

# **PUBLIC HEALTH DEVELOPMENT IN SRI LANKA**



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## PREFACE

The dawn of 2001 saw the end of both the second millennium and the twentieth century. This historic point in time was considered by many to be a fitting moment to delve into the past and consider the challenges of the future.

To mark this occasion, the College of Community Physicians of Sri Lanka considered it appropriate to record the important events that have taken place in the past that have influenced the development of public health in Sri Lanka, and also attempt to identify what challenges we would have to face in the future.

This was done by seeking contributions from members of our College who had worked in different fields of public health.

This supplement, in which we have included the contributions of all those who responded to our call, is the outcome of our effort.

Sri Lanka has achieved a far better health status than most countries in the developing world. The world community has held our achievements in high esteem.

This supplement is our tribute to all those dedicated men and women who contributed to the development of public health in the past, enabling Sri Lanka to accomplish this outstanding feat.

H M S S D Herath  
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## A BRIEF HISTORY OF THE DEVELOPMENT OF THE PUBLIC HEALTH SERVICES IN SRI LANKA

*H M S S D Herath*

### **The Distant Past**

It is reasonable to assume that the people of ancient Sri Lanka, who had reached a high degree of civilisation, had adopted sound, effective measures to safeguard their health. This assumption is confirmed by numerous references in the chronicles and ancient inscriptions as well as from evidence of archaeological remains. The *Mahavamsa*, the Pali chronicle of Sri Lanka, refers to the sanitary measures taken by the Sinhala kings to safeguard the health of the people. As early as the 4th century BC, in the reign of King Pandukabhaya, it records that the king appointed 500 *chandalas* (persons of low caste) to work in cleaning the streets and 200 *chandalas* for clearing the sewers. Sanitation and matters related to public safety were entrusted to an officer called the *Nagaraguttika*: this appointment was held by no less a person than the king's uncle during his reign.<sup>1</sup>

Amidst the ruins of monastic buildings— particularly in the western monasteries of Anuradhapura— are to be seen the remains of privies, urinals, and baths. Paranavitarane draws attention to the elaborate design of two such structures: one a squatting type latrine at the Abhayagiriya; and the other, a seat type toilet in the Western Porch at Polonnaruwa.<sup>2</sup> These and other findings indicate that the ancient Sinhalese were not unaware of the importance of good sanitary practices.

### **Occupation of the Island by the Portuguese, Dutch and the British**

Whilst providing an insight into the traditional health practices of the people, these findings have little bearing on the development of the existing public health services in Sri Lanka, which are based on the allopathic system of medicine introduced into the island by the successive occupation of it by the Portuguese (1505), the Dutch (1656) and the British (1796).

The Dutch built hospitals in different parts of the island and manned them with their physicians and surgeons. The Leper Asylum at Hendala (now the Leprosy Hospital) built in 1708 for the segregation of persons suffering from leprosy is a lasting monument to their contribution to public health.

The British occupied the Maritime Provinces in 1796 and gained full control of the island in 1815 with the signing of the Kandyan Convention. Small pox and cholera were major communicable diseases prevalent at that time. One of the earliest epidemics that the British had to deal with was a serious outbreak of small pox, which occurred in 1798. In 1820, a cholera epidemic in Mannar is reported to have caused the deaths of one-sixth of the population in the area.

Commencing with the establishment of the first dispensary for western medicine in Colombo for the troops, in 1800, the British established military hospitals and dispensaries in other parts of the island. The civilian population was provided medical care by the doctors in the military establishment until 1858, when the Civil Medical Department was established with a Principal Civil Medical Officer and Inspector General of Hospitals as head. Provincial Surgeons were appointed to be in charge of the administration of the provinces. By 1886, the Civil Medical Department had

established 26 Civil Hospitals, 8 District Hospitals, 6 Immigration Hospitals (for the care of immigrant Indian labourers who fell ill on the way to the plantations– see below), 14 District Outdoor Dispensaries, the Leper Asylum and a Lunatic Asylum. Public health work in their respective areas was the responsibility of officers of the Civil Medical Department, and the only type of public health work undertaken by them was the control of large-scale epidemics.<sup>3</sup>

### **Legislation enacted during the Early British Rule**

Much of the legislation enforced during the early British rule was aimed at controlling the spread of major communicable diseases prevalent in the country and preventing their introduction from outside the country. Accordingly, a proclamation in 1800 dealt with the control of small pox outbreaks, and a proclamation in 1802 dealt with establishing quarantine regulations to prevent the introduction of plague from Egypt.<sup>3</sup>

The *Public Health and Suppression of Nuisances Ordinance No. 15 of 1862* was the first legal enactment relating to public health enacted after the establishment of the Civil Medical Department. Boards of Health headed by the Government Agents were appointed to the provinces under the provisions of this Ordinance. These boards were empowered to frame regulations to inspect premises, abate nuisances, ensure sanitation and institute legal proceedings for contraventions of the law. With the enactment of the *Municipal Councils Ordinance No. 17 of 1865*, municipal councils were first established in Colombo, Kandy and Galle. Public health responsibilities of the Boards of Health were transferred to these councils. Other large towns were brought under the control of Local Boards of Health. In 1892, small towns were brought under the control of Sanitary Boards after the enactment of the *Small Towns Sanitary Ordinance of 1892*. Each Sanitary Board was headed by the Assistant Government Agent and included the senior officer of the Public Works Department, the senior officer of the Medical Department and 2–4 members nominated by the Governor. With the creation of local authorities by the enactment of ordinances relating to the establishment of municipal, urban, town and village councils, environmental health functions eventually became the responsibility of these councils; enforcement of the Ordinance and implementation of environmental health activities was carried out by local authorities under the guidance of medical officers of health and sanitary inspectors of the Department.<sup>4</sup>

*Ordinance No. 9* was enacted in 1863 to 'extend and make compulsory the practice of vaccination'. This was later repealed by the enactment of the *Vaccination Ordinance No. 20 of 1886*.<sup>3,5</sup> Provincial Surgeons were appointed Superintendents of Vaccination for their provinces. They were required to carry out a programme of vaccination in their provinces in consultation with the Government Agents by dividing each district into convenient divisions, and ensure that all adults and children over three months of age were vaccinated. Vaccination of the unvaccinated and re-vaccination of the vaccinated was performed in case of an outbreak of small pox. Trained vaccinators were employed as active agents for carrying out vaccination in the island.<sup>5</sup>

The *Quarantine and Prevention of Diseases Ordinance* was enacted in 1897 with special regulations to segregate cases of the major communicable diseases– small pox, cholera and plague.<sup>3</sup>

