri Lanka.

PHC, envisages a **Primary Health Care Complex** consisting of a

- **Primary Health Care Centre** (Clinic cum residence for a PHC worker) for every 3000 people.
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Source: Adapted from Annual Health Bulletin 1989. Ministry of Health Colombo

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Table 4: Primary Health Care Complex for Jaffna District

Type of Centre	Number required	Number available (with upgrading of existing institutions)	Additional Centres necessary
Divisional Health Centre	15	13	02
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Primary Health Care Centre	330	30	300

Note:: The number required is calculated for an estimated population of 1,000,000 by 2005

Hospital Services

The Primary Health Care complex will provide services for most of the illnesses and hospital care will be needed for cases referred from the PHC Complex.

Hospitals with facilities for specialized services should have a wider distribution and not concentrated in Jaffna town.

At present these are several grades of hospitals in Sri Lanka. In fact out side the primary Health Care complex there should be only General Hospitals, Teaching) Hospitals, and Special Hospitals.

Each General Hospital should have about 200-250 beds and have all the 4 basic specialties (Medicine, Surgery, Paediatrics and Obstetrics & Gynaecology)

They should be cited in the following Divisions

1.	Jaffna	(already exists)
2.	Island South	(preferably Velanai)
3.	Valigamam North, West or South West	(preferably near Sandilipay or Chankanai)
4.	Vadamarachchi North	(Point Pedro already exists)
5.	Thenmarachchi	(Kodikamam)

An ambulance service should be available at each General Hospital.

The channel of referral is given in figure. 3

Manpower Training [Establishment of a Paramedical Training Centre]

To improve and maintain the health of people, building of hospitals alone is in sufficient. Manpower is of paramount importance and this is lacking in Jaffna, since training had been a function of the Central Government and had not been implemented satisfactorily.

Although one of the National strategies for HFA 2000 adopted in 1980 emphasized on decentralization, training, especially that of paramedicals has not been decentralized.

Training has a long lead-time. For example the filling of existing vacancies of PHMs alone will take over 7 years at a production rate

50 per year. (which is the training capacity of the Training School at Jaffna)

Hence top priority has to be given to the establishment of a Paramedical training centre in Jaffna. Training has to be one of the first activities in Reconstruction and Rehabilitation.

The Para-medical Training Centre should be capable of training the following categories of staff immediately.

- Public Health Midwives
- Public Health Inspectors
- Assistant Medical Officers

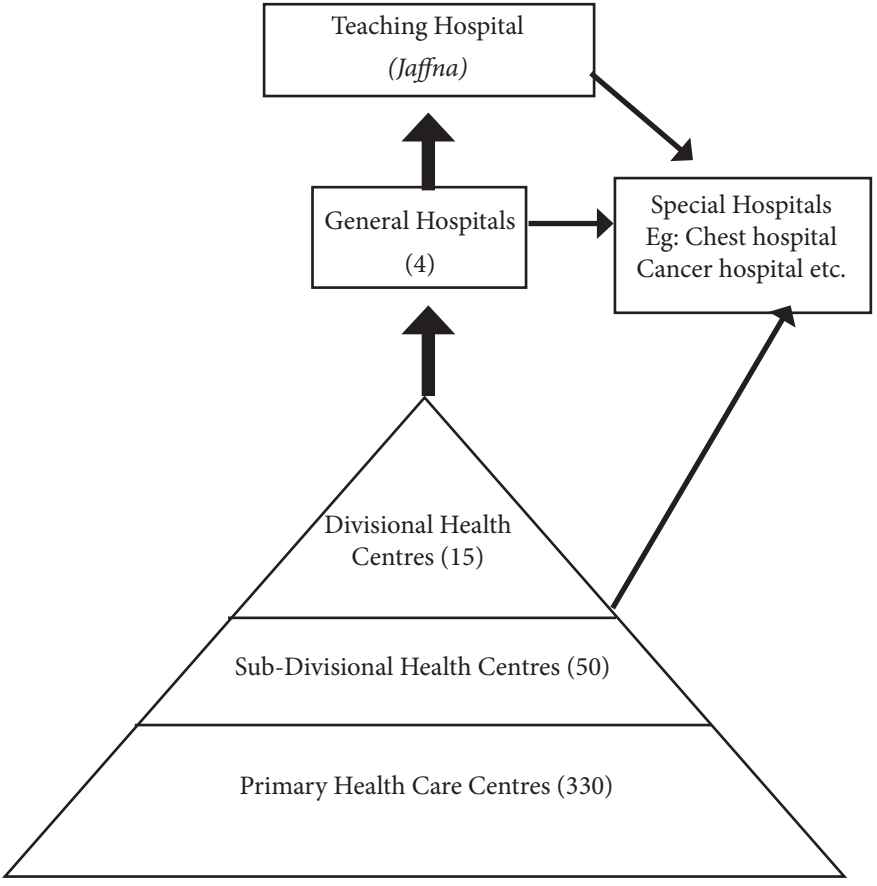
Subsequently the training centre should be capable of undertaking the training of

- Medical Laboratory Technologists
- Physiotherapists
- School Dental Therapists
- Radiographers
- Pharmacists
- Microscopists

The centre should also be capable of providing the following training at a later date.

- In-service training for Paramedical Health Workers
- Post-basic training for Paramedical Personnel
- Public Health training for Medical Officers

Figure 3 : Proposed Health Care Services for Jaffna District



The training of Public Health Midwives should be taken as top priority. Since it will take one and a half years to train a batch of PHMs, the following suggestion is made

> The first four batches of PHMs should be given a training of 3 months and appointed to the field as trainee PHMs, so that they could carry out the urgent field health work. Subsequently, when sufficient vacant areas are filled, they could be called back and the balance training completed in one or two courses lasting a total of one and a half years.

Previous experience with SCF(UK) trained Family Health Workers and Health Visitors have proved this type of training to be very successful.

Fifteen Divisional Health Centres (DHC) are necessary for the 15 divisions (including Pallai). Thirteen of the existing medical institutions could be upgraded, so that they could function as DHC. Two new ones should be constructed.

Control of Food and Water borne diseases

34.5% of the population lives in urban areas,as shown in table 2. But none of these Municipal, Urban or Town Councils has a water supply or sewage disposal scheme.

Jaffna District has always reported high incidence of food & water borne diseases like typhoid, Infective hepatitis and epidemics of cholera.

One of the effective ways of controlling water and food borne infections is an effective water supply and sewage scheme.

In the Jaffna District (according to the 1981 census) 87.8% of the population had access to water at home or vicinity but only

55% had adequate sanitary facilities at home or vicinity. Hence improvement to sanitation should be given priority.

Provision of subsidies to construct water sealed latrines have been in existence for quite some time and is being pursued even now by NGOs with added subsidies. But there appears to be a major problem in this system.

With increase in population and clustering of people, the wells and latrines have been dangerously close to each other which could result in pollution of the under ground water sources. Further, the soil in most parts of the Jaffna Peninsula is of limestone with conduits, which can take the faecal matter to a distance. The construction of more and more water sealed latrines is liable to pollute the underground water to a point of no return.

Hence the establishment of sewage schemes should be undertaken in Municipal, Urban and Town council areas (see Table 2). Since the population in these urban areas range from 4000 to 118,000, plans could be drawn up for each of these towns and NGOs and funding agencies could channel their funds according to their purse.

This will be of a permanent benefit to the community rather than paying subsidies for water sealed latrines. This measure is also likely to reduce the incidence of bowel diseases.

The Jaffna Teaching Hospital, which is a premier hospital in the District has no proper sewage disposal. Raw highly infected sewage is directly pumped into the lagoon where fishing is carried out.

A proper sewage disposal and treatment plant for Teaching Hospital Jaffna is an urgent need.

Undernutrition

As shown in the early part of this paper, this is an emerging serious problem facing the people of Jaffna. The Rehabilitation plan should have provision for a Nutrition Rehabilitation Programme consisting of

- Therapeutic feeding Centres
- Supplementary feeding in
  - » Preschools
  - » Schools
  - » Antenatal, Post Natal & Child welfare clinics
  - » Refugee camps
- An effective Nutrition education programme for
  - » School teachers
  - » School children
  - » School leavers
  - » Pregnant and lactating mothers

Conclusion

The Health Services for Jaffna District needs urgent rehabilitation and has to proceed despite the war.

The ongoing war is liable to cause damage to buildings and hence, major construction work could be delayed

However, Health Manpower training, Nutrition Rehabilitation and treatment, Prevention and control of illnesses have to continue.

09

Health Care for Northeast Sri Lanka

- Reflections for the future

Preamble

Prof. K Balasubramaniam, the immediate past president, the distinguished past presidents, respected members of the Jaffna Science Association, honoured guests, fellow members and students.

I thank the members of this Association for the trust and confidence you have placed on me in electing me to this post of President of this esteemed Association – the highest honour that the members of an Association could bestow on one of their associates.

I accept this post of President of this prestigious Association, with great humility. I assure the members that I will do my utmost to uphold the traditions and maintain the high standards maintained by the Association in the past. I look forward to your support in order to carry forward the activities of the Association during the ensuing year.

I wish to sincerely thank the chairman, Prof. Balasubramaniam for the nice words he has spoken about me.

Sivarajah, N (2001). Health care for North-East Sri Lanka: Reflection for the future London : Thesam. 40p (Presidential address delivered at the 9th Annual sessions of the Jaffna Science Association, held on 04-06 April 2001).

I have been in the field of Community Medicine for the past 30 years, and especially interested in planning for the development of the Health sector of the Northeast Province for quite some time.

The topic, which I propose to present to you today, is relevant in today's political context and in the context of the theme seminar, which was held two days ago.

Introduction

The ethnic conflict in Sri Lanka, which started half a century ago, has now metamorphosed into a large-scale civil war - if not a conventional war.

All sectors of the people have been affected. However the most affected are the people living in the Northeast of Sri Lanka. Their earning capacity has been reduced; education has been hampered; health has deteriorated to very low levels. Some of the indicators of health, in the Northeast, may not be as low as in some countries with civil war, but certainly there is a downward trend, which could eventually lead to a situation worse than war torn countries like Ethiopia.

Therefore, it is imperative that the intelligentsia of this part of the country should foresee the future and take all preventive action to avoid a calamity that would befall our future generation.

Preventive action should be undertaken in all sectors including, health, education, fisheries, agriculture, livestock development, social services etc. The preventive action will include Primary, Secondary and Tertiary prevention.

Primary prevention is to undertake activities in sectors, which have still not deteriorated but likely to deteriorate in the future.

Secondary prevention will be in activities where deterioration has already commenced but not obvious and tertiary prevention will be in sectors where the breakdown is obvious. Primary prevention will prevent or at least delay the breakdown in that sector, and secondary and tertiary prevention will prevent the deterioration of the situation.

In the Health Sector, the destroyed and closed down health institutions and lack of basic equipment in hospitals, are obvious. The lack of health manpower is also obvious. The insidious increase in the Infant & Maternal mortality, water and food borne diseases, the lagging behind in the introduction of newer technologies in medical management are not so obvious. The increase in the number of disabled and elderly among us, the increase in persons affected by war stresses, increase in addiction to alcohol & smoking (and probably introduction of drug abuse) and deterioration of moral and cultural values are rarely thought of. We do not give priority to them as problems or challenges in planning, reconstruction and rehabilitation programmes.

Demographic pattern

The people of the NEP have undergone displacements on several occasions and the population distribution has kept changing so frequently that we are unable to keep a track of the population in the various parts of the NEP.

The distribution of the population at the last census, in 1981, and the latest figures from different sources is given in table: 1.

A cursory review of the population pattern has shown that the population has decreased considerably in the Jaffna district and increased in Vavuniya, Kilinochchi, and Mullaitivu districts

However the estimated population of the Northeast remains around 2.6 million, which is 14 % of the population of Sri Lanka.

Table1: Population (in thousands) of Northeast Province

Districts	1981 (in thousands)	2000 (in thousands)
Jafna	831	502
Killinochi #		152
Mullativu	77	199
Mannar	106	111
Vavuniya	95	117
Total North	**1,109**	**1,077**
Trincomalee	389	352
Batticaloa	330	524
Ampara	256	650
Total East	**975**	**1,526**
N E Grand Total	**2,084**	**2,603**
Sri Lanka Total	14,747	18,927

 # Kilinochchi was part of Jaffna in 1981
Source: Reports from Government Agents, 2000

Health Situation analysis

The Sri Lankan health Service has been a model for developing countries. The country has been spending less on health care and achieving better results than countries with more income levels. In 1994, Sri Lanka, with a per capita income of US$ 800, had a higher life expectancy than Korea, Thailand or Malaysia, and lower Infant Mortality Rate, despite a per capita income less than 10 % of Korea's.

Life expectancy now is 75.4 years for women and 70.7 years for men; Maternal Mortality rate is 2.3 per 10 000 live births, Infant Mortality Rate is 15.4 per 1000 live births; Neonatal Mortality rate

is 12.9 per 1000 live births and Child mortality is 0.9 per 1000 children 1-4 years old. The population growth rate is 1.2 % and the fertility rate is 2.3. Immunization coverage is generally 95-99 %. On an average health care of some sort is found less than 1.4 kms. from any home and free Government western health service is available within 4.8 kms, from any home.

However in the conflict areas of Northeast, the situation is different. The people have been affected by internal displacement, destruction of social and economic structure, lack of transport, food shortages, limited source of income with a higher proportion of widows and orphans.

In a Baseline study of Health & Nutrition in the Trincomalee district, (Ines Reinhard & Danela Kraemer, 1999) it was found that in the 'uncleared' areas of Trincomalee district (where the population is exclusively Tamils), 61 % of the fathers & 66 % of the mothers of children surveyed were unable to read & write compared to 13 – 15 % among the other communities in the same district. According to the Demographic survey of 1994 (which excluded the NEP), the literacy rate for Sri Lanka was 90.1. Nuwara-eliya recorded the lowest literacy rate of 77.7 (AHB, 1999)

The health infrastructure has broken down. Hospitals have been destroyed as a result of bombing or abandoned due to military operations (like Central Camp, in Amparai district). Some hospitals (like in Akkaraipattu & Thirukkovil) are occupied by the armed forces. Some hospitals remain targets, as military camps and shelling devices are installed near these hospitals. As a result of closure of some hospitals, the existing hospitals are working beyond their capacity.

In addition there is a critical lack of manpower, both at the consultant level and at the grass root level.

Deterioration of the Health services

Comprehensive Data on Health status is lacking in the Northeast, as most of the surveys carried out in Sri Lanka after the onset of the conflict excluded the Northeast. Even the Annual Health Bulletin published by the Ministry of Health, lacks common routine data (such as inpatient statistics etc), which are collected through the DDPHS's. Only limited reliable data is available for the Northeast. Adhoc surveys have been carried in small populations and they could be used to give an overview of the health status of the population in the NEP.

Nutritional status of children

The nutritional status of the children in Sri Lanka has been deteriorating during the past few decades. But the deterioration of the nutritional status has been rapid and drastic in the areas of conflict. The nutrition status studies of children done in Sri Lanka, including NEP is given in table 2

In a study carried out by the Ministry of Health in 1975/76 only 3.7 % of the children in the Jaffna district were wasted. In fact, that year, Jaffna district had the lowest prevalence of under-nutrition among the children in the various districts of Sri Lanka. However, later studies in Jaffna (Sivarajah N, 1993) showed that the wasting in Jaffna was 18.9% and stunting was 31.4 %. This has been corroborated by studies done in August 2000, by an MSF team (David Becker & Michelle Kelly, 2000), where they reported an 18.9 % wasting. The wasting was very high (30.7 %) among the 6-17 months old children. A study carried out in Vavuniya (Keetheeswaran A, 2000.) showed that 19.5 % of the displaced children were wasted. Studies carried out in Trincomalee District (Innes Reinhard & Daniela Kraemer, 1999) too showed a similar

trend. In this study of children in Trincomalee 26% of the children were wasted, 27% stunted and 50% underweight. Among the ethnic groups, the nutritional status of Tamil children was worst, both in 'cleared' and 'uncleared' areas.

Communicable Diseases

Communicable diseases have been a major health problem in all countries. With the development and affluence in developed countries, the incidence of communicable diseases started declining and non-communicable diseases such as cardiovascular diseases started increasing. However, in Sri Lanka, we still have the communicable diseases and also an increase in the non-communicable diseases.

The incidence of communicable diseases (like bowel diseases, tuberculosis, parasitic infestations etc) appears to be high in the NEP. The main contributory factors being the lack of sanitary facilities, clean water, poor housing and under nutrition.

Table: 2. Nutritional status of children in Sri Lanka

Study particulars	Sri Lanka		North-East Province (NEP)	
	Wasting (weight for height)	Stunting (height for age)	Wasting (weight for height)	Stunting (height for age)
Sri Lanka Nutritional Status survey **(Sept. 75–March 76)** prepared by US Department of Health education and welfare, public health service in cooperation with Ministry of Health, Government of Sri Lanka (CARE/Sri Lanka and US Agency for International development)	6.6 %	34.7 %	3.7 % (Jaffna)	
Sri Lanka Demographic Health survey **1987.** Ministry of Plan implementation, Colombo 1988.	12.9 %	27.5 %	n.a.	n.a.
Demographic and Health Survey **1993** conducted by the Department of Census and Statistics in areas excluding North Eastern Province	15.5 %	23.8 %	n.a.	n.a.
Sivarajah N **(1993)** Nutritional Survey of Children in the Jaffna District. Department of Community Medicine, University of Jaffna.			18.9 % (Jaffna)	31.4 % (Jaffna)

Ines Reinhard & Daniela Kraemer, **(November 1999)** Integrated Food Security Programme, Trincomalee. Baseline Survey on Health & Nutrition. Ministry of Plan Implementation			26 % (Trinco malee)	27 % (Trinco malee)
David Becker & Michelle Kelly **(2000).** Rapid Nutrition Survey of internally displaced Children under five, in camps, Jaffna Sri Lanka. Medicins Sans Frontiers, Jaffna			18.9 % (Jaffna)	
Keetheswaran A. **(2000)** A study of selected aspects of nutritional status of children under five years, pregnant, lactating mothers & adolescent girls in selected welfare centres in Vavuniya district. Study carried out for World Food Programme.			19.5 % (Vavuniya)	
Sivarajah N **(2001)** Nutritional survey of Welfare Centres in Jaffna District. Study carried out for World Food Programme			22.6 % (Jaffna)	36.2 % (Jaffna)

n.a. *Data not available*

The availability of sanitary facilities and water supply, enumerated at the last census in 1981 is given in table 3

In Jaffna, 45% of the population did not have adequate sanitary facilities. The worst was Batticaloa district, where 82.7% did not have adequate sanitary facilities

The situation at present would be much worse, as a result of damage and destruction caused by the war and inability to repair or reconstruct due to non-availability of building material.

The lack of latrines is a major contributory cause in the high prevalence of bowel diseases. If one assumes that a person passes on an average 200 grams of stools every day, in Jaffna there will be 45,000 kilograms of stools deposited daily, on the Jaffna soil and most of it will find its way into the sources of drinking water or food.

Table: 3. Percent population with adequate water & sanitary facilities at home or vicinity, by districts in NEP

District	Adequate sanitary facilities	Adequate water facilities
Jaffna	55.0	87.8
Mannar	24.2	91.6
Vavuniya	19.2	78.1
Mullaitivu	16.8	63.7
Trincomalee	35.2	68.1
Batticaloa	17.3	79.4
Amparai	28.7	68.7
All Island	66.6	69.6

Source: Annual Health Bulletin 1985 Ministry of Health, Sri Lanka p.19

Even the soakage pits could be a source of contamination of underground water. The Jaffna soil is loamy, and has conduits. If a

soakage pit connects up with a conduit, which has access to a source of water, that source of water could be easily contaminated. Several examples of such contamination in Jaffna have been recorded.

It is not only the public, who are responsible for this contamination of water sources. The Health Ministry is a bigger culprit. Most of the hospitals in the NEP remain the 'reservoir of bowel diseases'. None of the hospitals in the NEP have a sewage treatment plant. The hospitals act a 'reservoirs' or 'amplifiers' of disease. They admit patients with bowel diseases (mostly the virulent forms) collect their excreta and pump them into the open without any form of treatment, thereby contaminating the environment and spreading disease.

The Jaffna Teaching hospital pumps out untreated sewage into the drain outside the hospital, which winds through open drains in the city and ends up in the lagoon where we collect our prawns, crabs and fish. Untreated sewage from Trincomalee Base Hospital is pumped into the sea a quarter kilometre from the Trincomalee beach, which is a bathing resort. The sewage from the Vavuniya Base Hospital overflows into the open land at the rear of the hospital leading to stink. The effluent carrying dangerous bacteria pollute the environment and will find its way to the sources of drinking water.

The Health Ministry's laws do not permit a private individual to construct a house without a facility for proper disposal of excreta, but the government hospitals do not appear to be bound by this law.

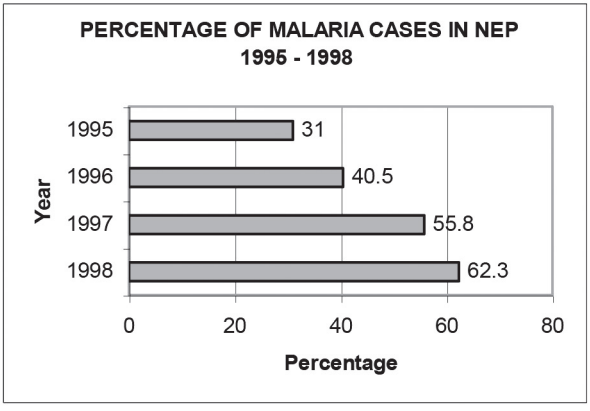
Although it appears that a good proportion of the population has adequate access to water, the quality of the water as regards faecal contamination is doubtful. This is an area, which needs further investigation.

Malaria

Malaria had been a major problem in the past. The incidence of malaria in the NEP is given in figure 1.

In 1995, 31% of the malaria cases in Sri Lanka were in the NEP. In 1998, this increased to 62.3%. Some recent data show that the incidence is decreasing in the Jaffna district. It is not known whether the situation is similar in the other districts, especially in the Kilinochchi, Mullaitivu and parts of Vavuniya & Mannar districts.

Figure 1



Stress related disorders

Sri Lanka's suicide rates are considered to be high when compared to the rest of the world (Table 4).

Table: 4. Annual reported suicides in Sri Lanka (1986 to 1997)

Year	Reported suicides	Incidence (per 100 000 population)
1986	6 784	42.1
1995	8 414	46.4
1996	7 344	40.1
1997	6 418	34.7
1998	6 010	32.2

Source: Police Department Administrative reports & statistical division of Police headquarters quoted in William Hsiao (2000), A Preliminary Assessment of Sri Lanka's health Sector and steps forward

Within Sri Lanka, the NEP, especially the Jaffna District has been known for its high prevalence of stress disorders and suicide rates. An analysis of attempted suicides and successful suicides in Vavuniya, have revealed alarming data. 12% of the deaths at Vavuniya hospital during the year 2000, were due to suicide. 62 suicide deaths and 691 attempted suicides were admitted to Base Hospital, Vavuniya in 2000, from among a population of 117 000. The deaths could be more, because the deaths do not include the outcome of 103 attempted suicide patients transferred to Provincial Hospital, Anuradhapura.

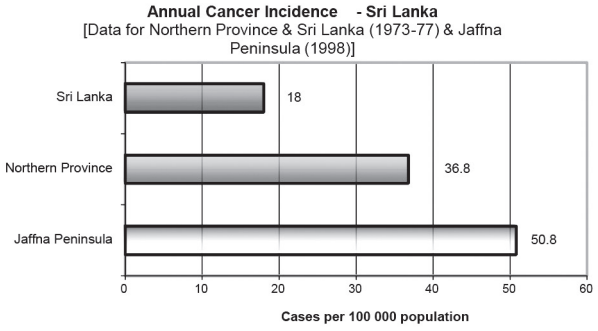
Suicide attempts were three times higher among those displaced and living in "welfare centres" - which is a decent name for refugee camps, than among the general population in Vavuniya.

Cancer

Cancer has been a major problem among the Tamil Community especially those living in the North. A study done by R G Panabokke during the period 1973 to 1977 showed that the incidence of cancer

was high in the Northern Province. The incidence for Northern Province at that time was 36.8 cases per 100 000 population. During the same period the incidence for Sri Lanka was 18.

Recent documentation in 1998, shows that the incidence in Jaffna District has risen to 50.8 per 100 000 population.



Hospital Services

As a consequence of the war several hospitals have been damaged and equipment damaged and destroyed. Some hospital buildings have been completely or partly taken over by the military. Military camps have been installed near hospitals thereby restricting access to patients at nights due to road- blocks. Most of the hospital buildings in the Northeast are several decades old and dilapidated and deteriorating. Very little improvements have been made during the past two decades. Many hospitals lack adequate water supply. Sewage disposal is rudimentary and usually broken down. There has been very little capital investment in hospital development in the NEP during the past two decades. The services provided to the people in the Northeast, is very poor. The most affected are the districts of Kilinochchi, Mullaitivu and parts of Vavuniya, Mannar, and Batticaloa.

There has been an influx of people from 'uncleared areas' into districts such as Vavuniya, Trincomalee & Batticaloa and placed a burden on the District's Health Services. The percentage of displaced populations in five districts is given in table: 5

Table: 5 Displaced persons in selected districts *

District	In welfare centres	Outside Welfare centres	Total displaced	% of district population
Jaffna				
Mannar	29 224	24 243	53 467	51 %
Vavuniya**	17 429	38 690	56 119	41 %
Trincomalee	3 186	11 631	14 817	5 %
Batticaloa	1 535	34 572	36 107	7 %
Amparai	5 364	1 294	6 658	1 %
Other districts **	n.a.	n.a.	540 471	
Total displaced			707 639	27 %
% of Total Sri Lankan population				4 %

* *Source: Report of Government Agent & NEPC. July 2000*

** *Source:1997 estimates of Planning Secretariat, NEPC*

Shortage of staff

The shortage of medical and paramedical staff is a major constraint. The shortage of staff for the NEP is given in table 6.

Over 50% of the shortage of approved cadre is among specialists and Public Health Staff.

The reason for the reluctance of the different grades of the medical and paramedical staff to work in provincial and district

capitals, appear to be different. Some of the reasons are also specific to the different towns. The reasons are also applicable not only to the health staff, but also to other staff that is in short supply.

In the case of the specialist doctors, they are concentrated in cities and major towns, where facilities for private medical practice and education of their children are available. It is possible that they will go to Provincial & district towns, if these facilities are made available. It is possible to attract specialist doctors to provincial and district towns if private nursing homes are constructed. This could be encouraged, by the government providing loans at low interest to entrepreneurs who are prepared to construct nursing homes in specified towns where the need is present. It is estimated that a nursing home with operating theatre, X ray and laboratory facilities with about 25 beds would cost around 25 million rupees. The profit after the 3rd year, is estimated to be around 3-4 million a year. This could be an attractive investment for businessmen.

Table 6 : Cadre position of (selected) staff in the NEP as on 30.09.2000

Category of staff	Cadre	Vacancies
Medical Officers (Specialists)	51	40 (78.4%)
Medical Officers	402	86 (21.4%)
Pharmacists	139	60 (43.2%)
Public Health Inspectors (all grades)	383	109 (28.5%)
Public Health Nursing Officers (all grades)	70	66 (94.4%)
Nursing Officers (all grades)	1191	511 (42.9%)
Public Health Midwives (all grades)	1231	679 (55.2%)
Medical laboratory Technologists	59	22 (37.3%)
Microscopists	40	14 (35.0%)

Another factor which deters doctors from coming to district capitals like, Vavuniya, Trincomalee, Batticaloa, Mannar etc is the lack of accommodation. In these areas suitable housing for doctors is not freely available. Construction of quarters for the doctors may induce them to work in these provincial & district capitals.

Another factor is non-availability of facilities for post-graduate education. All post-graduate training is in Colombo. It is essential for a doctor who is contemplating on post-Graduate studies to be in touch with latest knowledge & technology for which he/she will have to attend classes in Colombo. This is not possible for persons working in Jaffna. Provision of easy and less expensive travel between Colombo and Jaffna, will encourage doctors to opt to work in places like Jaffna.

The lack of paramedical staff is mainly a problem of lack of training of Tamil persons. The training courses for Medical laboratory technologists, Physiotherapists, School Dental Therapists, are held in Colombo and mostly in the Sinhala medium. Students from the NEP who have done their entire education in the Tamil stream are unable to cope up with the studies and several of those who join also leave half way through the course. Another reason for students being reluctant to go to Colombo for the training is due to fear of frequent arrests by the military on security grounds for being young and Tamil speaking from the NEP

The lack of Family Health Workers (FHW) is mainly due to centralized & irregular selections for training. The number of Nurses and Family Health workers trained is given in table 7.

Applications called for training do not reach the prospective applicants on time. Even if they do send their applications, they do not reach the Ministry on time because of postal delays. Usually processing is delayed & candidates are called after several months

or even after years, by which time the applicants have obtained other employment, left the area or married.

Although the two Nurses Training Schools in the NEP (Jaffna & Batticaloa) have the capacity to train 100 FHWs and 100 nurses annually, the mean annual output for the past 10 years has been 63 Nurses and 25 FHWs from both training institutions.

Table 7 : Annual output of Nurses & FHWs from the Training centres in Batticaloa & Jaffna (1991-2000)

Year	Batticaloa		Jaffna	
	Nurses	FHWs	Nurses	FHWs
1991	24	07	nil	49
1992	100	nil	115	08
1993	27	nil	30	27
1994	76	33	29	nil
1995	24	nil	nil	nil
1996	17	nil	nil	nil
1997	nil	30	nil	nil
1998	66	21	27	nil
1999	nil	91	13	04
2000	44	nil	33	23
Mean for 10 years	37.8	14	24.7	11.1

Source: Annual Health Bulletin,1995,1998. Ministry of Health, Colombo & personal Communication from Principal NTS Jaffna

Reflections for the future

The people of the NEP have undergone severe hardships and losses during the past two decades. The war has affected all sectors. The infrastructure has been destroyed. The social and moral character has degraded. Discipline has come down to very low levels. Law

and order is almost non-existent. Some have been forced to think that this mess could be put to order, only by a dictator – may be a benevolent dictator.

Whatever it is, all hardships have to come to an end and we are probably coming to the end of the calamity that has struck us. Should we not start planning now without waiting anymore? The plan need not be a rigid one. It can undergo changes as we proceed. But we must have some plan. All sectors must have a plan for reconstruction, rehabilitation & redevelopment.

The plans should not simply put us back into the status we were in 1980. The world has progressed much forward and we have to keep abreast with the rest of the world. The responsibility rests with the intelligentsia of this country. A distinguished array of intelligentsia of this country are assembled here today and every one of us, especially the younger generation, should resolve to dedicate a part of their time and energy for the development of their motherland. Thousands of young and old have already sacrificed their lives. These supreme sacrifices should not be in vain.

We have to consider our losses and damages as stepping-stones to our development, and use the destruction to plan a new structure for the NEP. Most developed countries and cities grew up after a devastating war. This can be true of the NEP too.

The plan for reconstruction should aim at a Health Service increasingly oriented towards prevention, backed up by a reasonably good curative service.

Basic health care must be available to the people, as near as possible to where they live and work, with access at all times and with an efficient referral system.

The concept of Primary Health Care (PHC) satisfies these needs. The PHC concept was adopted by countries (including ours), at the Alma Ata conference as far back as 1978. But only few countries have even attempted to implement the programme. In fact, though PHC was supposed to be beneficial to underdeveloped countries, it was only the developed countries, which adopted most of its components.

The failure of the underdeveloped countries to adopt PHC was mainly due to lack of political will and political interference. Construction of specialized hospitals was given priority over Primary Health Care. Most politicians usually preferred to put up hospitals, where his or her supporters were, rather than where it is most needed. To provide a good health service there must be a political will and commitment, and non-interference by politicians in the day-to-day functioning of the institutions.

The Primary Health Care system is the ideal system to start in the present situation where the infrastructure has been totally destroyed. In PHC we start from the grass root level. In fact, in the early 1980s when Pakistan & India had 36 & 27 doctors per 100000 population respectively, Sri Lanka had only 8.1 doctors per 100 000 population (World Health, 1987). But our Health indicators were much better than these countries. The credit for lowering of mortality and morbidity should go to the grass-root level health care workers (the AMPs. PHMs & PHIs).

One of the major Health challenges today in the NEP is the lack of these paramedical personnel. Development of health manpower is a process with a long lead-time. Therefore manpower development planning should target the requirement for at least 10 to 15 years hence and the effort has to be sustained. The manpower requirements for the NEP are given in table 8.