Small pox and cholera, which were endemic in South India, were introduced into Sri Lanka by the free entry of immigrant labour from South India in the 1820s. Until the Railway was built in 1914, immigrants had a long and arduous trek from Mannar to Matale from whence they were assigned to estates. They took the route through Medawachchiya, Anuradhapura and Dambulla to reach their destination. Some died

on the way of small pox, cholera and dysentery, which diseases caused outbreaks among the local population in the areas through which they passed. Some died of starvation. Immigrant Hospitals were set up along the route for treating the sick.<sup>4</sup>

In order to prevent the introduction of small pox, cholera and plague by the immigrant Indian labour population originating in South India, a Detention Camp for labourers was established at Tattaparai in South India, in 1899; and with the inauguration of the Indo-Ceylon Railway in 1914, another Quarantine Camp was established in Mandapam in South India. Only labourers passing through these camps were allowed entry into Ceylon. These two quarantine camps effectively prevented small pox and cholera becoming endemic in Ceylon.<sup>3,4</sup>

### **Establishment of the Sanitary Branch**

On the recommendations of a committee appointed by the colonial Governor, in 1912, the Sanitary Branch of the Civil Medical Department was established in 1913, under a Senior Sanitary Officer. Sanitary Officers, later to be designated Medical Officers of Health (MOH) were appointed and stationed mainly in the larger towns. Sanitary Inspectors, who received a training of six months, were appointed to assist them.<sup>3</sup>

### **Ankylostomiasis Campaign and the Rockefeller Foundation**

Hookworm disease was a major public health problem in the island during the early part of the twentieth century; it was believed that the immigrant Indian labourers employed in the plantations were infecting the Sinhalese in the neighbouring villages. In 1915, a campaign for the control of hookworm disease was inaugurated with the assistance of the International Health Division of the Rockefeller Foundation.<sup>3</sup> In addition to commencing mass campaigns for the treatment of infected persons, one of the chief activities of the campaign was the provision of sanitary facilities, particularly for the estate and rural areas.<sup>6</sup> The Rockefeller Foundation was to play a vital role in the early development of the public health services of Sri Lanka (see below).

### **Early Efforts at Malaria Control**

The first organised efforts to control malaria started at Kurunegala, in 1911, under Dr S.T. Gunasekera (who later became the first Ceylonese Director of Medical and Sanitary Services). Mr H.F. Carter was appointed as Malariologist in 1921 to study the malaria situation in Ceylon following which additional Anti-Malaria campaign centres were opened in Mahara, Anuradhapura and Trincomalee, in 1922 and 1923.<sup>3</sup>

### **Amalgamation of the Curative and Preventive Services**

Even though the curative and preventive services functioned under the aegis of the Civil Medical Department the preventive health services functioned, more or less, independently. In 1925, in recognition of the growing importance of public health, the curative and preventive services were brought under the control of a Director of Medical and Sanitary Services; the Principal Civil Medical Officer and Inspector General of Hospitals was appointed to this post. The Assistant Principal Civil Medical Officer was appointed as the Deputy Director of Medical and Sanitary Services and two Assistant Directors were appointed: one for medical services and the other for sanitary services. The Senior Sanitary Officer of the Sanitary Branch assumed duties as the Assistant Director of Sanitary Services in the new Department of Medical and Sanitary Services.<sup>3,4</sup>

### **Inauguration of the Health Unit System**

One of the early progressive steps taken after the establishment of the Department of Medical and Sanitary Services was the inauguration of the Health Unit system with

the establishment, in 1926, of the first Health Unit in Kalutara. This unit was established to undertake all public health work on an intensive scale in a well-demarcated area. A medical officer of health (MOH) was appointed in charge. He was assisted by public health inspectors who were responsible for environmental health and the control of communicable diseases, and public health nurses and public health midwives who were responsible for maternal and child health activities.<sup>3,6</sup>

Each Health Unit was expected to serve a population of 40–80 thousand people, and undertake the following activities:

- Carry out general and health surveys into the various problems in the area
- Collection and study vital statistics in the area
- Health education
- Investigation and control infectious diseases
- Maternal and child health
- School health work
- Rural and urban sanitation.

With the passage of time the Health Unit system was extended to cover the entire country providing a most efficient system for the delivery of preventive health care. It has remained the basis for the implementation of public health activities over the years, with little modification.

Chellappah <sup>7</sup> remarks that this was instrumental in changing the whole outlook of public health in the island.

### **Establishment of the Sanitary Engineering Division (Public Health Engineering Division)**

In 1927, the Sanitary Engineering Division of the Department was established utilising the services of the sanitary engineer of the International Health Division of the Rockefeller Foundation.<sup>3</sup> The functions of this division were: to deal with general drainage, especially malaria drainage; provision of water supplies; disposal of sewage; and the development of type plans for sanitary conveniences.<sup>13</sup> This division later developed into the Public Health Engineering Division of the Department of Health Services with five regional offices in the island. In later years officers of this division were absorbed into the Buildings Department during the re-organisation of the engineering services of the island in 1971. This division was responsible for the development of several types of sanitary latrines suitable for rural areas, which are still used by the Department of Health Services in their rural sanitation programmes.<sup>6</sup>

### **The International Health Division of the Rockefeller Foundation Ends its Services**

The International Health Division of Rockefeller Foundation concluded its mission in 1934 after having rendered invaluable service to the country in the development of the public health services. It is noteworthy that the Rockefeller Foundation played a key role in the introduction to Ceylon of the Ankylostomiasis Campaign, the Anti-Malaria Campaign, the Health Unit Organisation and the Sanitary Engineering Division (later the Public Health Engineering Division) of the Department.<sup>3</sup>

### **All-island Malaria Control and Health Scheme**

Although epidemics of malaria occurred at frequent intervals, the most devastating malaria epidemic up to that time occurred in late 1934 and continued during 1935. 1.5 million cases with some 80,000 deaths were recorded during a period of seven months!<sup>4</sup> It led to the adoption of the all-island Malaria Control and Health Scheme in 1936. Under this scheme, 55 Medical officers, designated Field Medical Officers,

were appointed to carry out preventive health work in the rural areas and to execute a programme of malaria control. At this time the cadre of medical officers carrying out preventive health work had increased to 24 Medical Officers of Health (working mainly in urban areas), 4 Medical Officers of Health for Port Health work, and 3 Inspecting Medical Officers for Estates with 2 Assistants. Thus the appointment of 55 Field Medical Officers under the Malaria Control and Health Scheme strengthened the public health services and paved the way for an extended general health programme based on the Health Unit system.<sup>3</sup>

Under this programme a five-point rural sanitation scheme was introduced which was to form the basis of the rural sanitation programme in future years; the following requirements were considered essential for a healthy rural home:

1. a well ventilated house
2. boiled, cooled water for drinking
3. a sanitary latrine
4. a manure pit
5. a kitchen garden.<sup>6</sup>

### **All Ceylon Malaria Day and the All Ceylon Health Week**

The All Ceylon Malaria Day was first celebrated in 1938 to create awareness on malaria in the community and secure their participation in control activities. This was the forerunner of the subsequent All Ceylon Health Week, which has continued to be celebrated as an annual event to this day.<sup>3</sup> A theme of current importance was selected for the Health Week, which has been celebrated in June every year; today, the theme of World Health Day is chosen as the theme for Health Week. (World Health Day was celebrated for the first time in Ceylon on the 22 July 1950<sup>3</sup>; World Health Day is now celebrated on the 7 April).