Table: 8. Paramedical Health Manpower requirement for NEP

Category of staff	Requirement	Availability	Shortage	Criteria
Assistant Medical Officers	250	192	58	1 per 10,000 Population
Nurses	3375	1077	2298	1 per 4 beds
Public Health Nurses	250	04	246	1 per 10,000 Population
Family Health Workers	1400	353	1047	1 for 3000 population
Midwives for hospitals	350	198	152	1 per 15 deliveries/ month
Public Health Inspectors	400	169	231	1 for 9000 population
Medical Laboratory Technicians	210	48	162	1per 50 beds in Divisional & General Hospitals
Pharmacists	300	60	240	1 per 300 beds & 1 per 200 OPD & 1 per SDC
Physiotherapists	100	7	93	1 per 100 beds in Divisional & General Hospitals
Radiographers	230	15	215	2 per machine

Assumptions for estimates :
The population of NEP will be 3.5 million by 2005
Total beds in NEP will be 13,500

Criteria for calculation of requirement are based on the Report on staffing, Planning Division, Ministry of health. 1981

Sri Lanka is producing 800-900 medical graduates annually. The Hon. President has announced in December 1999, the opening of an additional medical school in Batticaloa. The Batticaloa hospital

has already been upgraded to a Teaching Hospital. A further 100-200 foreign trained medical graduates are returning to the country and registering with the Sri Lanka Medical Council every year. In 15 years we will have 15,000 more doctors than we have today. There is a fear in some circles that we are overproducing medical graduates. Considering the potential this may not be correct. But cessation of training paramedics like AMOs, because there are enough doctors is not in the correct direction.

In the whole of Sri Lanka (including the NEP), today secondary and tertiary care hospitals are overcrowded with patients who need primary care. Highly skilled manpower is often providing care that requires lesser skills.

The AMOs are the best persons to provide primary & secondary care in the remote areas, until the state could find the resources to ensure that diagnostic and treatment facilities in which the medical graduates are trained are made available in all the remote areas of the country. Sending the medical graduates to remote areas where there are no facilities to practice what he has learnt will only demoralize and make him frustrated. The ideal person for these outreach centres will be the AMO.

In addition, the lack of other paramedical staff like Nurses, Physiotherapists, Medical Laboratory technicians, Pharmacists, Social workers etc. is a major problem. The training of these categories of staff is conducted only by the central government by legislation, and in sufficient numbers to fill its own cadre. With the proposed privatisation of health it is necessary to produce these categories of staff outside the health sector.

This state monopoly in medical and paramedical training should cease. The Private sector and the Universities should be given permission to carryout training of these categories of the

staff under the guidance and supervision of a controlling body, which should monitor the training.

The availability of Family Health Workers and Public Health Inspectors in the NEP is low because of lack of training in the Tamil medium. Additional training centres should be put up to clear the backlog. At the same time training should be devolved to the NEP and selection should be done locally at the district level so that persons who are prepared to work in the villages at grass-root level, and those who know Tamil could be recruited.

In 1998, the Health Ministry selected 75 students for training as FHWs at the NTS Jaffna. But only 4 students turned up. 45 of them were not sent because they did not know Tamil.

Another factor to be given thought is whether the training of medical and the different paramedical personnel separately, are ideal. Care of the patient is teamwork involving the Consultant, House Officer, Nurse, attendant, Laboratory technician, physiotherapist and all such paramedics. Should not this teamwork start during the training itself?

Thiruvalluvar, when he spoke about treatment said,

உற்றவன் தீர்ப்பான் மருந்து உழைச்செல்வான் என்று
அப்பால் நாற் கூற்றே மருந்து.

- திருக்குறள் (950)

உற்றவன்	-	நோயுற்றவன்
தீர்ப்பான்	-	வைத்தியன், தெய்வம், நண்பன்
மருந்து உழைச்செல்வான்	-	தவறில்லாது மருந்தை கொடுப்பவன் (தாதி, மருந்து கலவையாளர், முதலியோர்)

Which means, in treatment and cure of a disease, the patient, the doctor, the medicine (which includes the drug, injection, physiotherapy, dressing of a wound) and the administrator of the medicine (which includes the nurse, pharmacist, physiotherapist, etc) all have to cooperate to cure the patient. They cannot work in isolation. There has to be teamwork. This teamwork has to start during the training period. For this, it is important that training of medical and paramedics is done under one roof.

Health Care Services

The health Services in the Northeast has to be reorganized on the basis of Primary Health Care. The NEP has 74 divisions – each under the administration of a Divisional Secretary. Each such division will form a Primary Health Care complex with a Medical Officer of Health (MOH) or as presently renamed Division Director of Health Services (DDHS). Each division will be divided into smaller units, having a population of 2500 to 3000. Each such unit will have a Family Health Worker (FHW).

The FHW will be the grass-root level worker in the health structure providing Primary Health Care to the population. (Figure:2)

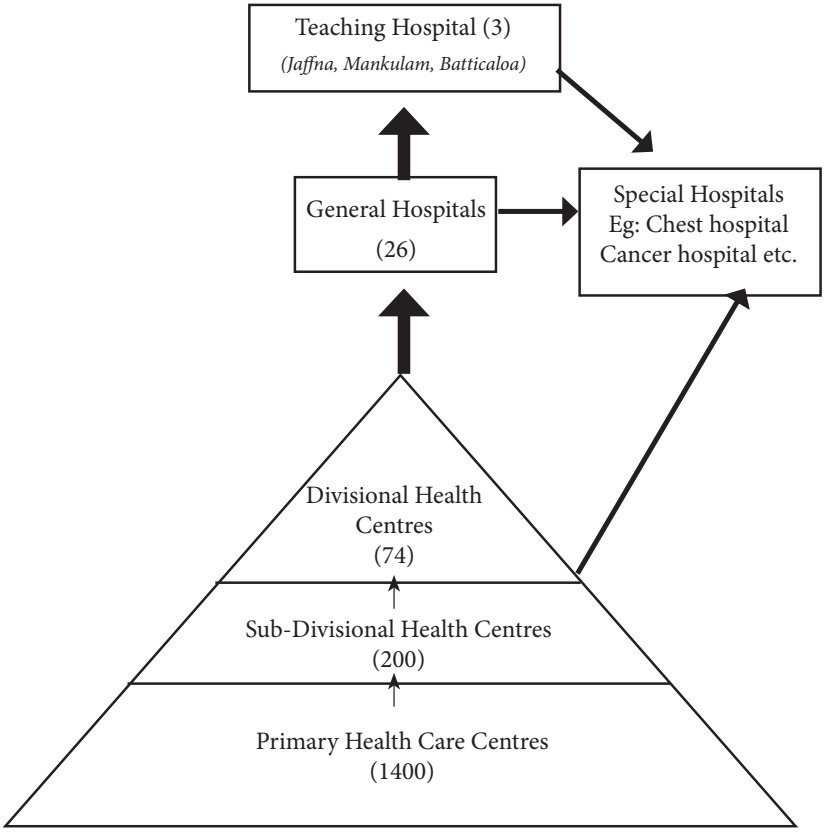
Three to four FHW areas will form a Sub-Divisional Centre (SDC). This Centre will have an Assistant Medical Officer (AMO), a Public Health Nurse (PHN) and a Public Health Inspector (PHI). There will also be a small hospital with about 15 beds and labour room facilities.

The next higher level of care will be the Divisional Health Centre (DHC). This will be under the DDHS and have 50-100 beds basic diagnostic facilities including a laboratory and X-ray facilities. There will be one DHC for each division.

Sri Lanka has several grades of hospitals. The grading of hospitals is obsolete and not consistent. There should be only General hospitals outside the Primary Health Care complex

General hospitals will be mainly curative institutions treating patients referred from the Primary Health Care complex. They will have around 500 beds with all specialities.

Figure: 2. Proposed Health Care Services for Northeast Province



Primary Health Care Complex

Note : ↑ Channel of referral

Table: 9. Distribution of Institutions and beds by districts -1999

District	Institutions	Beds	Beds (per '000 population)
Jaffna	25	2011	2.0
Kilinochchi	5	243	1.9
Mannar	5	310	2.4
Vavuniya	3	253	2.0
Mullaitivu	4	263	2.5
Trincomalee	12	851	2.4
Batticaloa	23	1168	2.3
Amparai	12	1516	2.6
Total NEP	89	6615	2.4
Sri Lanka	556	55195	2.9

Source: Annual Health Bulletin 1999, Department of Health Services, Sri Lanka

At present, Sri Lank has 2.9 beds per 1000 population (Table 9). The NEP has 2.4 beds per 1000 population. The range is 1.9 in Kilinochchi to 2.6 in Amparai.

By the year 2000, NEP should have 13,300 beds, so that there will be 3.8 beds per 1000 population. The suggested distribution of beds in the Primary Health Care system and General Hospitals is given in table 10&11.

In addition to these General Hospitals, 'specialized' hospitals such as hospitals for cardiac surgery, neurosurgery, oncology etc will have to be constructed in association with the teaching hospital or independently.

Table: 10. Proposed distribution of Hospital beds by type of Institution

Centre / Hospital	Number of Institutions	Beds per centre / Hospital	Total
PHC Complex			
PHC Centre Sub divisional centre Divisional centre (Hospital)	1400 200 73	Nil 15 50	 3000 3650
General Hospitals	26	200 to 500	7000
Total			13650

Table: 11. Suggested Distribution of Hospital beds in the Northeast Province

District	Estimated Population in 2005	General Hospitals	Primary Health Complexes	Number of beds		
				Need	Available	Shortage
Jaffna	800,000,000	4	14	3040	2011	1029
Kilinochchi	300,000,000	2	4	1140	243	897
Mannar	200,000,000	3	5	760	310	450
Vavuniya	300,000,000	3	4	1140	253	887
Mullaitivu	200,000,000	2	5	760	263	497
Trincomalee	600,000,000	5	11	2280	851	1429
Batticaloa	600,000,000	3	12	2280	1168	1112
Amparai	500,000,000	4	19	1900	1516	384
Total	3,500,000,000	26	74	13300	6615	6685

Under nutrition

Another major problem we are facing is the problem of under nutrition. Recent surveys in Jaffna, Trincomalee and Vavuniya have revealed that nearly 50% of our children are malnourished. A recent study in the welfare centres in Jaffna have shown that, 56% of the pregnant women, 42% of the lactating women and 54% of the adolescent girls are anaemic. A study done in Sri Lanka (excluding NEP) has revealed that 36% of the children are suffering from Vitamin A deficiency. Study has not included the children in the NEP, but it could be assumed that the situation is much worse here. This is an alarming situation, and unless immediate action is taken, we are going to be left with a generation of physically & mentally retarded people.

Nutrition rehabilitation programmes for children under-five have to be started immediately in areas of high prevalence. The Nutrition Rehabilitation Centres should be set up in association with & under the supervision of the local provincial or district hospitals.

Re-introduction of nutrition programmes in schools has to be done. High protein biscuits or milk has to be given to all school children. In addition, teenage girls have to be given more attention regarding their nutrition. Since anaemia is a major problem in adolescent girls, which has an effect on pregnancy, childbirth and birth weight of the baby, action should be taken to correct the anaemia at this stage. Providing biweekly iron supplements in school could easily do this.

To achieve this, cooperation of teachers is essential. It will be necessary to empower teachers on Health and Nutrition. They should be trained in identification, correction and referral of nutrition problems in children. This component should be introduced into the teacher training courses.

Physical & Mental Disability

As a consequence of the war, we have with us an army of physically, mentally and socially disabled.

The physically disabled are the end result of continuous bombing, shelling, shooting, landmines and illness.

Landmines have become a major cause of disability. During the period 1996-98 we had on an average 11 cases of landmine injuries every month. This dropped to 4 per month 1999. By the end of 2000 and early 2001 the incidence is rising again. During the first quarter of this year we have already had 24 cases of Landmine injuries. Even if peace comes, the problem of injuries due to landmines will remain with us for another few decades. Some of the landmines, which have been laid, could remain active for over 50 years.

Due to lack of proper health care, such as physiotherapy, a number of sick people who could get back to normalcy remain disabled. In the Jaffna Teaching Hospital where there should be 14 physiotherapists, there are only two – one of them is a retired person who has volunteered to serve.

Although there are increasing number of physically disabled, the facilities for them are lacking. It is essential to establish centres for physically disabled where they could learn a trade that they will be able to carry out, and stand on their own feet.

During the past two decades the proportion of mentally affected persons, have also increased substantially in the NEP. This has led to higher incidence of suicides. In the plan for a health service in the NEP, thought has to be given to the inclusion of a service component for stress related illnesses. The only related speciality

that is available in the state hospitals is the psychiatry unit. These units are also not available throughout the NEP. It's only available in Jaffna.

Psychiatric patients treated at hospitals have to return to their homes, which do not sometimes accept them. It is necessary to establish some 'half way homes' for them, which could coordinate with the family and make these unfortunate people acceptable. They could also function as a 'relief station' to those who are in distress and need someone to talk to. Of course dedicated persons who are concerned with the welfare of the mentally ill patient must man these institutions

Social Disability

The problem of the socially disabled is very serious. But what is visible is only the tip of an iceberg. The effect of this social disability will affect several generations to come.

In a recent survey of school children (Sivarajah N, 1998), 10 % of the children 5-19 years old did not have one or both parents. What is their future? Who are looking after them? Are they being denied access to education? How far have they been affected psychologically? These are questions to which we have to find answers and provide services.

The loss of parents, especially the father, will seriously affect the education of children. Even among the University students, a vast majority do not have their father. It is time we probe into this and find out the extent of the problem and what their problems are, and take action to alleviate their problems.

Another major social problem, which is emerging, is the increase in alcoholism and smoking among the population –

especially among the younger generation. This is encouraged by the state making alcohol freely available. Although the law prohibits the granting of liquor licences to liquor bars within 500 meters from a teaching institution, we have 13 licensed liquor stalls within 500 meters from the University of Jaffna. Of course the excuse is that they are not for consumption at the site. But it is an open secret that adjoining each such liquor stalls there is a place where you could consume it. In addition, it is well known that we have several illicit liquor booths around the University.

Table 12: Quantities of arrack, Beer & stout brought into Jaffna

Year	Arrack (in Litres)	Beer & Stout (in litres)
1997	206,363	30,275
1998	413,851	64,850
1999	536,882	50,743
2000	615,031	72,344

Source: Department of Excise, Jaffna

The quantity of arrack, beer & stout brought into Jaffna during the past four years is given in table 12. During the first three months of this year, 200 cases have been filed in the Jaffna, Mallakam & Point Pedro courts against sale of illicit liquor.

The population of Jaffna district is only 502,000. Based on the data available the consumption of arrack alone (excluding all other types of liquor) is 1.2 litres per head per year.

A third of the male students in the Jaffna University have taken liquor before entering the University, and another third start, while in the University. Many of them will probably continue the habit late into life. However it is enlightening to see that some medical

students are forming groups to fight against alcoholism among undergraduates.

Teenage pregnancies have also increased with the consequent health hazards to the mother and the baby. Earlier we used to see about 2-3 such teenage pregnancies per year in our clinics. But now we see 2-3 new teenage pregnancies at every clinic. Most of these pregnant mothers are from displaced families, identified late and attend clinics late in their pregnancies. Most of the husbands of the teenage mothers are themselves teenagers.

They are mostly unprepared for safe delivery and child-care.

Prostitution, which was rare in the Jaffna society, has increased into alarming proportions. Recently we had a 14 years old girl who was in her late pregnancy and allegedly engaged by the grandmother in prostitution.

Care of the Elderly

There is a major demographic change occurring in Sri Lanka, with an increase in the elderly population. This demographic change is marked in the NEP as demonstrated in the Jaffna District. The migration of youth out of the NEP has contributed very much to this demographic change.

As a result elderly persons are left behind with no one to look after him or her. The traditional extended family, which looked after, the elderly has collapsed. In our culture it was the females who looked after the elderly. With employment of women and young girls moving out to cater to the international marriage market, this support is also decreasing. Therefore it is essential that some sort of care for the elderly should be provided to the elders in the new health structure that will be implemented.

Although Institutions for the elderly are not being encouraged, this has become the only alternative in the present circumstances.

Ladies and Gentleman, I have in my address dealt with some aspects of Health Planning for the future, which I am aware is in broad terms.

It is said that the experience of the past helps to meet the needs of the present and plan for the future. I have put in my experience in the State Health Services, especially for over 9 years in Amparai, Vavuniya and Kayts and 20 years in this University, to prepare the plan. It needs much improvement. I would have achieved my objective if this address would stimulate some of you to improve this plan in order to provide a decent health service to the people of our Motherland.

I thank Prof. C Sivagnanasundram & Dr. C S Nachinarkinian for their valuable advice, and my wife Malaiaracy for the preparation and appropriate projection of the transparencies

Ladies and Gentlemen, thank you again for your patient hearing.

References

1. David Becker & Michelle Kelly, (2000). Rapid Nutrition Survey of internally displaced Children under five, in camps, Jaffna Sri Lanka. Medicins Sans Frontiers, Jaffna
2. Ines Reinhard & Daniela Kraemer, (March 2000). Working paper No 24. in Open Forum on Poverty. Documentation of a discussion held on 13th March 2000 at the German Cultural Institute, Colombo.
3. Keetheswaran A. (2000). A study of selected aspects of nutritional status of children under five years, pregnant, lactating mothers & adolescent girls in selected welfare centres in Vavuniya district. Study carried out for World Food Programme.

4. Sivarajah N. (1993). Nutritional Survey of Children in the Jaffna District. Department of Community Medicine, University of Jaffna.

5. Sivarajah N (1994). Maternal & Child Health. Paper read at the International conference on 'Victims of war in Sri Lanka – A quest for Health consensus' 17-18, September 1994, University of London Union. London.

6. Sivarajah N (1998) Survey of School aged children in the Jaffna District. Save the Children (UK) and UNICEF

7. William Hisao (2000). A preliminary assessment of Sri Lanka's Health Sector and steps forward. Harvard University in conjunction with Institute of policy studies Health policy programme, Sri Lanka.

8. Zbigniew Bankowski. A wasteful Mockery, World Health, (1987) April 1987

10

Health Related problems of Water Pollution in Jaffna

The Jaffna District depends to a great extent on its underground water resources for household use and agriculture. But this source of water, has been consistently polluted by the people leading to a situation, which has become a threat to their very existence.

The district is in the dry zone and has an average temperature range of 21 to 36 degrees Celsius and a rainfall of 848 mm. The district receives most of its rainfall during the Northeast monsoon (September to December). The rest of the year is dry with the driest period between June and August. The district may experience severe drought during this period.

Most of the rainwater reaches the sea. There are no major rivers or streams.

The pollution of the underground water occurs in the form of bacterial and chemical pollution.

Bacterial pollution leads to an increase in the incidence of water and food borne diseases such as typhoid, cholera, infective hepatitis, diarrhoeas and worm infestations.

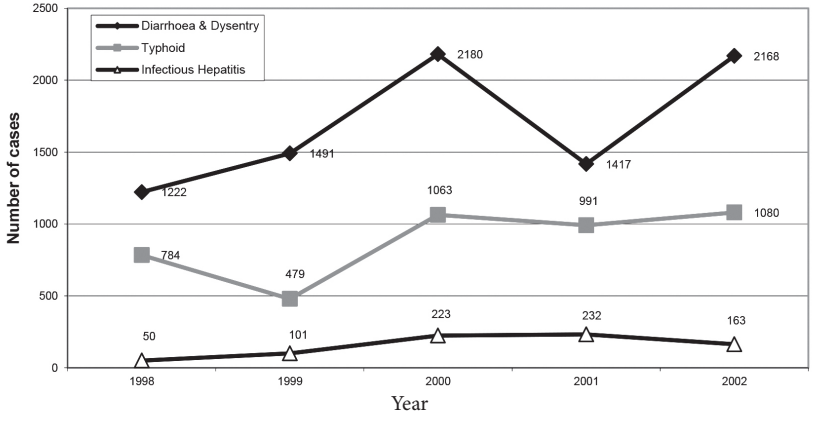
Sivarajah, N (2003). Health related problems of water pollution in Jaffna.5p.(Paper submitted to the International Workshop on "Environmental Management in North East of Sri Lanka", held on 1-4 December 2003)

Chemical pollution (excess nitrates) is associated with long-term effects like methemoglobinemia in infants (birth of 'blue babies'), Gastro-intestinal cancers etc.

Prevalence of Disease

The notified cases of some selected bowel diseases in Jaffna district are given in figure 1. It should be noted that only 10 –20% of these diseases are notified. However the important finding is that the incidence is rising.

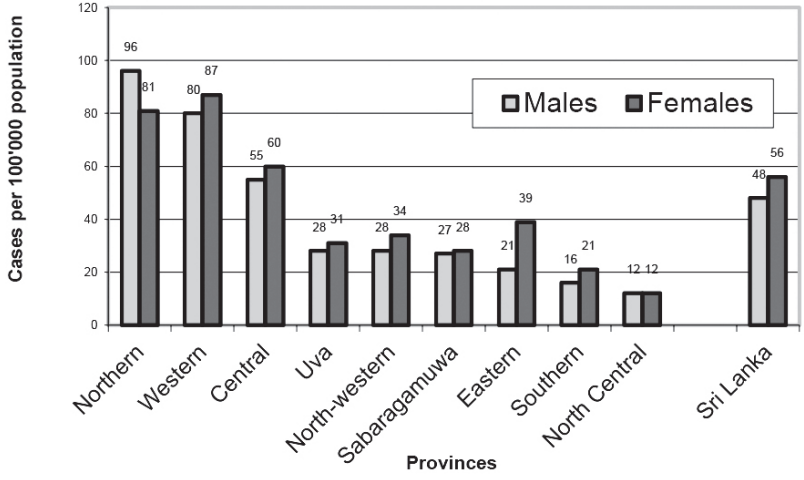
Fig 1: Incidence of water borne diseases in Jaffna District 1998 - 2002



Source: District Health Plan, 2001, 2003, Personal communication. DPDHS Jaffna

A study on cancer prevalence was carried out during a five-year period from 1973 to 1977. In this study, Prof. R G Panabokke[1] reviewed 24,029 biopsy specimens examined at 9 provincial hospitals in Sri Lanka. The incidence of cancer in the nine provinces as reported by him is given in figure 2

Fig 2 : Incidence of Cancer by Provinces in Sri Lanka



The highest incidence of cancers was in the Northern Province. The prevalence of cancer among the males in the Northern Province was double that of the Sri Lankan mean.

Taking by ethnic groups, Tamils had the highest incidence of cancer. 108 out of 100,000 Tamils were affected by cancer, while 91 Singhalese and 57 Muslims per 100,000 were affected by cancer.

The commonest sites for cancer among the Tamils were the Gastro-Intestinal tract (mouth, oesophagus & stomach), liver and breast. For every 100,000 Tamil people, 47.5 had cancer of the mouth, 37.4 cancer of the oesophagus, 19.7 breast cancer and 8 cervical cancers. This was in the 1970s.

During the recent past, the incidence of cancer appears to have increased. One third of the patients transported by the ICRC ship from Jaffna to Colombo were cancer patients. An analysis of biopsies done at the Teaching Hospital Jaffna during the period January to June 1998 showed that on an average 20 cases of cancer are detected

at the Teaching Hospital Jaffna every month. 64% of them were females and 36% were males. This excludes the several who are referred to or proceed direct to Colombo on their own

Nitrosamines are carcinogenic and known to have mutagenic and teratogenic effects. Nitrates consumed are converted to nitrosamines by the body. High nitrate content in the water could be related to the high prevalence of cancer of the gastrointestinal tract in the people of Jaffna. This aspect needs further research.

The data above point to the fact that the incidence of diseases related to polluted drinking water has been increasing in the Jaffna peninsula. This is applicable to most of the NEP.

Environmental Pollution

Every human activity on the surface pollutes the underground water

A National survey of adequate water and sanitation facilities in households was carried out in 1981 in Sri Lanka. According to the survey in the Jaffna district 45 % of the population do not have access to latrines. In the Kilinochchi, Mullaitivu and Batticaloa districts over 80% of the population do not have access to latrines. With the destruction of residences since 1980s, and the shortage of building materials to build latrines, the availability of water seal latrines would have decreased further.

It is obvious that a large percentage of the population, who do not have latrines, use the surroundings for defecation.

The lack of latrines is a major contributory cause for the high prevalence of bowel diseases. If one assumes that a person passes on an average 200 grams of stools every day, in Jaffna alone there will be 45,000 kilograms of stools deposited, on the Jaffna soil daily,

and most of it will find its way into the sources of drinking water or food.

Even the soakage pits, commonly constructed in Jaffna could be a source of contamination of underground water. One of the natural methods of removal of bacterial pollution is passage of polluted water through sand. The Jaffna soil is mainly limestone and this has several conduits. Limestone will not filter the contaminated water but in fact will allow the pollution to pass into the underground reserves through its conduits. Due to the nature of the soil in the Jaffna District a soakage pit could connect up with a conduit, which has access to a source of water, and that source of water could be easily contaminated. Several instances have been reported (Gunasekaram T.) of Ground water contamination, where toilet pits have polluted wells. Waste oil seepage from sources over 75 metres away has occurred in the Anaiccoddai area.

It is not only the ordinary people, who are responsible for this contamination of water resources. The Health Ministry is a bigger culprit. Most of the hospitals in the NEP remain the 'reservoir of bowel diseases'. None of the hospitals in the NEP have a properly functioning sewage treatment plant. The hospitals act a 'reservoirs' or 'amplifiers' of disease. They admit patients with bowel diseases (mostly the virulent forms) collect their excreta and pump them into the open without any form of treatment, thereby contaminating the environment and spreading disease.

Untreated sewage from Trincomalee Base Hospital is periodically discharged into the sea a few hundred metres away from the Trincomalee beach, which is a bathing resort (fig. 3). The sewage from the Vavuniya Base Hospital overflows into the open land at the rear of the hospital leading to stink. The effluent carrying dangerous bacteria pollute the environment and will find its way to the sources of drinking water.

Fig. 3.Trincomalee Beach with the Base Hospital in the background

The sewage treatment plant at the Kaithady Siddha hospital was damaged during the war in 2000 and to date remains in disrepair (Fig.4)

Fig. 4. Sewage treatment plant at Siddha Hospital, Kaithady in disrepair

The Jaffna Teaching hospital was pumping out untreated sewage into the open drains. Now, a treatment plant has been constructed. But regular monitoring of the effluent is not being carried out to ensure proper functioning of the treatment system and prevent pollution of the environment.

The Jaffna Municipal council presently serves a population of about 75,000. It collects 49 metric tons of garbage every day. This is dumped in four locations: Kaakkaitivu, along Navanthurai beach near Villundy, Nayanmarkaddu (Nallur), Munneswaram road (near Regal cinema) and Ceynor (Gurunagar) Some of these dumping grounds are near bathing spots. The garbage is not covered by soil as it should be done, and this leads to fly breading. In addition crows carry away infected debris and pollute the environment. Since most of the drinking water supply in Jaffna comes from open dug wells, these crows could easily pollute the water by their droppings.

Infected hospital waste

Infected hospitals waste, such as infected bandages is a severe source of pollution of the environment. These infective wastes in hospitals (including private hospitals) should be properly collected in yellow coloured bags or bins and disposed of by incineration. But in most instances they are being dumped with garbage. Usually it is the Public hospitals that should maintain the highest standards of environmental protection measures.

Chemical Pollution

Chemical pollution also takes place on a large scale.

The Vehicle service and filling stations together with the bus depot at Kondavil allow large amounts of oil to be let into the storm

water drainage system or infiltrated into the ground. The Kondavil Bus depot and two vehicle service stations are in close proximity to the source of water supply to the Jaffna town. It is not known as to what happens to the waste oil from the several hundred military vehicles stationed in the Jaffna District.

One litre of waste oil from vehicles can pollute several times its volume of water.

Another source of chemical pollution is the excessive use of insecticides and fertilizers in the area. Studies by Gunasekaram T.[2] carried out as far back as 1980 showed that the nitrate content of water was three times the maximum permissible amount of 50mg/ litre. A recent study by Harald Kraft[3] shows that the nitrate content has come down but is still above the permissible level. This could be attributed to the restriction in the transport of fertilizers to Jaffna during the past. But with the relaxation in the transport of fertilizers into Jaffna, the usage could be expected to rise. Some restrictive action needs to be taken to control the excessive use of fertilizers in order to prevent the rise in nitrates in the ground water.

Water stagnation and mosquito breeding

Another problem is water stagnation followed by mosquito breeding. Most of the storm water channels and drains have been damaged as a result of the war and subsequent neglect. Some of the storm water channels have been encroached and even buildings are built.

The blocking of these drains has lead to collection of water and mosquito breeding. The mosquito breeding could lead to spread of mosquito borne diseases like, malaria, dengue and even filariasis. Mosquito breeding has to be prevented totally around a perimeter

of at least 1 mile around every hospital. A patient with a mosquito borne disease like dengue fever could infect the mosquitoes breeding around a hospital and this could lead to the spread of infection to the community.

Recommendations

1. Establishment of a suitable **sewage disposal system in all hospitals.** The sewage and waste from hospitals are highly infectious and should not be indiscriminately discarded into the environment. Top priority should be given, to the establishment of proper sewage, liquid and solid waste management. The local authorities and Ministry of Health should closely monitor the discharge of sewage and sold and liquid waste from hospitals.

2. Development of **sewage disposal schemes for the Jaffna Municipality and all urban areas** to be implemented in stages.

   This is very essential because the soil in Jaffna has very little purification capacity and the density of the population is high especially in areas like Gurunagar, Navanthurai and Passaiyoor. The distance between the well and latrine pit in these areas is very short and it is hard to expect any purification of the sewage while passing the short distance to the well.

   The other urban towns like Point Pedro, Valvettithurai, Chavakachcheri, Chunnakam, Nelliyadi, Pandatherippu, Manipay, Chankanai & Kayts should also have sewage disposal systems.

   Construction of soakage pits for latrines should be stopped. If necessary, septic tanks should be constructed.

3. **Regular monitoring of water supplies** to hospitals and other public water supply schemes should be carried out by the Ministry of Health
4. Prevention of excessive use of **fertilizers** by restricting the transport into the peninsula
5. Establishment of a **de-nitrification plant** for the water supply to the Jaffna town.
6. **Rainwater harvesting.** Since the underground water resources are limited, it is essential that we look for alternate sources. One of the feasible sources is rainwater harvesting. More research and pilot projects are needed.
7. **Establishment of a Public Health laboratory** in Jaffna is necessary to carry out regular water analysis. The municipality and other local bodies and the Public Health sector of the Ministry of Health could utilize its services to monitor the contamination of food in food establishments and water supply schemes.
8. Establishment of a solid waste disposal system such as **compost making and incinerator** facilities at the Kakkaitivu dumping grounds
9. Repair, de-silting and reconstruction of the storm water drains and other drains should be taken up as a priority

References

1. Panabokke R G (1984). The Geographical Pathology of Malignant Tumours in Sri Lanka. Ceylon Medical Journal. 29:4; 211-15).
2. Gunasekaram T. Ground water contamination and case studies in limestone aquifer of Jaffna, Sri Lanka. Mimeograph document.
3. Harald Kraft (2002). Study on water supply Rain water harvesting, and solid waste management in Jaffna Municipal Council. Jaffna Rehabilitation Project (JRP), Sri Lanka, October 2002).

11

The State of the Health of the Tamils in North-East Srilanka

The two decades of war in Sri Lanka has seriously affected the entire country. The effect of the war has been felt more in the North-eastern part than the rest of the country. All sectors including Education, Health, Industry, Fisheries have been severely affected. The Health service is one of the sectors most affected and acutely felt by the people. The damage and destruction of the health sector has had immediate and long-term affects on the people of the Northeast.

The destruction of schools, migration of teachers and curtailment of training of paramedics (such as Field Health personnel and hospital based paramedics such as Radiographers, Laboratory technicians, Physiotherapists, pharmacists etc) for the North-east, is posing a challenge to the rehabilitation and rebuilding of the health services.

Sivarajah, N. (2004). The state of the health of the Tamils in North - East Sri Lanka. 3p. (Paper read at the conference on 'Tamils health – the diaspora's role' organized by the Centre for Health Care (Sri Lanka) and Tamils Health organization (UK), held at Surrey, UK on 9th May 2004)

Issues and problems

The health problems in the Northeast are many. The most important and what needs immediate attention to prevent a calamity could be summarised as

- Nutritional deficiency among
  - » Children – especially Protein Energy Malnutrition and Vitamin A deficiency
  - » Women – especially anaemia among young girls in the 15-19 age group and pregnant mothers.
- Lack of human resources, such as medical and supporting staff
- Damaged hospitals and other health care centres
- Lack of equipment for primary, secondary and tertiary care
- Lack of accommodation for staff – especially in peripheral institutions.

Health indicators for the Northeast when compared with the other provinces in Sri Lanka is glaring (Table 1)

Table 1: Health indicators for North-Eastern Province (NEP) compared to other provinces of Sri Lanka

Indicator	NEP	Other provinces
Households with pipe borne water supply	8.9 %	23.4 %
Households with water seal latrines	48.2 %	72.6 %
Deliveries assisted by doctor, nurse or midwife	80.6 %	96.0 %
Underweight children (under 5 years)	46.2 %	29.4 %
Children born with low birth weight	25.7 %	16.7 %

Source: Department of Census & Statistics. Sri Lanka Demographic and Health Survey 2001 for Northern and Eastern Provinces, Department of Statistics & UNICEF 2002

Note: The survey of the NEP excludes 'uncleared areas'

Complete data on Health during the two decades of war are not readily available for the entire NEP. However, some data (such as IMR & MMR) is available for this period for the Jaffna District

The infant and maternal mortality has shown an upward trend. In 1985 the IMR for Jaffna District was less than half that for the Sri Lankan average. However by 1988, the IMR overtook the national figure and still remains higher with peaks coinciding with the escalation of the war. A similar trend is seen with the MMR.