### **Introduction of Residual Spraying with DDT**

Towards the end of 1945, with the conclusion of the Second World War, residual spraying of human habitations with DDT was commenced as a control measure against the malaria vector. This activity was intensified in the hyper-endemic and endemic malarial areas towards the end of 1946. A dramatic reduction in malaria morbidity and mortality was evident by 1947, along with a phenomenal reduction in general mortality, maternal mortality and infant mortality.

As the reduction in malaria morbidity and mortality continued over the subsequent years, the Department embarked on a *malaria eradication programme* in 1953. Although the number of malaria cases declined to 17 cases in 1963, by 1967 more than half a million cases were recorded signalling the failure of the eradication programme. The time-limited *eradication programme* was replaced by a long-term *control programme* in the 1970s.<sup>8</sup>

### **Independence from Colonial Rule**

Sri Lanka regained independence from colonial rule on the 4 February 1948.

Due to the continuation of some of the welfare measures introduced immediately prior to independence, such as universal free education up to university level, food subsidies initiated during the war and free health services and the delivery of health care at the grass-roots level through the health unit network, Sri Lanka was able to attain a better health status than most countries in the region. It was possible to sustain the decline in the maternal mortality and infant mortality rates which started declining following spraying of DDT for controlling malaria.

### **The Cumpston Report and the Reorganisation of the Health Services**

Dr J.H.L. Cumpston, former Director General of Health Services of the Commonwealth of Australia, who was invited to Sri Lanka to report on the working of the medical and public health organisation in Sri Lanka, submitted his report in 1949 containing recommendations on the re-organisation of the Department of Medical and Sanitary Services amongst other things. As a consequence, the Health Services Act No. 12 which provided for the reorganisation of the Department was enacted in 1952.<sup>3</sup> The designation of the Department of Medical and Sanitary Services was changed to that of the Department of Health Services. The head of the Department was designated the Director of Health Services; the Assistant Directors of Medical Services and Sanitary Services were re-designated Deputy Directors of Medical Services and Public Health Services respectively, and a new post of Deputy Director Laboratory Services was created.<sup>9</sup>

In 1954, decentralisation of the Department of Health Services began with the creation of 15 Decentralised Units each under a Superintendent of Health Services, who was responsible for the implementation of both the curative and public health programmes in the units.

### **Population Issues and Promotion of Family Planning**

One of the concerns of government, in the 1950s, was the rapidly increasing population, a consequence of the decline in the death rate and the high birth rate, which started in the mid-forties. To contain the rapidly increasing population, the Family Planning Association (a non-governmental organisation) initiated the provision of family planning services from 1953, but government initiatives in family planning commenced only in 1958 with the establishment of a pilot project to study the prospects of introducing family planning to the general health services. Based on the experience in the project, the government decided to accept family planning as a part of the national policy. The Ministry of Health was assigned the task of providing family planning services through its MCH infrastructure. Family planning as a means for reduction of population growth proved unacceptable to certain sections of the community who attributed a sinister motive to the population activities of the government. It was only by shifting the emphasis to the benefits of family planning on maternal and child health, by integrating the Family Planning Programme with the Maternal and Child Health Programme, that success was finally achieved. A separate division designated the Maternal and Child Health Bureau, later to be re-designated the Family Health Bureau, was established in 1968 to administer the programme.<sup>8</sup>

There was a substantial slowing down of population growth following the introduction of family planning services— the annual population growth rate declined from 2.8 percent in the 1950s to 1.2 percent by 1993.<sup>10</sup> By the end of the century the population was limited to 19 million. The main reason for the decline in fertility was the increase in contraceptive use during this period, which was possible mainly through the efforts of the public health services complemented by the services provided by non-governmental organisations. Other factors that contributed to the decline in fertility were the late age of marriage and out-migration.

### **Eradication of Small pox and other Vaccine-preventable Diseases**

One of the crowning achievements of modern international public health in the twentieth century was, undoubtedly, the eradication of small pox. The last case of small pox was reported from Somalia in October 1977 and by the end of 1979 the Global Commission for the Certification of the Eradication of Smallpox certified that smallpox had been totally eradicated.

When the intensified global programme for the eradication of smallpox commenced in 1967, Sri Lanka had already achieved eradication status. This was achieved by an intensive vaccination programme backed by legislation and effective surveillance.<sup>8</sup> However, the last case of smallpox reported in Sri Lanka was that of a German lady tourist, aged 23 years, who had arrived in Kandy from Kabul in Afghanistan through Pakistan in 1972. No secondary cases were reported.<sup>11</sup>

Sri Lanka has been able to reduce the incidence of many other vaccine-preventable diseases. Immunisation with BCG Vaccine was introduced as far back as 1949, followed by immunisation with DPT Vaccine in 1961 and Oral Polio Vaccine in 1962 in response to the major epidemic that occurred in that year. Neonatal BCG vaccination was introduced in 1969. An *Expanded Programme of Immunisation* (EPI) using these vaccines was initiated in 1978 and island-wide coverage was achieved in 1979. Measles Vaccine was also introduced in 1984 and island-wide coverage achieved in 1985. The EPI was accelerated in 1985. It was possible to declare Universal Child Immunisation in December 1989, signifying that vaccine coverage exceeded 80 percent in respect of all vaccines.

With the objective of achieving total eradication of poliomyelitis by the year 2000, Sri Lanka initiated National Immunisation Days (NIDs) in 1995 and continued NIDs for three years. However, the goal of total eradication has not been achieved, as neighbouring countries in the region were unsuccessful in their attempts to achieve eradication.<sup>8</sup> Sub-national Immunisation Days are now conducted annually in areas where coverage is found to be low.