Nutritional deficiency

Nutritional deficiency among children leading to Protein Energy Malnutrition (PEM) is a major health problem, which is going to have long term effect on the community. The Sri Lanka Demographic and Health survey of the NEP (excluding the 'Uncleared areas') has shown that 46.2 % of the children under 5 years are underweight. Children with blindness probably due to Vitamin A deficiency are appearing in the Wanni district. A recent study in Jaffna has shown that 56.2 % of girls' 15-19 years in refugee camps in the Jaffna District are anaemic [1].

Human Resource

There is an acute shortage of medical and paramedical human resource. The causes for the lack of medical and paramedical human resource are different. Although training of medical human resource, proficient in Tamil was not very much affected, the retention of this trained human resource has become a problem due to lack of facilities – for professional enhancement and housing and educational facilities for the medical personnel and their families.

1. Sivarajah N, Nutritional Survey of Welfare Centres in the Jaffna District. World Food Programme, Colombo. 2001.

The cause for the shortage in paramedical manpower is mainly due to lack of facilities, during the past two decades for training of the youth from the Northeast. The reasons have been many; such as – training programmes being only in the Sinhala medium, lack of information regarding training programmes made available to the youth in the NEP, security risks in remaining in the south during the training period, delays in the processing of applications for training, schools teaching science in the NEP being closed down etc.

Availability of facilities & services are relatively good for the Amparai district. The Jaffna district has a relatively good network of institutions but the services are poor. In the Wanni districts, the Health facilities and services are very poor.

What is the role of the Diaspora?

In order to alleviate the suffering of the Tamils in the Northeast the Diaspora will have to take some meaningful steps to improve the health status of the people. This could be achieved by

- Start Therapeutic feeding Centres for malnourished children with facilities for treatment of the entire family
- Start Nutrition enhancement programmes in schools such as
  - » Mid-day meals
  - » Feeding programmes using High protein biscuits
  - » Iron therapy for all children in grade 9 and GCE (O/L)
- Establishment of Paramedical Training Centre at Kilinochchi for training of
  - » Assistant Medical Practitioners
  - » Medical Laboratory Technicians

  - » Physiotherapists
  - » Counsellors
  - » Radiographers
  - » Community Health Workers
  - » Refresher training for all paramedics
- Refresher training and employment of Community Health Workers who have been working on a voluntary basis for the past several years, in the Wanni.
- Other suggestions for better services
  - » Establishment of a Biomedical Engineering Unit for each Province
  - » Establishment of a vehicle repair unit for each Province.
  - » Establishment Primary, Secondary and Tertiary Care institutions with an effective referral system.

12

War and Health in Northern Sri Lanka: How did the People Survive?

Professor Chellathurai Sivagnanasundram
Inaugural Memorial Lecture

Vice Chancellor, the Dean Faculty of Medicine, members of the family of Professor Sivagnanasundram, friends, colleagues and students,

I thank the members of the family of the late Prof. C. Sivagnanasundram, the members of the Faculty of Medicine and the University of Jaffna for inviting me to undertake this task of delivering the Professor Chellathurai Sivagnanasundram Memorial Lecture.

I have been a close associate of Professor Sivagnansundram for over quarter of a century. He has been my boss, my teacher, a friend, an elder brother, a father, and many more.

Prof Sivagnanasundram qualified from the University of Colombo in 1955 and served in the state's Health sector, in different capacities. In 1965 he joined the Department of Community

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Sivarajah, N. (2013). War and Health in Northern Sri Lanka : How did the people Survice? In Selvarajah, N. and Chandrasekar, K (Comp.d eds.) Health in Wartime North of Sri Lanka (A Felicitation Volume in Honour of Dr.N.Sivarajah) London Ayothy Library Services & Kumaran Books House (Colombo), Pp.26-48, (Professor Chellathurai Sivagnanasundram Inaugural Memorial Lecture delivered at University of Jaffna on 10 April 2007)

Medicine, at the University of Peradeniya and rose up to the post of Associate Professor. While in Peradeniya he played a leading role in the organization and conduct of the first ever Post-Graduate course in Community Medicine in Sri Lanka, which commenced in 1972, leading to a Master of Medical Science awarded by the University of Peradeniya.

When the Jaffna Medical Faculty of the University of Jaffna was opened in 1978, he was invited to the Faculty to be its first Professor of Community Medicine, the post he held until his untimely demise.

He was the corner stone in the establishment and development of the Department of Community Medicine and the Faculty of Medicine of the University of Jaffna. He was one of those who laid the foundation stone for the medical faculty building at Kokuvil on 29th November, 1979.

He had been the Dean of the Faculty of Medicine, a member of the University Council, Acting Vice Chancellor, member & examiner at the Post-Graduate Institute of Medicine and also a member of its Board of Management

His contribution to Public Health and Community Medicine is immense. He pioneered several Research projects.

He was an international consultant to the World Health Organization and also the Ministry of Health in the Kingdom of Jordon. A guidebook for Paramedics prepared by him in 1981, has been translated into Arabic and used as a training manual for Paramedics in Jordan. As a consultant on Health Services Research, he has served in Malaysia, Bangladesh, North Korea, Mongolia, India, Myanmar and Zimbabwe.

He had been actively taking part in several Academic bodies such as the Jaffna Medical Association and the Jaffna Science Association.

He shined not only academically, but also as a writer, an actor

He was a voracious writer in Tamil and English. He started writing at the tender age of thirteen. At the age of nineteen he published his first short story "Sanchalamum Sandoshamum" in the 'Veerakesari'. Three of his novels have received the Sri Lanka Sahithya Academy Award. In 2002 he received the Governors Award (North East Province) in recognition of his contribution to modern Tamil literature. He has been the editor of 'Sai Margam' for six years since 1998.

His books in English were mainly for the medical fraternity. His book on 'Learning Research' has had two editions and is widely used across all medical schools and Post Graduate students in Sri Lanka. In addition, he has over fifty publications in National and International medical and public health related journals.

He has published seventeen books in Tamil. Four of his Tamil books are on preventive medicine for lay people, two for children, two on spirituality and one a Handbook for teachers on Sri Sathya Sai Education on Human Values.

Prof. Sivagnanasundram is a keen observer. His Tamil novels and short stories portray the characters he met in his daily activities. Each one of his short stories gives both a potent and introspective message. Most of his stories has embedded Health messages. He introduced his medical experiences into the Sri Lankan Tamil literature.

While working at Hiripitiya, he portrayed the character of the local midwife through his publication "Singalaththu Maruthuvichchi".

With his experience in managing the cholera epidemic in Jaffna, he wrote the novel 'Thangachchiamma". While working as MOH Nawalapitiya he portrayed the plight of the Estate labour through his novel "Malaikolundu"

He had a dynamic personality and was a creative genius. His extraordinary talent extended beyond his academic excellence. For several years he was the "Radio doctor" for "Radio Ceylon"

He was also an actor. He has acted in over 50 dramas. He has during a two year period (1952 – 53) acted in 25 Tamil Radio dramas. He has even acted in a lead role during the early stages of the Tamil film industry in Sri Lanka, in a Tamil film "Ponmani" directed by Dharmasena Pathiraja.

He helped in the development of several people he met in his life. I am what I am today, because of him

Prof Sivagnanasundram was very happy to teach Health to the layman and carry on with health promotion even under trying circumstances.

Even under adverse conditions he always strained to maintain high standards of Health care and education in the places he worked and in the Medical Faculty. Some of the things I propose to present are what I have learnt from him

It gives me great pleasure to deliver this inaugural Professor Chellathurai Sivagnanasundram Memorial lecture on "War and Health in Northern Sri Lanka. How did the people survive?"

I feel that it is a very suitable topic to honour the memory of a man who lived amidst the war and devoted his entire life to education and the improvement of Health in this part of the land.

Health Care in Jaffna during the 19th and 20th Centuries

The American missionaries who came to Sri Lanka in the early 19th century ended up in the Northern part of the island.

The arrival of the American missionaries in Sri Lanka marked the introduction of Allopathic medicine into the community which was engrossed in Traditional medicine. Rev Dr. John Scudder and his wife who arrived in 1819 were the earliest medical missionaries to arrive in Ceylon1. He established the first dispensary in a thatched hut in Pandatherippu on the 8th of June 1820.

Dr. Samuel Fisk Green followed Dr. Scudder and practiced allopathic medicine. He established a Medical School in Vaddukkoddai which was later shifted to Manipay. This was the first medical school in Allopathic Medicine, in Ceylon, and probably the first in South East Asia.

According to Dr. Vaithilingam alias W Chapman[2], Dr. Green had a vision to provide one doctor to every 10 000 Tamil population. He had trained 134 doctors between 1848 and 1879 including the 62 who were taught indirectly through his students when he was away in America. A massive achievement in the 19th century!

Dr Samuel Green expected his students to remain in Jaffna. But when he found that doctors who passed out of his medical school started migrating to other countries like Malaysia, Singapore and Burma, he switched the language of education into Tamil. For this purpose he learnt Tamil and wrote several Medical books in Tamil.

The Jaffna Friend in Need hospital – the fore runner to the Jaffna Teaching Hospital – from its commencement was supplied by doctors from among Dr. Green's students. According to

Dr. Chapman, in the year 1884, the hospital accommodated an indoor of 30 patients and had an outdoor of 50 patients daily.

On the first of June 1870, the Colombo medical school was opened. On the first of May 1879, the remaining seven medical students at Dr. Green's medical school were absorbed into the Colombo medical school. This ended that era of medical Education in Jaffna and the pioneer educational centre was closed down until the opening of the present Jaffna Medical Faculty one hundred years later.

During the early part of the 20th century and even up to the late 1960s, the Jaffna District had very good health care facilities available to the people. The district was studded with allopathic medical institutions managed by the state. There was also a very good private sector group of hospitals such as the Moolai Cooperative Hospital and the American mission hospitals like the Mc Leod Hospital in Inuvil and the Green Memorial Hospital in Manipay. There were also several Private Hospitals and general practitioners providing services throughout the district. Names such as Pasupathy, Vettivelu, Sambanthar, PS. Abraham, Dharmalingam, Philips, Naganathar, Gengatharan were household names.

There was also a very popular group of Traditional practitioners who practiced their profession diligently. Some well known names were Athanasiyar, Innasithamby, Sillalai pariyar, Annamalai, Packiyanathan, Ramasamy, Kasthuriyar, Pararasasingam, oddahapulam and Nayanmarkattu.

During this period, even the Jaffna Tamils who were living in the south for employment and business purposes returned to Jaffna for their confinements and for treatment. The conflict has reversed this situation.

The Conflict and Its Effect on Health

Violent armed conflicts occur all over the world. "War" is classified as a form of collective violence, but since the legal definition of war is controversial, many international instruments such as the 1949 Geneva conventions, use the term "Armed conflict". Armed conflicts have a grave impact on the health of the combatants and the public.

In modern day war a majority of those affected are the civilians.

During the post-independence era, the ethnic conflict which commenced in the 1950s, transformed itself into an armed conflict in the late seventies. Subsequently it turned into an "open war". During this span of fifty years, the health status of the North kept on gradually deteriorating.

Some milestones in the escalation of the war are

- 1958 Ethnic Riots – "Emergency 58" Riots in Colombo and suburbs with Tamil refugees migrating to the North
- 1983 Attack on military convoy in Jaffna followed by ethnic violence in Colombo and suburbs, with refugees migrating to the North
- 1987 Arrival of Indian Peace Keeping Force (IPKF)
- 1990 Departure of IPKF, eruption of 2nd Eelam war
- 1990 LTTE in control of Jaffna Peninsula (upto 1995) and A9 blocked at Elephant pass
- 1991 Operation Valampuri by Security Forces resulting in displacement of population from the Islands
- 1993 Operation Yarldevi by Security Forces

- 1995 Operation Leap forward and Riviresa by Security Forces and Mass migration from Valikamam & Vadamarachchi towards Thenmarachchi
- 1996 Displaced returned to their places (Except High security Zones)
- 2002 Peace accord signed and A 9 road opened after 12 years
- 2006 A9 closed

Conflicts can have an immediate impact on Health of the people and affect the Mortality, Morbidity and Disability in the affected population (Table 1). The WHO World report on Violence and Health[3] enumerates the direct impact of conflict on health and the possible causes.

The morbidity and mortality data for Jaffna show clearly this effect. Whenever there was escalation of the war and operations by the warring factions, the maternal and infant mortality showed rise in trends.

Table 1: The Direct Impact of Conflict on Health

(Adapted from World report on Violence and Health[3])

Health Impact	**Causes**
Increased Mortality	*Deaths due to Physical Trauma* (e.g. bombs, landmines) *Deaths due to Infectious diseases* (e.g. Diarrhoeal diseases, Respiratory tract infections *Deaths avoidable* through proper Health care (e.g. emergency intervention, preventive measures, medication).
Increased Morbidity	*Injuries* due to physical trauma (e.g. weapons, burns, poisoning) Injuries due to increased *societal violence*, including sexual violence *Infectious diseases*: water-related, (e.g. cholera, typhoid), vector borne (e.g. Malaria), and other communicable diseases (e.g. TB, AIDS) *Reproductive Health*: more stillbirths and premature births, more babies with low birth weight and more women with complicated deliveries. *Nutrition*: Acute and chronic malnutrition and deficiency disorders. *Mental Health*: Impact of psychosocial trauma on mental health (e.g. anxiety, depression, suicide)
Increased Disability	Physical Social Psychological

The World Health Organization estimates that 310,000 people died from war related injuries in 2002. Rates have been calculated as 1 per 100,000 people in high income countries and 6.2 per 100,000 people in low and middle income countries[3]

In prolonged armed conflicts there can also be a delayed and indirect impact which can affect the health system and the heath sustaining infrastructure (Table 2).

Table 2: The impact of conflict on the Health system and health-sustaining infrastructure, and its effects

(adapted from World report on Violence and Health p 227)[3]

Object of Impact	Manifestation of impact
Access to Health Services	Reduced security Financial exclusion (due to charges for services) Geographical exclusion
Health Care activity	Shift from primary care and preventive health care to specialist curative care Reduction in rural and community-based services Disrupted surveillance and health information systems Damage to vehicles and equipment Compromised public health programmes
Infrastructure	Destruction of clinics Disrupted referral systems Damage to vehicles & equipment Poor logistics & communication
Equipment & supplies	Lack of drugs Lack of maintenance Inability to maintain cold chain for vaccines
Human Resources	Insecurity pervades working environment Low morale Difficulty in retaining trained workers Disrupted training and supervision

Essential Health sustaining infrastructure	Water Sanitation Power Food security
Relief & reconstruction activities	Security limits access to certain areas Increased cost of delivering services Greater focus on single programmes with less integration between programmes Less security for relief personnel Weakened coordination & communication between agencies

The Demographic health Survey[4] carried out by the Department of Census and statistics in 2001 give health indicators which show that some of the indicators are poor for the North east compared to the rest of the country (Table 3)

Table 3:. Selected Health Indicators for NEP compared to other Provinces

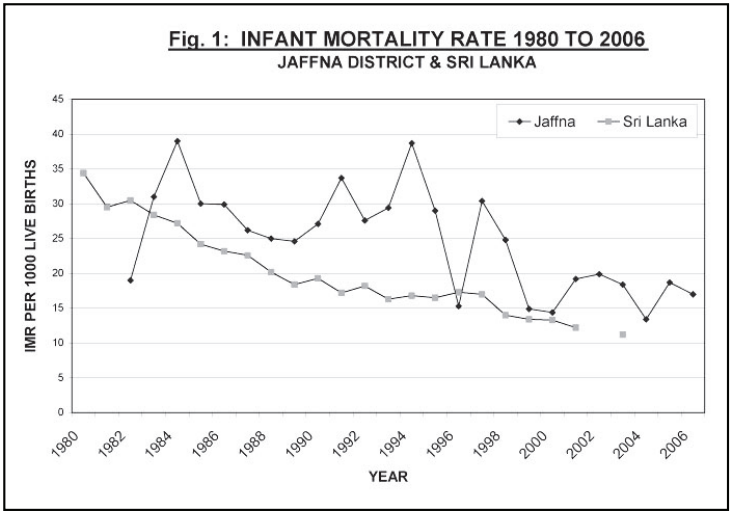
Indicator	NEP	Other Provinces
Households with Pipe borne water supply	8.9 %	23.4 %
Households with water seal latrines	48.2 %	72.6 %
Deliveries assisted by Doctor, Nurse or midwife	80.6 %	96.0 %
Under weight Children under 5 years	46.2 %	29.4 %
Children born with Low Birth weight	25.7 %	16.7 %

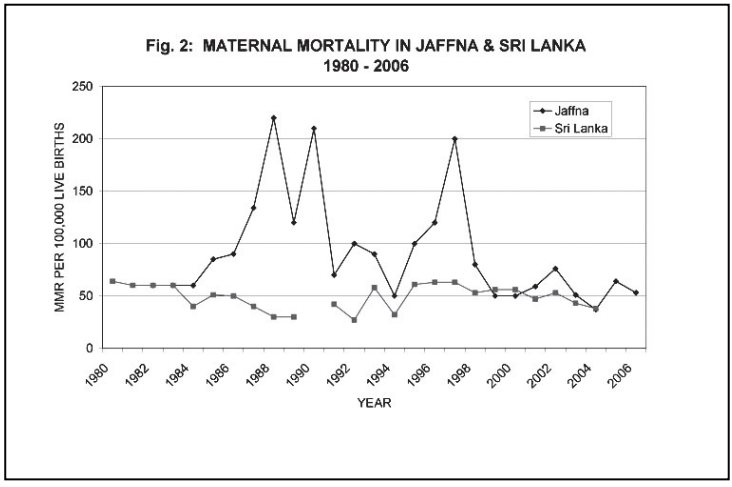
Mortality

Consequent to the shortage in Community based grass root level Health workers like PHMs and PHIs, and inadequate medical facilities, the Maternal Mortality Ratio (MMR) and Infant Mortality

Rates (IMR) have increased since the war started. The IMR for Jaffna which was less than the national figure in 1982 overtook the National figure and still remains above the national figure even after 25 years. The MMR which was same as the national figure in 1982 went up and has still not come down. During certain periods of escalation of the war, the MMR went up several folds when compared to the national figure. This is in spite of the under-reporting of infant and maternal deaths, caused by the shortage of field and hospital staff in the war affected areas.

The maximum recorded maternal deaths in recent times occurred in 1988, during the occupation by the IPKF. In that year there were 42 maternal deaths in the Jaffna district, giving a MMR of 220 per 100,000 live births. 68.3% of the maternal deaths occurred after the delivery. The causes of death of a majority of the maternal deaths were preventable. During 1988, 29.3% of mothers died of infection (Septicaemia), 24% due to post-partum haemorrhage. Most of the deaths were associated with difficulties in transport to a hospital.





Human Resource

One of the causes of the ethnic conflict was the introduction of "standardization" in education and district quota system in the late seventies and the consequent reduction of admission of Tamil students from the NEP to the Universities and other training institutes established in Southern Sri Lanka and involved in training Health Resource. With the retirement of older persons in the health service, and no one to replace them, the trained health manpower in the NEP started declining. Even the training institutes like the Nurses Training Schools which were in the North and East (which trained Nurses and Midwives) were not recruiting annually their full quota of nurses and midwives for training[5]. As a result, the Paramedical manpower gradually decreased and reached a precarious level during the last two decades. There developed an acute shortage of paramedics such as Nurses, Public Health Nurses (PHN), Public Health Inspectors (PHI), Public Health Midwives (PHM), Radiographers and Physiotherapists. Action taken during the past few years has paved the way to fill some of the vacancies of paramedics such as Family Health Workers and Public Health Inspectors.

With the rise of militancy and the consequent military presence, in the early 1980s, a sense of insecurity developed among those in the Tamil speaking areas of the North-east. Professionals who could find employment outside the conflict area started moving out. Among the first to move out were the doctors. During the conflict in the North east, a majority of Health staff (Doctors, Nurses and Technicians) left the area. In addition training of paramedics was hampered due to a variety of reasons.

Table 4: Requirement and availability of Human Resource in the Jaffna District as at 2006.

Item	Category of Staff	Approved cadre		Number available		Vacancies	
		# JTH	@Outside JTH	JTH	Outside JTH	JTH	Outside JTH
1	Consultants	32	17	13	0	19 (59%)	13 (100%)
2	General MO	179	88	114	6	65 (36%)	82 (93%)
3	AMO / RMO	-	58	-	17	41 (71%)	41 (71%)
4	Nursing officers	532	308	338	39	194 (37%)	269 (87%)
5	MLT	20	18	9	1	11 (55%)	17(94%)
6	Physiotherapists	14	3	5	0	9 (46%)	3 (100%)
7	MOH	-	11	-	1	-	10 (91%)
8	PHNS	-	15	-	1	-	14 (93%)
9	PHI	-	100	-	61	-	39 (39%)
10	PHM	-	351	-	84	-	267 (76%)

Abbreviations:

AMO / - Assistant Medical Officer
RMO - Registered Medical officer
JTH - Jaffna Teaching Hospital
MO - Medical Officer
MLT - Medical laboratory Technologist
MOH - Medical Officers of Health
PHNS - Public Health Nursing Sister
PHI - Public Health Inspector
PHM - Public Health Midwife (Family Health officer)

Source: # - Director Jaffna Teaching Hospital, Personal communication 19.01.2007

@ - Deputy Provincial Director of Health Services, Jaffna. Annual District Health Plan 2007 – Jaffna District. Planning Unit DPDHS Office Jaffna. 2006. pp 57-8

The emigration of trained health resource is not unique to Sri Lanka. In Cambodia during the uprising, out of the 487 doctors reportedly working in 1975, only 43 remained by 1979.

Presently there is an acute shortage of almost every category of Health Staff in the North East. Table: 4, gives the Human resource requirement for the State health sector in the Jaffna District. The status in the districts like Kilinochchi, Mullaitivu and parts of Mannar and Vavuniya are worse. The human resource is based on the approved cadre and this cadre itself has not been revised for several years.

Health Institutions and Access to Health Care

The Jaffna District has a fairly equitable distribution of the 42 medical institutions. But the service provided is limited, due to inadequate resources. 12% of the medical institutions are closed down and 14% are partially functioning. Even the balance that is functioning is doing so with limited resources.

Several Health Institutions were completely destroyed during the war. Some institutions are within the High security Zones and not accessible to the people. The Tellippalai District hospital which houses the Cancer treatment centre is within the High security Zone with limited access to patients and staff. No patient or staff could stay overnight at this hospital and all patients who need radiotherapy have to be transported daily going through rigorous security checks.

Military camps have been established adjoining several hospitals, especially the two major hospitals – Jaffna Teaching Hospital and Point Pedro Base Hospital causing delays and hardships to patients in accessing health care. In the east some hospitals have been completely taken over by the military.

The major hospital in the Jaffna District is the Jaffna Teaching hospital (JTH). This hospital was shifted to Manipay Green Memorial hospital for about five months in 1990 (from June 20th to November 8th).

A study[6] done in the latter half of 1990, showed that out of 224 infants who died, 119 (53.1%) died due to delay in treatment as a result of a combination of several factors such as lack of transport, curfews, aerial attacks, and non-functioning of the closest hospital.

The JTH has 1200 beds now. There are 13 consultants and 114 doctors working in this hospital whereas the cadre is 32 and 179 respectively[7]. Although the approved cadre for doctors fixed several years ago is 179, the required cadre is 341.

The peripheral hospitals in the Jaffna District have 960 beds for patients to be admitted. At present there are only 6 doctors to serve in these hospitals[8]. The Health Ministry's approved cadre of doctors needed for the peripheral hospitals are 88. Due to scarcity of Medical personal, in several instances two hospitals are looked after by one Registered Medical Officer.

The hospitals in the periphery are underutilized due to lack of human resource, resulting in overloading of the Teaching Hospital.

The Jaffna District which should have 11 Medical Officers of Health has only one retired medical officer. Most Health Units are "looked after" by Senior Public Health Inspectors, with medical officers working elsewhere "covering up".

Nutrition

According to the Sri Lanka Demographic survey of 1976, the Nutritional level of our children was better than that of most of the other districts of Sri Lanka[9]. But the Demographic and Health

Survey of 2001 conducted by the Department of Census and Statistics, indicates a very serious situation [10]. It indicates that 46.2% of children 3 – 59 months living in the North East Province are underweight compared to 29.4% of children in the similar age group in the rest of Sri Lanka. Several other studies carried out locally have also corroborated this finding.[11, 12, 13]

Not only children, women too have been found to be affected by poor nutrition. A study[14] carried out by the World Food Programme in 2001 in Welfare Centres showed that 61% of pregnant women and 56.2% of the adolescent girls were anaemic

Malaria

Malaria had been a major communicable disease in Sri Lanka during the first half of the last century. Its resurgence during the late 1960s prompted the Ministry of Health to institute intensive control measures. In spite of the control measures, malaria remained endemic in the war torn North.

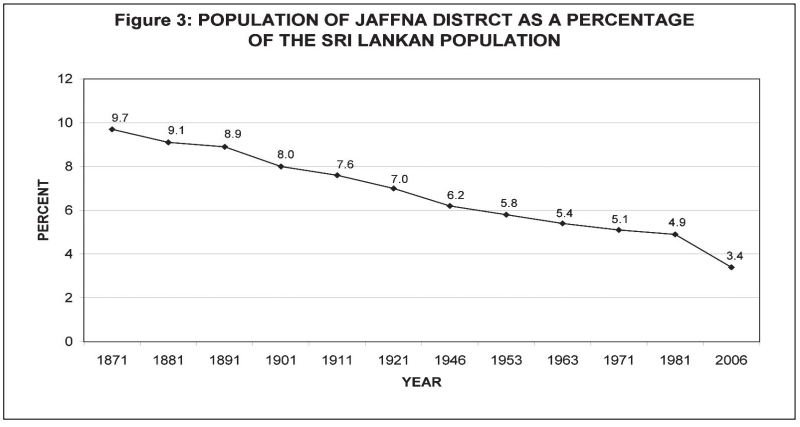
In the nineties there was high incidence of malaria in the Jaffna district. In 1998, Jaffna District had 47,802 cases of malaria giving an incidence rate of 97.9 per 1000 population. In that year, among the causes for admission to hospitals in Jaffna, malaria ranked Number one[15]. During the same year a high incidence of malaria was also recorded in Kilinochchi and Mullaitivu districts.

During 1998, 105 persons died of malaria in Sri Lanka. One hundred and two of them (97%) were from the North East province. By 2002 the incidence of malaria had dropped to negligible levels and in 2006 there were only two cases of malaria in the entire Jaffna district.

The Demographic Shift

The population of Jaffna District which was 234,497 during the first census in 1871 increased three fold to 738,791 in 1981. During the same period the Sri Lankan population increased by 7 times[16].

At the same time, taking the Jaffna District population as a percentage of the Sri Lankan population it showed a gradual decline. In 1871 the Jaffna district's population was 9.7% of the Sri Lankan Population. At the 1981 census it had dropped to 4.9% (Figure 3).



Within the next 25 years, the population decreased by a further 200,000 to the present population of 653,735 as at 31st December 2006.[17] Today the Jaffna District population is 3.4% of the Sri Lankan population.

According to the Government Agent Jaffna, 143,759 persons, (21.9%) of those living in the Jaffna District are displaced (Table 5). Most of those displaced are living with friends and relations and in 90 welfare centers. Some of them have been displaced for over 15 years.

Table 5: Population of Jaffna District as at 31.12.2006

Category	Families	Persons
Displaced before 11.08.2006	32,803	109,815
Displaced after 11.08.2006	10,480	33,944
Fishing	8,026	27,082
Vulnerable	34,297	101,959
Samurdhi	53,615	212,229
Total Relief	139,221	168,706
Above Poverty line	49,045	168,706
Total	188,266	653,735

Only 168,706 (25.8%) people in the Jaffna District have an income above the poverty level.

Amidst the war and deprivation, controls, military sanctions, restrictions on food, economic blockades, food scarcities, the population of Jaffna district and the North survived. Although the health infrastructure was severely damaged and the services were deprived of human resource, the health indicators although lower than the rest of the country is not very bad compared to countries which are at war for decades.

Although there had been several displacements and hundreds of refugee camps at different times, no major epidemics broke out among the refugee population.

How did the population survive the effects of the war?

Culture

The population of the North had always been Health conscious. Our culture and religion encouraged health habits

Health has been an important concern of most communities and health practices have been ingrained into the culture and religion. The Tamils in the North have not been an exception. As a result; health habits and concerns have been incorporated into several religious and cultural observances and practices.

Simple cultural practices such as bathing after attending funeral houses, not partaking of food for 31 days from homes where death has occurred helps in preventing the spread of infections, in cases where the deaths had occurred as a result of infectious diseases.

Water is an important source for the spread of bowel diseases. Common water sources are likely to be contaminated easily. Unlike in the south of Sri Lanka common water sources such as common wells, rivers, lakes are uncommon in the Jaffna district and most of the households in the Jaffna District have their own wells. Sharing of water outside the family circle is limited. This may be one of the reasons for the absence of major water borne epidemics in spite of the massive displacements.

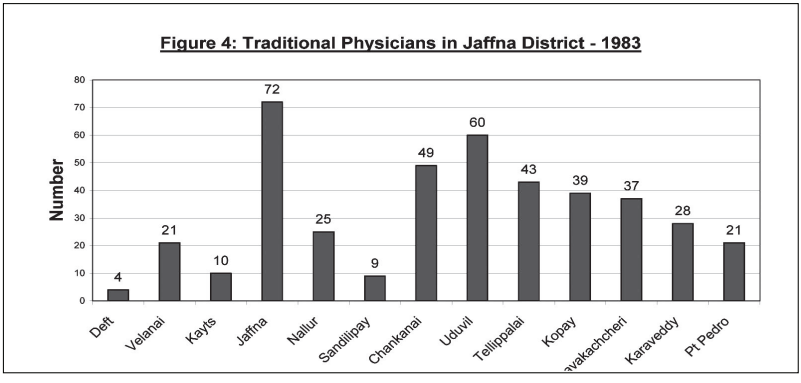
Preventive Public Health concerns such as hanging margosa leaves at the entrance to houses where infectious diseases (such as measles, chickenpox) are present, warns visitors of an infectious disease in the household and thus prevents the spread of diseases.

Human Resource for Health

A majority of the people of Jaffna resort to allopathic medicine. A sizable proportion of the people, especially in the rural areas, resort to Traditional medicine. Most of these Traditional Practitioners use allopathic drugs as well.

In addition to the Western system of medicine the indigenous system of medicine (referred to as Siddha and Ayurveda) is incorporated into the state system. The North-Eastern Provincial council (NEPC) has 16 Ayurvedic Central Dispensaries and 45 Free Ayurvedic Dispensaries.

A survey carried out by Jayanthi Jegatheesan[18] of the Department of Community Medicine, University of Jaffna, during the early 1980s found there were in Jaffna during the year 1983, 418 Physicians practicing Traditional Medicine, which amounts to about one Traditional physician for 2000 population. The distribution of these physicians in the Jaffna District is given in Figure 4.



Did these traditional physicians play a part in maintaining the health of the people? Did their use of allopathic medicine together with traditional medicine, help in the prevention of the deterioration of the health of the people?

Prof. Sivagnanasundram[19], way back in 1979, suggested liaison with Ayurvedic Physicians at basic Health care level to supplement the health manpower for community health work. Data on their contribution to health care is lacking and needs investigation.

The Role of the Paramedics

The major load of the outpatient care in the North is looked after by the Assistant Medical Officers (AMO) and the Registered Medical Officers (RMO). This category of Paramedics has been in the Health Service for the past 134 years. The AMOs were originally called Apothecaries. The training of Apothecaries started at the Medical School in Colombo in 1873 and they were serving mostly in the Estates. They underwent a training for 2 ½ - 3 years in most of the areas of medicine which is covered by the medical students but to a lesser depth. The major institute for training was the National Institute of Health Sciences (NIHS) in Kalutara. Subsequently the training was carried out at the Faculties of medicine in the Universities of Colombo, Peradeniya and Jaffna. The training in the medical faculties was stopped and the training was conducted only at the NIHS. On an average 60-70 were trained annually[20]. The last batch started traing in 1996 and completed ten years later

The original designation of "Apothecary", which was later changed to "Assistant Medical Practitioner" (AMP) is now known as "Assistant Medical Officer" (AMO). After serving in the Health Ministry for 8 years they are designated as "Registered Medical Officer" (RMO).