### **The Alma Ata Declaration and the Establishment of the Primary Health Care Complexes**

In 1978, the goal for the attainment of *Health for All by the Year 2000* through the Primary Health Care approach was declared at the Alma Ata Conference. Many failed to realise that Primary Health Care as enunciated by the WHO was very much part of the health strategies adopted by Sri Lanka in the development of her health system. A feature of her health policy has been an equitable distribution of health services through a well-developed public health and curative care network. Failure to realise this fact led to the introduction of a novel peripheral health care system purportedly to attain the goal of *Health for All*, through a three-tiered structure called the PHC Complex. The PHC Complex replaced the age-old Health Unit system. The post of MOH was abolished. The District Medical Officer was renamed the Divisional Health Officer (DHO) and the District Hospital was renamed the Divisional Health Centre. The functions of the MOH were assigned to the Divisional Health Officer. Central Dispensaries were renamed Sub-divisional Health Centres and the Midwife's residence and office was renamed the Gramodaya Health Centre. Thus the Public Health Services, which were up to then field-based, were effectively converted to an institution-based system. The rationale for this change was that it provided a means to develop an effective referral system for institutional care starting at the Gramodaya Health Centre and culminating at the tertiary care level. The outcome, as expected by many, was that the DHO gave priority to clinical work and failed to administer the public health services effectively.<sup>8</sup>

Towards the late 1980s it was finally agreed that the DHO system had failed, and the age-old Health Unit system was re-introduced.

### **Further Changes in Designations**

In 1983, further changes in the designations of the officials of the Ministry of Health and the Decentralised Units took place with the re-designation of the Director of

Health Services as Director General of Health Services and the Deputy Directors of Health Services as Deputy Director Generals of Health Services. The Superintendents of Health Services were re-designated Regional Directors of Health Services. Assistant Directors attached to the Ministry who should have been re-designated as Assistant Directors General of Health Services were re-designated, Directors of Health Services– this brought the Regional Directors of Health Services on par with them! The Public Health Services came under the administration of the Deputy Director General Public Health Services, who was assisted by Directors responsible for Environment and Occupational Health, Maternal and Child Health, Epidemiology and Special Campaigns, Health Education and Publicity, the National Institute of Health Sciences, the Epidemiologist and the Directors of the Special Disease Control Programmes– the Anti-Malaria Campaign, the Anti-Filariasis Campaign, the Anti-Leprosy Campaign, the Anti-Venereal Diseases Campaign and the Rabies Control Programme

The devolution of powers to the Provincial Councils, which were established in 1987, did not seriously affect the health care delivery system at the divisional level. Most public health functions were already devolved to the provinces.

### **Appointment of Divisional Directors of Health Services**

In 1992, in order to regain some of the administrative control lost to the devolved provinces, the central government appointed Divisional Secretaries to all the Administrative Districts, purportedly to deliver services to the people at the local level in direct response to their needs and implement national policies, plans, programmes and projects at divisional level. The district (regional) level administration was abolished and their functions devolved to the divisional secretariats.

To meet the health needs in the division and to function on par with the Divisional Secretaries, Medical Officers of Health were appointed Divisional Directors of Health Services (DDHS). The functions performed by the Regional Directors of Health Services were to be undertaken at divisional level by the DDHS. Thus, the administration of both the curative services and the public health services was assigned to the DDHS.

Although the District administration was abolished, the health sector retained the services of the Regional Directors of Health Services by re-designating them Deputy Provincial Directors of Health Services as transfer of functions to the divisional level had to be effected gradually.

The devolution of powers to the divisional level was intended to provide a mechanism for better integration of the preventive and curative services at the divisional level. The system was expected to afford a means for better plan formulation based on the needs of the community and effective implementation and close monitoring of activities. It was expected to result in improved coordination of health related sectors and better NGO mobilisation in the division. However, the process of devolution of functions has not occurred smoothly due to the lack of trained staff and the reluctance of district level officials to devolve their functions to the divisional level staff. With the recent appointment of additional medical officers of health and the deployment of additional trained personnel, it should now be possible to transfer functions from the regional level to the divisional level.<sup>8</sup>

### **Recent Changes in the Central Administration**

A Presidential Task Force appointed to formulate a National Health Policy in 1992 recommended in its report that the post of the Deputy Director General (Public Health

Services) should be replaced by the appointment of two Deputy Director Generals (DDG)– one for Communicable Diseases and the other for Non-communicable Diseases and Special Groups. It also recommended that Directors in charge of the following subjects should be appointed to assist the DDG Communicable Diseases: Diarrhoeal Diseases; Vector Borne Diseases and Zoonoses; Acute Respiratory Infections and Tuberculosis; Sexually Transmitted Diseases and AIDS; Environmental Health and Occupational Health; and Estate and Urban Health. Appointment of Directors in charge of the following subject areas was recommended for assisting the DDG Non-communicable Diseases: Maternal and Child Health and Family Planning (MCH and FP); School Health; Special Groups, Youth, Elderly and Disabled; Accidents, Poisoning, Addiction, Diabetes and Other Vascular Diseases; Cancer; Nutrition; Mental Health; and Oral Health. The Director Health Education and Publicity was placed under a proposed DDG Education, Training and Research and the Director Public Health Nursing Services was placed under a proposed DDG Hospitals!!<sup>12</sup>

The Sri Lanka Association of Community Medicine (now the College of Community Physicians of Sri Lanka) discussed the recommendation of the Task Force and recommended to the Ministry that the post of DDG Public Health Services should be retained intact and that careful consideration should be given to the nature of duties that would be performed by the large number of new Directors recommended by the Presidential Task Force. The Ministry of Health accepted the recommendations of the Association and maintained the *status quo*.

However, commencing in late 1997, new Directors were appointed under the DDG Public Health Services in the following subject areas: Nutrition; Young, Elderly, Displaced and Disabled; Estate and Urban Health; and Primary Health Care Services. This was followed, in 2000, by the appointment of an additional DDG Public Health Services, who was designated DDG Public Health Services 2.

The Directors working in the Public Health Services were assigned, somewhat arbitrarily, to work under the two DDGs as follows:

1. DDG Public Health Services 1– Directors in charge of the following subject areas:  
Anti-Malaria Campaign, Anti-Filariasis Campaign; Anti-Leprosy Campaign; STD/AIDS Control Programme; Rabies Control Programme; Respiratory Disease Control Programme; and Youth, Elderly, Disabled and Displaced.
2. DDG Public Health Services 2– Directors in charge of the following subject areas: MCH and FP; Health Education and Publicity; Environmental and Occupational Health; Nutrition; Primary Health Care Services.