The Jaffna Medical Faculty started training of AMOs in 1979. This programme in Jaffna was initially coordinated by the late Prof. C Sivagnanasundram. The training programmes continued until

1990. During this period, the Jaffna Medical Faculty trained a total of 175 AMOs in six batches.

As at 31.12.2006, there were 48 RMOs working in the medical institutions in the Jaffna District. It is to be noted that 29 (60%) of them are retired and re-employed. Some of them are over 70 years old.

This category of Paramedics has contributed immensely to the prevention of the deterioration of the health status of the people.

The AMOs and RMOs have been and are even now very suitable for working in small institutions with minimum facilities. The discontinuation of this training programme in the Jaffna University is unfortunate and ill-timed, especially when there is a great human resource shortage in this part of the country. Restarting the training of this category of paramedical staff could be an alternative to the problem of Human resource shortage.

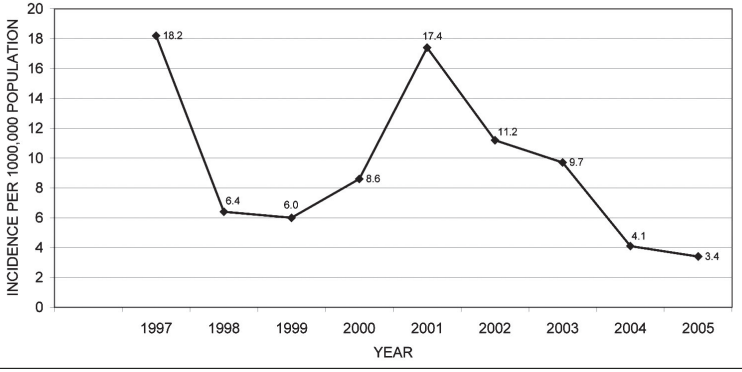
Health Care during the "Mass Exodus" from Jaffna

The Jaffna population experienced a mass internal migration during 1995. On the 30th of October 1995 an estimated 250,000 people from Valikamam and Vadamarchchi moved out in one night, in the midst of pouring rain, from the Northern to the southern part of the Jaffna District. Another 250,000 moved out during the following two days. Although there was high morbidity and mortality, associated with this migration, especially among children, elderly and the handicapped, most of these deaths were unrecorded.

The displaced people remained in Thenmarachchi (southern part of the Jaffna District) and by April 1996 a sizable proportion moved into the Wanni mainland. The balance moved back into Valikamam and Vadamarachchi where they had been living earlier.

When they returned to their homes, in the Jaffna District, there were landmines and unexploded devices in and around their houses. Nearly 500 people in the Jaffna District were killed or maimed by these landmines and other unexploded devices. In the year 1997 alone there were 91 persons affected by landmines and unexploded ordinances giving an incidence rate of 18.2 per 100,000 population and again 17.4 per 100,000 in 2001 following the Elephant pass war. In 2001, most of the casualties were from Thenmarachchi (Fig. 5).

Figure 5: INCIDENCE OF LANDMINES IN JAFFNA DISTRICT 1997 - 2005



The refugees who moved into the Wanni were badly affected. As they moved in to the Wanni, they were displaced from Kilinochchi and ended up in Puthukudiyiruppu, Mallawi, Mulangavil and Akkarayankulam. The 128-bedded hospital at Kilinochchi was completely destroyed. The entire staff working at Kilinochchi hospital moved to Mallawi and Akkarayankulam.

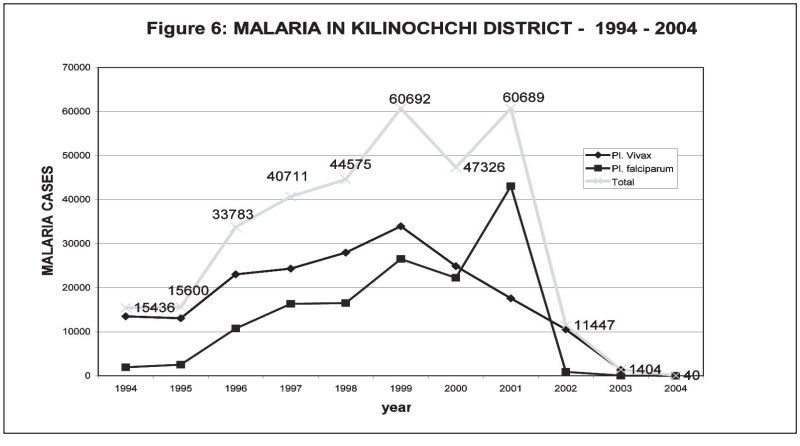
At that time there were only 5 doctors with an MBBS qualification and 10 RMOs to look after a population of around 400,000. The local doctors were in the Mallawi hospital (1), Mulangavil (1), Akkarayankulam Peripheral Unit (2) and Puthukudiyirupu (1). In

addition there were 3 expatriate doctors from the Medicins Sans Frontiers (consisting of a Surgeon, Obstetrician and a Paediatrician) who were displaced from Kilinochchi and continued to provide their services from Mallawi. The doctors from Mullaitivu hospital were already displaced to Puthukudiyiruppu Peripheral Unit.

At that time there were three areas of Medical Officers of Health functioning. They were manned by Senior Public Health Inspectors.

The gaps in the health service personnel were filled by the Tamil Eelam Health Service and the Thileepan Health Service personnel. There were also volunteer health workers with financial support from Non Governmental Organizations

During the late 1990s there was high incidence of malaria. The concerted effort of the State Health service, the Thamil Eelam Health service, the Thileepan Health service and volunteers was able to contain the epidemic of malaria. Action included a multi-pronged attack including, adult control, larval control, personal prevention, early and complete treatment (Figure 6).



During the first half of 2005, there were 16 cases of malaria in Kilinochchi and all of them were imported cases among construction workers from Batticaloa districts. Prompt intense preventive action taken by the Kilinochchi Health staff averted a calamity and local spread.

The status of the State Health Service in the "Wanni".

The term "Wanni" denotes the land area which includes the Districts of Kilinochchi, Mullaitivu and parts of the districts of Vavuniya and Mannar (Table 6).

Table 6: Composition of the "Wanni" area

District	Approximate Population as at 2004	Remarks
Kilinochchi	140 000	
Mullaitivu	130 000	
Vavuniya (Part)	13 276	Area of MOH Vavuniya North (Un-cleared area)
Mannar (Part)	28 000	Area of MOH Adampan and part of Madhu (Un-cleared area)
Total Population served	311 276	

In the Wanni, a parallel Health service exists with the State Health service. The Resource availability (Human, Financial and material) in the state sector of the Health service is poor as in other parts of the NEP. This parallel Health Service complements the services of the state health service and had been partly responsible for the prevention of deterioration of the health status of the people of the Wanni.

It is possible to see in the Wanni how Health acts as a bridge between two opposing parties. One could see the concept of "Health

as a Bridge for Peace" in force in the Wanni. The different sectors coordinate in maintaining and running the health service.

The State Health Service

This is organized as in the rest of the country. But the resources are limited. The two districts (Kilinochchi and Mullaitivu) are included in the Wanni. The Division of Vadamarchchi East (which is part of the Jaffna District), Division of Vavuniya North (which is part of Vavuniya District) and the divisions of Manthai and Vidathalthivu (which are part of Mannar District) form the "Wanni". This land area is under the control of the LTTE and named as "Uncleared area" by the Government of Sri Lanka.

The Wanni has an approximate land area of 4400 sq. km and an estimated population of 311,276

The Thamil Eelam Health Service (TEHS)

This is the main structure that controls the Health Services. A medic (Vaman) is the Director. He has undergone training locally, somewhat equivalent to an MBBS course. The course curriculum included in addition to most of the sections taught in a normal medical school plus war surgery. All of them have carried out war surgery and medical care before they completed their course. Under him are 8 District Directors one for each district of the NEP. They control and coordinate the Health activities in the districts.

Under the Director are also the following sections which cross cut all districts. The District Directors coordinate and facilitate these sections. The sections are

- Dental Services
- Indigenous Medicine

- Special Programmes
- Entomological Unit
- Environmental Unit
- Mobile Medical services, which deals with screening for diseases
- Epidemiological investigation Unit, which investigates and takes corrective measures to prevent the spread of diseases.

The annual expenditure for this service is around 5.5 million Sri Lankan Rupees. Two thirds of the funds are provided by the LTTE and the balance is collected from taxation of food handling establishments. The tax varies from Rs: 1000.00 to 500.00 per year. In return for the contribution from food handling establishments, the TEHS provides free medical examination and issue of certificates, which is a requirement to work in food handling establishments. It also provides free treatment for any infections which they could spread.

Thileepan Health Service

This is an independent wing which deals mainly with curative work. It is presently under a doctor (Elumathy) with over 20-years experience and trained in a recognized medical school. Its services are spread out in the remote areas of the NEP. The Thileepan Health Centres are in 16 locations in the North east of Sri Lanka:

Initially they were started as First Aid centres and later for emergency delivery. Its service was extended and today its services include curative work. Treatment for minor ailments is provided at these centres. Some of the centres have indoor facilities, where patients are admitted. Most of the centres are with labour room facilities to conduct deliveries.

The staff of the Theleepan Health service complements the work in some of the state Hospitals. Some of the Antenatal, Child Welfare Clinics of the state health sector are conducted by the staff of the Theleepan Health service as there is a shortage of doctors in the state health service.

The Tsunami

More recently Tsunami struck Sri Lanka. Initially, 547,509 people were displaced and 23,059 were injured. In this calamity 35,322 people were killed or were missing and 98,000 homes were destroyed[21]. The coastal region of the northeast was the hardest hit region. 35% of the coastal population of Kilinochchi, 80% in Mullaitivu & 78% in Ampara districts were hit, whereas less than 20% of the coastal population in Galle Matara and Hambantota districts were affected[22]. Tsunami had a devastating effect on the people of Jaffna District. In this district 2640 people died, 1647 were injured, 1240 reported missing and 41,000 were initially displaced.

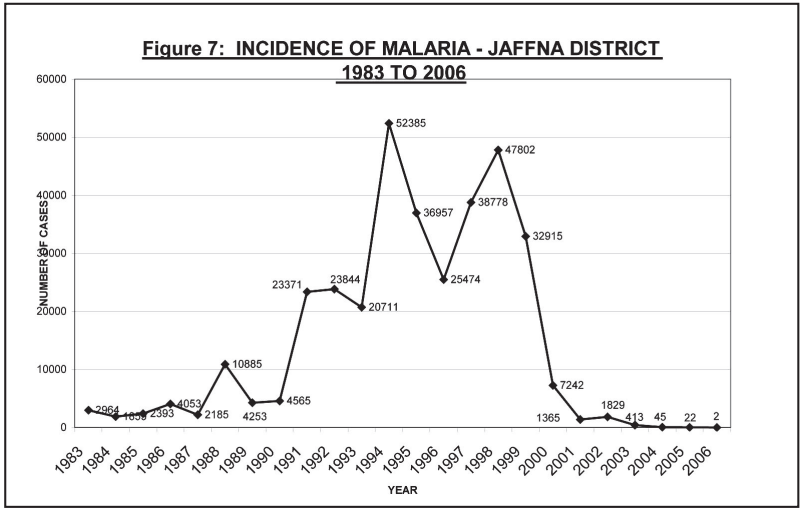
The civil society and administration rose up to the occasion and within 8 hours of the disaster a majority of the survivors in the Jaffna, Kilinochchi and Mullaitivu districts were in temporary accommodations. Probably their experience with man-made disasters during the past two decades had given them the experience to cope with the natural disaster.

A coordinating committee was organized with support from all sectors including the LTTE, and the Tsunami survivors were adequately looked after. This is one disaster situation where there was coordination between the warring parties.

Malaria Control

Although Kilinochchi district was known to be an endemic region for malaria, local transmission within the Jaffna peninsula was not common before the war. Most cases in Jaffna were imported from Kilinochchi or Vavuniya. Elephant pass was closed for traffic to and from Colombo in the early nineties. People started taking alternate routes such as crossing the lagoon initially through Uriyan and Kombadi (East of Elephant pass) and later through Kilai (West of Elephant pass). Travel along these routes necessitated overnight stay in the mainland. The anopheles mosquito being a night biter infected the travellers while in the Wanni, who brought the infection to Jaffna. Gradually, local spread increased and coupled with the embargo on insecticides, and disruption of spraying and entomological surveillance work, led to a massive increase in the incidence of malaria

The incidence of malaria rose to such high levels that the incidence in 1998 in the Jaffna district was 97 per 1000 population. (Figure 7).



In order to control this epidemic 15 persons were trained for one month in the microscopic identification of the malarial parasite. Since they could not be recruited as microscopists, they were designated "Trainee microscopists" and posted to remote Health outposts. Their appointment resulted in early diagnosis and prompt treatment. This helped in the early decline in the cases of malaria. The subsequent Ceasefire agreement and the availability of insecticides contributed to the decline in malaria incidence in Jaffna.

Immunization of Children

In spite of the war the immunization of children was not affected. The immunization coverage of EPI vaccines was mostly over 90%.

In the nineties, National Immunization Days (NID) was introduced claiming children as "zones of Peace" with a view to eradicate Polio. The 5th & 6th September and 10th & 11th of October, 1997 were observed as "days of tranquillity" and fighting between the Security Forces and LTTE was suspended[23] on these days to enable the Polio immunization of children to be carried out without interruption. Both parties to the conflict respected this arrangement.

The coverage on the NID in 1995 for the Northern Province was 73.7% for the first dose and 62.2% for the second dose. Subsequently, in spite of the war and displacement the immunization coverage increased.

Even though there were periods when electricity was not available, alternative methods were put into operation to maintain the cold chain. In Maruthankerny, the state institution (a rural Hospital) did not have electricity. The health centre of the nearest Thileepan Health Service had a Kerosine operated refrigerator in

which vaccines of the Health Ministry was stored. In immunization there was understanding between the health sector and the LTTE.

Maternal and Child care Services

Antenatal and Child care services have been satisfactorily functioning in spite of the shortage of Family Health Officers.

Registration of pregnant mothers and children has been over 90%. Attendance at Antenatal and Child Welfare clinics too, has been high. This could be attributed to the high educational level and health consciousness of the mothers who attend the clinics even though the Family Health Officers do not visit their homes.

However, the recent occurrence of several maternal deaths in Jaffna (7 in 2005 and 5 in 2006) indicates that all is not well. The war has certainly contributed in no small way towards the death of these mothers

Mental Health Services

The armed conflict in Sri Lanka which is over two decades has had devastating effects on the individuals, families and community at large. Children and adolescents have been affected disproportionately. The population has been rendered homeless, displaced several times, have had their education disrupted; their parents separated or snatched away from them and have experienced and witnessed brutality and violence. Most of the adolescents today have been born and reared amidst this war. All these have affected their mental well being and resulted in a society which is aggressive and violent.

Several studies[24] have shown that this war and disaster has affected the fundamental family and community dynamics resulting in changes at a collective level.

The implementation of several programmes by the Health Ministry and the Non-Government and UN Agencies is probably having an effect of slowing down the deterioration of the condition. The reversal will probably take more time.

Conclusion

A single reason cannot be attributed as to why our health indices especially the mortality figures remain within "reasonable" limits in spite of the long drawn out war.

Could it be due to an inherent resilience of the local community?

The health service personnel who have been in the state sector have always been conscious of their obligation to the people in the delivery of their services.

There was understanding and cooperation between the warring factions and Health Ministry staff especially in the Wanni, in implementing several Public Health Programmes at times of war and natural calamities. In the Wanni, they coordinated with staff of the Health Ministry in the implementation of Public Health programmes such as malaria control, disease surveillance and disease control. They also assisted with human resource wherever there were gaps.

The Local and International Organizations assisted in many ways. Health was on the agenda of most NGOs. Several NGOs supported the training and maintenance of grass root level workers and also in transport of drugs, equipment and nutrition supplements.

Every time calamity stuck the members of the Health profession rose up to the occasion and gave a helping hand to the affected

Because of the combined efforts of every body the people were able to survive.

Although there were bombing, shelling, displacement, restrictions and embargoes on food medicines and health equipment it should be appreciated that the population survived.

I keep always reminded of a plaque on the table of the Director, Jaffna Teaching Hospital which says:

> விழாமல் இருப்பதில் எம் மகத்துவம் இருக்கவில்லை,
> விழுகின்ற ஒவ்வொரு தடவையும் மீண்டும்
> எழுந்திருப்பதில்தான் உள்ளது.
> "Our greatness lies not in never falling down; but in rising up every time we fall"

Acknowledgements

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I wish to thank you all for your kind presence today and patient hearing.