Thus, the public health services, which functioned as an integrated entity, were bisected into two groups at central level. What repercussions this would have on the provincial and divisional levels will have to await a future evaluation. It is very likely that the delivery of public health services to the people will continue unabated through the existing well-tested, age-old Health Unit type infrastructure, which has withstood the many administrative changes that have occurred over the years.

### **Special Disease Control Programmes**

Special Campaigns have been set up over the years for the prevention of communicable diseases of importance– malaria, filariasis, sexually transmitted diseases and AIDS, leprosy, tuberculosis and rabies. In the past they have functioned as vertical campaigns with some linkages at the divisional level with the Health Unit

system. However, with the devolution of powers to the provincial councils and the subsequent establishment of a divisional level administration, many of the activities of these campaigns are being integrated with the provincial and divisional health system. The development of these specialised campaigns is dealt with in this journal by other authors.

### **Future Challenges**

The twenty-first century will witness the emergence of new challenges to the public health services. The rapidly increasing adolescent and working populations as well as the gradually increasing elderly population will demand services to meet their special needs. The decline in the child population will afford opportunities to enhance the quality of maternal and child care. Communicable diseases will continue to require control efforts and new communicable diseases are likely to emerge. Non-communicable diseases will gain increasing importance in future years.<sup>13</sup>

It is likely that with little modification in the existing health care delivery system at the grass-roots level, the public health services will be able to effectively meet these challenges.

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## **MATERNAL AND CHILD HEALTH AND FAMILY PLANNING SERVICES SERVICES IN SRI LANKA**

*J K Malini de Silva and K Wickramasuriya*

The first organised effort towards providing care and attention to the childbearing woman was made in 1879 with the establishment of the De Soysa Lying-in-Home now known as De Soysa Hospital for Women.

During the late 19<sup>th</sup> century, some of the important land marks that supported the MCH services were: the introduction of registration of births and deaths in 1887; registration of midwives in the same year (1887); inclusion of Maternal Mortality in the Registrar Generals Annual Report and the establishment of a Public Health Department in the Colombo Municipality in 1902.

Following an investigation report on the high rate of infant mortality within the Municipality, a Maternal and Child Health Department was set up in the Colombo Municipality. Six midwives were appointed in 1906 followed by two health visitors in 1913. The MCH services thereafter gradually expanded. The first antenatal clinic was started at the De Soysa Lying-in-Home in 1921.

An organised effort to provide maternal and child health services dates back to the mid 1920s with the introduction of the Health Unit System, which was to provide institutional and domiciliary, care for mothers and children. The first Health Unit was established in 1926 at Kalutara. This system was thereafter extended and by 1936, eight such health units were established.

The control measures adopted following the Malaria epidemic of 1935 led to the further expansion of the Health Unit system. Under the Malaria Control and Health Scheme, Field Medical Officers were appointed to implement the programme of preventive health and malaria control. The maternal and child health infrastructure which commenced through the Health Unit System was linked to the expanding malaria control programme. The medical officers recruited under this scheme provided MCH services at the health centres which proved to be very popular. Trained public health midwives were appointed to these Health Units. By 1950, 91 Health Units were established.

The above system provided domiciliary as well as clinic services during pregnancy, trained assistance at delivery through institutions or at home, domiciliary and clinic based services during the postnatal period and infancy. This contributed significantly to lowering of maternal and infant mortality in Sri Lanka. Maternal Mortality declined from 19.9/1000 live births in 1937 to 10.6 in 1947 and infant mortality from 170 per 1000 to 80 per 1000 live births during the same period.

Development of MCH infrastructure during the past six decades is illustrated in the above table. The number of hospitals with facilities for delivery has increased from 129 in 1941 to 452 in 1998. Similarly trained manpower for deliveries increased from 347 to 6745 during the same period.

### Expansion of MCH services - 1941 to 1996

Years	Est. Popn.	No. of Hospitals *	Number of Mat. Homes #	Number of Midwives @	Number of Health Centers
1941	6178	129	12	347	NA
1945	6650	153	34	542	503
1950	7678	263	99	1053	701
1954	8385	270	104	1854	NA
1970	12516	NA	128	2680	1122
1980	14738	357	100	3350	1344
1986	16117	389	88	4652	1778
1989	16806	400	83	5030	1880
1993	17405	410	78	6533	1905**
1996	18336	426	60	6745	1915**
1998	18774	452	69	7007	1950**

\* Includes Teaching, Provincial, Base, District, Peripheral Units and Rural Hospitals all of which have maternity unit facilities for deliveries.

# Includes Central Dispensaries and Maternity Homes. Some of these have been upgraded as Rural Hospitals.

@ Includes both institutional midwives and field midwives.

\*\* Estimated

Family Planning in Sri Lanka dates back to the early 1950s when an organized effort to introduce family planning was made in 1953 by the Family Planning Association of Sri Lanka. The Association's work was initially restricted to areas around the Colombo Municipality. Attention was mainly focussed on family welfare with a view to reducing maternal mortality, infant mortality and malnutrition. The work done by the association was given government recognition in 1954 in the form of a financial grant.

Though there was much opposition to family planning at the beginning, with time this gradually declined. Realising its importance, the government in 1958 entered into a bilateral agreement with the Royal Government of Sweden to conduct a pilot project in community family planning. The project was designed to investigate the prospects of family planning in Sri Lanka and study the attitudes of people towards family planning. The results of this project were encouraging. In the pilot areas, the crude birth rate showed a promising decline and an increasing positive attitude to family planning was seen within the community. The project also demonstrated that family planning could be successfully integrated with the existing MCH services, which were already widespread within the country.

The ten-year plan of 1959 highlighted the implications of post war increase in population growth and particularly its effect of diverting investment away from direct productive activities to social sectors. In 1960 a labour force survey conducted with the assistance of ILO showed that unemployment rate was over 10 percent. In view of the above it became evident to policy makers that the population growth rate needs to

be brought under control. Based on these experiences, the government accepted family planning as national policy in 1965. It was integrated with the already well-developed Maternal and Child health services provided through the Ministry of Health. Considering its national importance a separate division was established in 1968 within the ministry to implement the programme throughout the country. This was initially designated the *Maternal and Child Health Bureau*.

In 1970, the government made a positive statement towards family planning. It stated that “though family planning would not be a solution to the economic ills of the country, nevertheless family planning facilities should be made available on a more intensified scale.” The government’s five-year plan presented at the end of 1971 stated “family planning should be made available to all groups and not be confined to the privileged section of society”. From 1972, the family planning programme had the necessary political endorsement. The government sought the assistance of International Organisations to financially support the expansion of services within the country.

In 1972, 100 pilot projects were started, one in each MOH area, to coordinate activities such as MCH, family planning, nutrition, immunization, health education etc. Based on the experience gained from these pilot projects, the MCH/FP programme received a new dimension with a more comprehensive approach towards the family. The Bureau was re-designated the Family Health Bureau in 1972 and the programme was named the Family Health Programme.

The Family Health Bureau was made the central organisation of the Ministry of Health responsible for planning, co-ordination, direction monitoring and evaluation of the family health programme. The staff at the Family Health Bureau was strengthened to man five units, namely, Training, Health Education, Plantations, Supplies and Services and Evaluation and Research, initially.

In 1977, the government policy on population was enunciated and the subject of population was gazetted as a function of the Ministry of Plan Implementation directly under the President. In August 1978 the first Project Ministry, the Ministry of Colombo Hospitals and Family Health was established. One important function of the Ministry was to improve the delivery of maternal care, child care and family planning services in the country particularly in the rural periphery. In 1989, the Population Division together with the Population Information Centre came under the Ministry of Health and Women’s Affairs facilitating close co-ordination between the population division and the FHB.

Since the International Conference on Population and Development in Cairo in 1994, the concept of reproductive health (RH) has been introduced, addressing reproductive health issues of the adolescent and post adolescent even before they become mothers and also Women’s reproductive health conditions even after menopause. A life cycle approach to family health care has been introduced. Some of the reproductive health issues that have received emphasis in the programme are RH problems in the adolescents, early identification of reproductive organ malignancies, prevention of reproductive tract infections including sexually transmitted diseases and HIV/AIDS, concept of women’s empowerment and male involvement in RH activities.

## **Organisational structure for delivery of services**

In the implementation of the RH programme, the Family Health Bureau (FHB) play the central role maintaining a close collaboration with the National Cancer Control Programme (NCCP) and the National STD/AIDS Control Programme (NSACP). In this role, the FHB undertakes, in-service training of health personnel in RH; offers technical assistance in programme management and service delivery; conducts relevant health services research to support and strengthen service delivery; and monitors and evaluates programme performance. In addition, the Bureau is responsible for the procurement and distribution of contraceptives, equipment and other supplies needed for family planning and maternal and child health services.

In the delivery of RH services, the Ministry of Health continues to utilize its well-developed health infrastructure consisting of a network of medical institutions (larger, intermediate and smaller peripheral institutions) and Health Units. The latter are responsible for preventive and promotive aspects of health including domiciliary services in MCH and family planning. Currently there are 258 Health Unit areas with populations ranging from 40,000 to 60,000.

The Health Unit area is a clearly defined area, which is congruent with the administrative divisions of the country. Health Units are managed by Medical Officers of Health, also referred as Divisional Directors of Health Services (DDHS) and are supported by a team of public health personnel comprising one or two Public health Nursing Sisters (PHNS), 4-6 Public Health Inspectors (PHI), one or two Supervising Public Health Midwives (SPHM) and 20-25 Public Health Midwives (PHMs).

Each Health unit area is subdivided into PHM areas, which constitute the smallest working unit in the government system. Currently there are approximately 5000 PHMs in service.

The PHM is the “front line” health worker for providing domiciliary MCH/FP services in the community. Each PHM has a well-defined area consisting of a population ranging from 2000-4000. Through systematic home visits, she provides care to pregnant women, infants and pre-school children and family planning services including counselling and provision of contraceptive pills and condoms to couples in the reproductive age. She also provides necessary education and advice to adolescents on RH where needed and educates women on the importance of screening for reproductive organ malignancies thus motivating them to attend the “Well Woman Clinics” for necessary check-up. She also assist routinely at the area MCH/FP clinics which are conducted fortnightly, linking the community with the institutional health system. Her activities are supported by a system of record keeping which enables her to plan and monitor her routine activities.

The Estate sector has its own health care system and provides MCH/FP services to the estate population with necessary support from the Ministry of Health. MCH//FP services are provided by the estate health staff (Estate Medical Assistants and Estate Midwives) similar to that provided by the government sector.

Since 1989, the country's administration has been decentralised with greater devolution of administrative powers to the provinces for certain subjects/areas. Health is one of the devolved subjects and practical issues in the working relationships between the centre and the provinces are sometimes ambivalent and strained. Each Provincial Council, has a Provincial Director of Health Services (PDHS) who is responsible for total health care within the province.

The non-governmental sector too provides an important supportive function to the government programme especially in the areas of family planning, adolescent health and STD/HIV prevention. Four non-governmental organizations namely the Family Planning Association of Sri Lanka (FPASL), Population Services Lanka (PSL), Sri Lanka Association for Voluntary Surgical Contraception (SLAVSC) and Community Development Services (CDS) had been complementing the government family planning programme for 2 to 3 decades and are considered as partners in programme implementation.. Other NGOs like Sarvodaya, Mahila Samithi, CENWOR have also included IEC activities related to RH into their community development programmes, thus helping to take the concept of RH to the community.

The private sector, which includes private hospitals, nursing homes and independently practising general medical practitioners, also provide RH services of a varying degree. Although data is not available, it is known that a considerable proportion of patients with RH problems use services in the private sector.

### **Service delivery**

The government of Sri Lanka is committed to provide a comprehensive system of health care to its people. Maternal and Child Health and Family Planning forms an important component of the prevailing health care system and is an integral part of the Primary Health Care service strategy. Maternal health, Child health and Family planning are closely integrated and the following services are provided through the well developed infrastructure of the Ministry of Health, which comprise a wide network of medical institutions and health units. The Family Health programme covers a wide spectrum of services comprising:

1. Maternal care
2. Infant and Child care which provides for–
  - Immunization against six common childhood diseases,
  - Monitoring growth and development
  - Psychosocial development of the child,
  - Control of Diarrhoeal Diseases, and
  - Acute Respiratory infections
3. Nutrition of the pregnant mothers and children
4. Care of the School child
5. Adolescent health
6. Family Planning

Appropriate maternal care is provided to all pregnant women during antenatal, intranatal and postnatal periods through the health care system.

Antenatal care is provided through a network of MCH clinics conducted in medical institutions and by Public Health personnel in the field. These clinics are usually

conducted once a fortnight. In addition domiciliary care is provide by Public health Midwives through routine home visiting. Pregnant women are registered for antenatal care early and a “Pregnancy Record” is maintained to facilitate proper follow-up. “High-risk” mothers are identified and special care is provided through out pregnancy and delivery. A system of referral exists for cases that need special care.

As a routine all pregnant women are provided immunization with tetanus toxoid. This together with clean delivery practices has reduced the incidence of neo-natal tetanus dramatically enabling Sri Lanka to achieve elimination levels.