References

1. Amirthanayagam, Mills B., "Modern Medicine and the American Ceylon Mission in the North", *The Journal of the Jaffna Clinical Society,* Vol III. December 1966. pp 8-20.
2. Ebenezer, Cutler D.D. *Life and Letters of Samuel Fisk Green MD of Green Hill.* Printed for Family Friends, 1891, p 446.

3. Etienne, G., *et al. Ed. World Report on Violence and Health,* World Health Organization, Geneva, 2002, p 222.
4. *Department of Census & Statistics. Sri Lanka Demographic and Health Survey 2001 for Northern and Eastern Provinces.* Department of Statistics and UNICEF 2002
5. Sivarajah, N., "Health Care for the Northeast Sri Lanka – Reflections for the future", Presidential Address of the Jaffna Science Association, Jaffna, April 06, 2001.
6. Sivagnanasundram, C. "Socio-cultural Challenges in Child Care" Dr. Arunasalam Sivapathasuntharam Memorial Lecture, May 12, 1992. University of Jaffna. 1992.
7. Director, Jaffna Teaching hospital, personal communication dated January 19, 2007.
8. DPDHS Jaffna, *Annual District Health Plan 2007 – Jaffna District,* DPDHS Office, Jaffna 2006.
9. Department of Census and *Statistics, Statistical Profile of Children – 1977 Sri Lanka,* Department of Census and Statistics, Colombo, 1978.
10. Department of Census and Statistics, *Sri Lanka Demographic and Health Survey 2001. Northern and Eastern Provinces,* Department of Census and Statistics and UNICEF, 2002.
11. Sivarajah, N., *Nutritional Survey of Children in Jaffna District,* Department of Community Medicine, University of Jaffna, 1993.
12. Andi, Kendle, *A Nutrition and Household Food Security Assessment – Jaffna District,* Sri Lanka, February-March 2002, Action Contre La Faim (ACF) / The European Community Humanitarian Office (ECHO), 2002.
13. David Becker, Michelle Kelly, *Rapid Nutritional Survey of Internally Displaced Children under Five, in Camps, Jaffna,* Sri Lanka, Mimeograph document, 2000.
14. Sivarajah, N., *Nutritional Survey of Welfare Centres,* Jaffna District, World Food Programme, 2001.

15. DPDHS Jaffna, *Annual District Health Plan 2002 for Jaffna District,* DPDHS Jaffna, p 18.
16. Balasundarampillai, P., Rupamoorthy, K., *Jaffna District Facts and Figures,* Teepam Institute, Jaffna, Sri Lanka, 1987.
17. District Secretariet, Jaffna, Unpublished data personal communication.
18. Jayanthi Jegatheesan, Unpublished data, Department of Community Medicine, University of Jaffna, 1987.
19. Sivagnanasundram, C., Nugegoda, D.B., "Study of Registered Ayurvedic Practitioners in Five MOH Divisions in the Kandy District – on Their Role in Maternal and Child Care and Family Planning," *Ceylon Medical Journal,* 1979, Vol 24. p 21-28.
20. Ministry of Health, *Annual Health Bulletin – 1989,* Ministry of Health, Colombo, 1990, p 111.
21. United Nations, World Health Organization & International federation of Red Cross and Red Crescent Societies, Tsunami Recovery Impact Assessment and Monitoring System, TRIAMS Worksop, Bangkok, 3-5, 2006, UN, WHO, IFRC & RCS, 2006.
22. *Rebuilding Sri Lanka: Assessment of Tsunami Recovery Implementation,* published under the direction of the Donor / Civil Society Post-Tsunami Steering Committee.
23. "Polio Truce – but will it hold this time?" Tamil Net, September 04, 1997.
24. Daya Somasundaram, *Collective Trauma: A Multi-level Social-ecological Perspective,* paper presented at the Australian Society for Psychiatric Research (ASPR) Annual Meeting, Sydney, 6-8 December, 2006.

13

Role of Public Health Sector in Sustainable Development of the Region

There are over a hundred definitions of sustainability and Sustainable development, but the best known is that of the World Commission on Environment and Development.

The World Commission on Environment and Development suggests that development is sustainable where it meets the needs of the present without compromising the ability of the future generations to meet their own needs.

Where does Public Health come into sustainable development?

Development is intimately connected to health as inadequate development leads to poverty and inappropriate development results in over-consumption. When inappropriate and inadequate development is coupled with an expanding population, it can result in severe environmental health problems in both developed and developing countries.

Improvement in Health, environment and socio economic conditions require intersectoral efforts. Such efforts, involving education, housing, public works, and community groups, are

Sivarajah, N. (2012) Role of public health sector in sustainable development of the region. In: Thabotharan, K (ed.). Proceedings of the 18th Annual sessions of the Jaffna Science Association – 2011, 18(2): 55-59. (Paper presented at the Theme seminar held on 06 April 2011, as part of the 18th Annual sessions of the Jaffna Science Association)

aimed at enabling people in their communities to ensure sustainable development.

Countries should develop plans for priority actions such as

- Meeting Primary Health care needs – especially in rural areas
- Controlling communicable diseases
- Protecting vulnerable groups
- Meeting the urban health challenges
- Reducing health risks from environmental pollution and hazards
- Preventing Non-communicable diseases through life-style modifications.

The concept of Primary Health Care (PHC) was introduced in Alma Ata in 1978 by he World Health Organization (WHO). This concept is nearer to sustainable development.

Health is both a resource for, as well as an outcome of, sustainable development. The goals of sustainable development cannot be achieved when there is a high prevalence of debilitating illnesses and poverty. Further, the health of a population cannot be maintained without a responsive health system and a healthy environment.

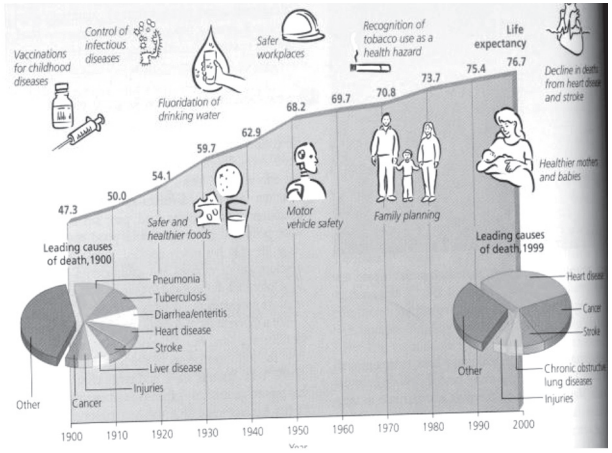
Environmental degradation, mismanagement of natural resources and unhealthy consumption patterns and lifestyles has an impact on health. Ill-health in the population in turn hampers poverty alleviation programs of the state and economic development.

Development policies and practices need to take into account current and future impacts on health and the environment. Strengthened partnerships and alliances are needed both inside and outside the health sector to address the emerging challenges.

Burden of Ill-health

The global trend in Health and related interventions during the 20th century is depicted in Fig. 1. The global expectation of life at birth in 1900 was 47.3. This rose to 74.7 by the end of the century. In 1900, the leading causes of death were dominated by Communicable diseases. This situation changed to an increase in Non-communicable diseases by the end of the century.

Fig. 1 Global Trends in Health during 1900-2000



The introduction of immunization of children, control of infectious diseases spreading across borders, fluoridation of water, safer work places, recognition of tobacco use as a health hazard and the introduction of safer and healthier tools at workplaces, motor vehicle safety, family planning, mother and childcare and other similar interventions lead to the change in pattern of disease and increasing trend in life expectancy.

The leading causes of hospitalization and deaths are given in Table 1 & 2.

The major cause of admissions to hospitals in Sri Lanka is Traumatic Injuries, while the major causes of deaths in hospitals in Sri Lanka are Non-communicable diseases.

Table: 1. Leading causes of Hospitalization in Sri Lanka - 2006

Rank order	Cause of Hospitalization	Proportionate Morbidity	Rank order	Cause of Hospitalization	Proportionate Morbidity
1	Traumatic Injuries	17.0 %	7	Diseases of the Urinary tract	3.9 %
2	Diseases of the Respiratory system	10.4 %	8	Intestinal Infectious diseases	3.8 %
3	Ill defined conditions	8.4 %	9	Diseases of the skin and subcutaneous tissues	3.6 %
4	Viral Diseases	7.3 %	10	Diseases of the Musculo skeletal system	2.6 %
5	Diseases of the Gastro-intestinal tract	5.9 %	11	Hypertensive diseases	2.6 %
6	Direct & Indirect Obstetric causes	5.1 %	Source: Annual Health Bulletin 2006 Ministry of Health, Sri Lanka – (http://www.epid.gov.lk)		

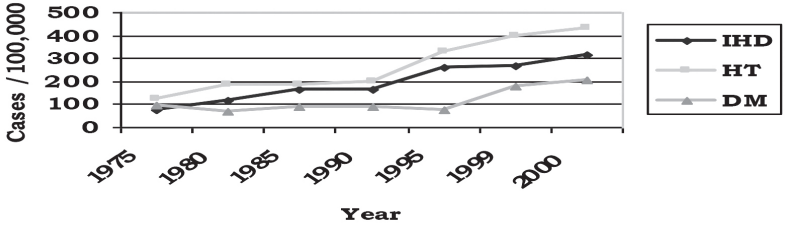
Table: 2. Leading causes of Hospital Deaths in Sri Lanka - 2006

Rank order	Cause of Hospital Death	Mortality (per 100,000 population	Rank order	Cause of Hospital Death	Mortality Per 100,000 population
1	Iscahemic Heart Disease	20.5	7	Zoonotic & other Bacterial Diseases	8.0
2	Pulmonary Heart Disease & Diseases of the Pulmonary circulation	16.5	8	Diseases of the Urinary system	7.8
3	Neoplasms	16.3	9	Symptoms, signs & abnormal clinical & Laboratory findings	7.7
4	Cerebro-vascular disease	14.5	10	Pneumonia	7.3
5	Diseases of the Respiratory system, excluding diseases of the Upper Respiratory tract	11.4	11	Traumatic Injuries	6.2
6	Diseases of the GIT	11.3	Source: Annual Health Bulletin 2006 Ministry of Health, Sri Lanka – (http://www.epid.gov.lk)		

Trends in hospitalization during the period 1975 to 2000 show an increasing hospitalization for Non communicable diseases such as

Ischemic Heart Diseases (IHD), Hypertension (HT) and Diabetes Mellitus (DM). These are life style related diseases and probably caused by life style changes. The rising trend is seen since 1990s. (Fig 2).

Fig : 2. Trends in Hospitalization of IHD, HT & DM 1975-2000 in SL



Hospital deaths due to ischemic heart diseases, which was 9.7% in 1997 increased to 12.6% in 2006.

Similarly the deaths due to neoplasm which was 6.5% in 1997 increased to 8.9% in 2006 which is a 36% increase over the figure in 1997. The trend appears to be upward.

A major concern is the increase in the admissions due to Diabetes mellitus – especially among the younger people. There had been a steep rise from the year 2000 (Table 3). It is to be noted that the data does not include the prevalence of diabetes in the Northern and Eastern provinces (as usually happens in most health data, published by the Ministry of Health)

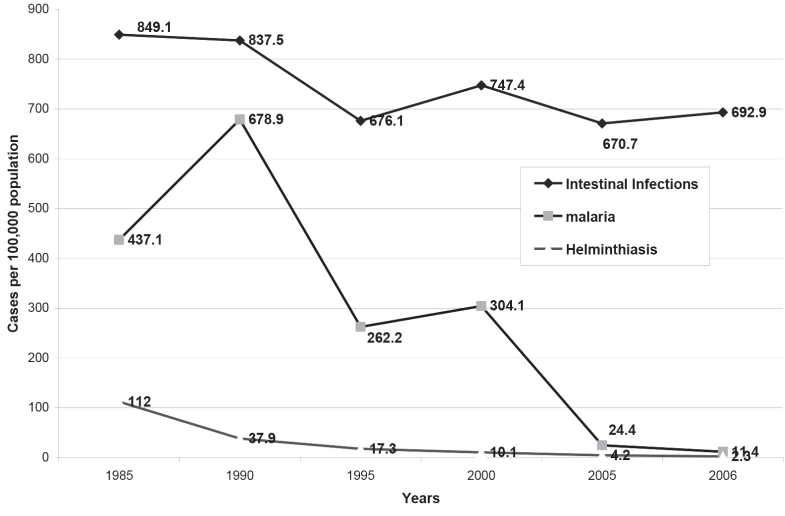
Table: 3: Hospitalization due to Diabetes Mellitus in Sri Lanka - 1985 – 2006

(Excludes data from Northern and Eastern Provinces)

Year	Per 100, 000 population
1985	86.6
1990	87.5
1995	78.6
2000	204.8
2005	265.2
2006	296.8

On the other hand, trends in hospitalization due to Communicable diseases have shown a decline. The trend in selected (Intestinal infections, Malaria & Helminthiasis) is given in to Fig.3. Intestinal infections have shown a slight decrease while malaria and helminthiasis has shown a very rapid fall between 1985 and 2005.

Fig:3. TRENDS IN HOSPITALIZATION FOR SELECTED INFECTIOUS DISEASES - 1985-2006



The trend in Jaffna District is similar to the trends in the rest of the country. However there are some regional variations contributed by the ethnic conflict which has lasted over five decades

Challenges and solutions

The number of Health institutions in the Jaffna District remains the same for the past half a century. In fact some are non-functioning or not functioning at all.

The human resources for these institutions too remain a major challenge. Although much is spoken about lack of doctors, other categories of staff (like nurses, Medical Laboratory Technologists, Physiotherapist, pharmacists and counselors) are lacking.

The Jaffna Teaching hospital needs 32 specialists and 179 medical officers. But presently there are only 20 specialists and 150 medical officers. The Pathology laboratory is functioning without a qualified pathologist for several years.

In the periphery there are 42 medical institutions under the Provincial administration. These medical institutions need 17 specialist and 121 medical officers; but there is only one specialist and 30 medical officers available. Some medical officers are looking after two or more institutions.

The Health Ministry should give priority to appointing staff to the peripheral hospitals. The Government Medical Officers Association (GMOA) insists on provision of accommodation facilities before appointing Medical officers and the state has limited provisions for construction of quarters and as a result, the people in the periphery have to suffer. They have to by-pass peripheral hospitals and come to the Jaffna Base hospital. As a result, the peripheral hospitals are underutilized and the Jaffna General

Hospital is overcrowded with patients who could be conveniently treated in the periphery if the human resource is available.

Nearly one third of the typhoid cases reported in Sri Lanka are from the Jaffna District. Food and water sanitation has to be looked into as an urgent need. A vast Majority of the population of Jaffna depend on underground water for consumption. This underground source of water is being continuously polluted by dumping the fecal matter in the soil and by improper and unsanitary disposal of refuse. The responsibility of proper disposal of human waste lies with the local authorities. This has been neglected for decades because there were no local bodies. Even though local bodies have now started functioning, local authorities give very low priority to sewage and refuse disposal.

Even most of the state and private hospitals in the Jaffna District do not have proper incineration facilities to dispose of clinical waste. These are disposed with general garbage and form a major health hazard to the community.

There is not even a single functioning sewage treatment plant in the entire Jaffna District. If only the Jaffna Municipal council and the three Urban council in Jaffna District (Chavakachcheri, Point Pedro and Valvettiturai) installs sewage treatment plants in its areas, a quarter of the population in Jaffna will have access to proper disposal of sewage. In fact no urban council should function or no pradeshya sabai should be elevated to an urban council level unless it has a functioning sewage and refuse disposal plant.

Underground water pollution is not only the result of biological pollution. Chemical pollution is also taking place due to indiscriminate use of insecticides, pesticides, chemical fertilizers and dumping of refuse and waste oil from vehicle service stations. These will have long term effect on the health of the people of Jaffna.

For proper sustainable development of the region, establishment of these facilities and strict monitoring of the services is essential.

The essential public Health Functions in sustainable development include:

1. Monitoring, evaluation and analysis of Health status
2. Surveillance, research and control of the risks and threats to Public Health
3. Health promotion
4. Social participation in health
5. Development of policies and institutional capacity for public health planning and management
6. Evaluation and promotion of equitable access to necessary healthy service
7. Human resource development and training in Public Health
8. Quality assurance in personal and population based health services
9. Research in Public Health
10. Reduction of the impact of emergencies and disasters in health

We should always remember the Native American Proverb, when considering the sustainable development of our environment

"Treat the earth well
It was not given to you by your parents
It was loaned to you by your children
We do not inherit the earth from our ancestors
We have borrowed it for our children"

Don't cry for me, I am not gone,
My soul is at rest, my heart lives on.
Light a lamp for me to see and
hold on to my memory.
But save your tears for I am still here,
by your side through the years.
Remember me with smiles not tears

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