Births in government medical institutions have increased steadily during the past four decades. Easy access to institutional care and regular contact with the PHM appears to have influenced the choice in favour of institutional deliveries. Of the deliveries that take place in government institutions, almost 68% occur in larger hospitals where specialist services are available.

**Proportion of Institutional deliveries – 1960 to 1996**

Year	Total Births	% in Govt Institutions
1960	361,702	53.0
1965	396,437	62.5
1970	367,901	66.3
1975	375,857	66.8
1980	418,373	75.6
1985	389,599	75.2
1989	357,964	79.4
1995	343,224	86.8
1998	323,926	88.8

Source: Medical Statistical unit, Ministry of Health

Still 4-5 percent of deliveries receives untrained assistance. This practice is confined mainly to the remote areas of Sri Lanka and areas subjected to conflict where the services of PHMs are not readily accessible and also to the plantation sector where line room deliveries are still reported to be high. It is likely that in these areas, elderly women who had been traditionally attending to deliveries are call for assistance at the time of need.

After delivery the mother and child are followed at home by the area PHM with necessary post partum care (including advice and guidance) being provided during these visits. Routine statistics reveal that approximately 65 percent of women receive post-natal care at least once during the first ten days after delivery (Annual Family Health Report - FHB)

Infant and child health is an important component of the programme. Monitoring growth and development, immunization against the six child hood diseases, psychosocial development, control of diarrhoeal diseases and acute respiratory infections are important activities targeted towards this group. Since the commencement of the Expanded Programme of Immunisation (EPI) in 1978 much has been achieved in the field of immunization against the EPI Diseases. Measles immunization was introduced on a national scale in 1985 and currently almost 92 percent are immunized yearly.

Improving of women’s nutritional status, including that of the girl child and promotion of exclusive breast-feeding are two areas where much emphasis has been given in the recent past by the national authorities. The concept of the “Baby Friendly Hospital Initiative” has been actively promoted during the past four to five years with necessary measures taken to declare hospitals “Baby Friendly” according to the UNICEF/WHO criteria. All major hospitals and the majority of the District Hospitals have been declared “Baby Friendly”.

The National Family Planning programme adopts a ‘cafeteria approach’ to family planning. The clients are given the option of selecting a family planning method of their choice from a wide range made available through the service centers. To facilitate decision making by the client, advice and counselling on family planning methods are provided by the health workers at all levels.

In the Government programme, family planning services are provided through medical institutions and Family Planning clinics and by public health personnel engaged in field activities. Currently there are more than 875 Family Planning Clinics providing temporary modern methods of contraception and over 100 medical institutions providing sterilization services in the country. In addition to the public sector, family planning services are also provided by certain non-governmental organizations (NGOs) such as the Family Planning Association of Sri Lanka (FPASL), Population Services Lanka (PSL), Sri Lanka Association for Voluntary Surgical Contraception (SLAVSC) and Community Development Services (CDS).

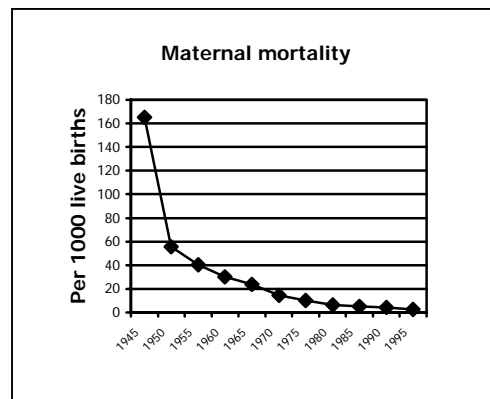
A screening programme for reproductive organ malignancies and certain other conditions have been introduced through the establishment of *Well Women’s Clinics* in Health Unit areas. Trained medical officers conduct these clinics fortnightly or monthly. Women over 35 years of age could get themselves screened for conditions like hypertension, diabetes, breast malignancies and cervical cancers. If any abnormality is detected the clients are referred to the health care system where they would receive appropriate care through the specialist clinics. The PHM of the area will thereafter follow the cases in the field accordingly.

**Achievements**

- **Reduction in maternal mortality**

Maternal mortality showed a considerable decline during the past few decades from 1650 per 100,000 in 1945 to in 58.5\* per 100,000 live births in 1998

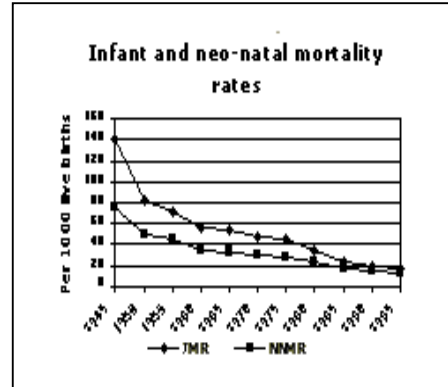
\* Source: Maternal Death Investigation System - FHB



- ***A reduction in neonatal and infant mortality***

Infant mortality declined from 140 per 1000 live births in 1945 to 17.3 per 1000 in 1996. Similarly neo-natal mortality has declined from 75.5 per 1000 live births to 12.9 per 1000 in 1996.

Source : Registrar General's Department



- ***Reduction in peri-natal mortality***

Perinatal mortality has declined from 77 in mid 1940's to 66 in 1966. Since official RG data are not available, recent studies have shown that perinatal mortality is currently around 32\* per 1000 births

\*Source: Study on Low Birth Weight and Neonatal Morbidity and Mortality, FHB, 1988.

- ***Reduction child mortality***

Child mortality has declined considerably during the past few decades. Child Mortality Rate has declined from 24.7 per 1000 children under 5 years in 1950, to 2.8 per 1000 in 1981 and 0.9 per 1000 in 1996

- ***High coverage of Antenatal care – domiciliary and clinic***

More than 98 percent of pregnant women received antenatal care during pregnancy (DHS - 1993). More than 95 percent of deliveries receive trained assistance at delivery;

- ***High proportion of deliveries by trained personnel***

More than 94% receive trained assistance at the time of delivery (DHS 93). During 1998, 88.8 percent of births were in government hospitals.

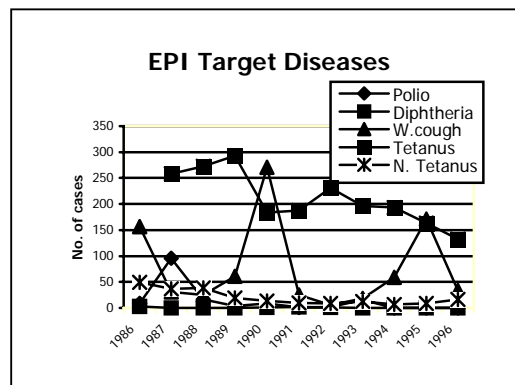
- ***High level of infant immunisation***

Sri Lanka achieved Universal Immunization status in 1989, where over 80 percent of infants were immunized with all six antigens.

- ***Marked decrease of EPI target diseases***

Morbidity due to immunizable diseases showed a marked decline since the introduction of the EPI programme.

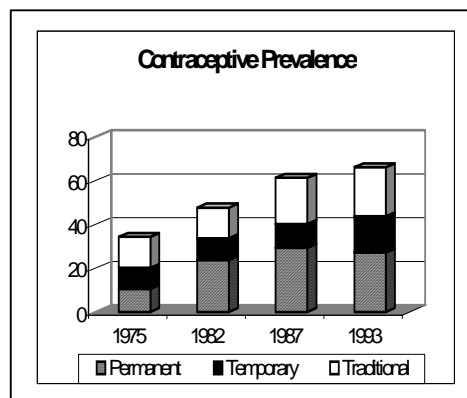
Confirmed cases of diphtheria have not been reported during the period 1993 to 1998, while confirmed cases of polio had not been reported during the period 1994 to 1998.



Neonatal tetanus too has decreased remarkably reaching almost elimination levels.

- ***High contraceptive prevalence with a rate of more than 66 percent.***

Contraceptive prevalence has increased from 34% in 1975 (WFS) to 66.1% in 1993 (DHS 93) with 44% using modern methods of contraception.



- ***Marked reduction in fertility almost reaching replacement level.***

Fertility has declined in all age groups reaching a Total Fertility Rate around 2.1. The crude birth rate declined from 38 per 1000 population in 1946 to 17.3 per 1000 in 1998.

Although Sri Lanka has achieved effective service coverage in MCH/FP, the quality of service delivery needs further improvement to face the challenges of the new millennium.

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## DEVELOPMENT OF EPIDEMIOLOGICAL SERVICES IN SRI LANKA AND FUTURE CHALLENGES

*T A Kulatilaka and Wimal S Jayakuru*

### **Introduction**

Epidemiology is the study of the distribution and determinants of health-related states or events in populations to control health problems.<sup>1</sup> This discipline deals with all aspects of health. While originally it dealt with infectious diseases, which led to the association with the term “epidemic”, modern epidemiology is a wide science, covering the study not only of all diseases but of all health events in a population, as evidenced by this definition.

### **Past developments**

The public health services in Sri Lanka commenced with the establishment of the Sanitary Branch of the Civil Medical Department under a Sanitary Commissioner in 1913.<sup>2</sup> Sanitary Officers (later designated Field Medical Officers /Medical Officers of Health) were appointed to large “district” areas to carry out health work, which included some epidemiological activities like control of infectious diseases and epidemics. Whilst the general public health activities became the responsibility of Medical Officers of Health (MOHs), specialized campaigns for the control of diseases of major public health importance were established from time to time. The Anti-Malaria Campaign was established in 1922 and the Anti-Tuberculosis Campaign (now Respiratory Disease Control Programme) was established in 1947.<sup>3</sup>

The Epidemiological Unit was established in 1959 with assistance from the World Health Organization (WHO) to strengthen the surveillance of communicable diseases. Initially, the unit functioned with a WHO consultant and a national counterpart, who, after further training in epidemiology, was appointed as the Epidemiologist of the Department of Health Services in 1961. Prior to this, the functions of epidemiological surveillance were under a Senior Medical Officer (Epidemiology) in the Department of Health Services. From its inception, the Epidemiological Unit worked very closely with the Public Health Veterinary Officer (now Director, Public Health Veterinary Services) and the Medical Statistician– all located at Chelsea Gardens, Colombo 3. In the early 1970s, all three units were shifted to the Anti-Tuberculosis Campaign building at Deans Road, presently occupied by the Ministry of Health. By 1967, the Unit had expanded and two Assistant Epidemiologists were appointed following specialized training in epidemiology.<sup>4</sup>

In 1970, the first two Regional Epidemiologists were appointed to the health regions of Kalutara and Kurunegala. These officers had undergone specialized training in epidemiology.

About this time, it was planned to appoint Regional Epidemiologists, on a phased basis, each to cover one or two health regions. This was based on the availability of twelve-month fellowships funded by WHO for postgraduate training (DPH/MPH) with special training in epidemiology. Due to the shortage of medical officers of health (MOHs) in the public health services, the trained medical officers were appointed as MOHs and not as Regional Epidemiologists. With the introduction of Cholera El Tor in late 1973, and the decision to strengthen the epidemiological

services, a Regional Epidemiologist was appointed in 1974 to cover the two northern districts (Jaffna and Vavuniya), while an Assistant Epidemiologist from the Epidemiology Unit covered the Colombo district. In addition to these three districts, Kurunegala and Kandy already had Regional Epidemiologists. In the same year, the services were further expanded by one of the Assistant Epidemiologists being assigned non-communicable disease epidemiology. With the establishment of a separate Cancer Control Programme in 1980, this officer was appointed as its first Director. The Cancer Control Programme functioned under a separate Unit in the Ministry of Health. A Public Health Bacteriologist with postgraduate qualifications in bacteriology, as well as in public health was appointed to the Unit in 1975. This officer, who was attached to the Infectious Diseases Hospital and the Lady Ridgeway Children's Hospital, worked as a member of the epidemiological team for outbreak investigations as well as for special studies. This post was not filled after the retirement of the officer in the early eighties.

In 1986 the Epidemiology Unit was shifted to the more spacious building at 231, De Saram Place, Colombo 10. In 1995, the cadre of the Epidemiology Unit was revised and the total cadre of medical officers was increased to 13 (2 Senior Administrative MOs, 8 Specialists and 3 Grade Medical Officers). From 1996, steps have been taken to fill the vacancies. However, due to the non-availability of qualified medical specialists in this field several vacancies continue to exist. With the devolution of administrative powers to the provincial councils in 1987 it was planned to appoint a Provincial Epidemiologist to cover each province, on a phased basis.

In 1960, the Epidemiology Unit commenced the publication of the Quarterly Epidemiological Bulletin. In the latter part of 1973, the Unit commenced publication of a Weekly Epidemiological Report with the objective of providing information on the cholera epidemic. This was later modified to provide a statement on notifiable diseases based on information received from all Medical Officers of Health in the Weekly Report of Communicable Diseases. This system of a quick feedback, which was initially limited to medical officers in the Ministry of Health, was gradually extended to others such as general practitioners, academic staff members of Universities.<sup>4</sup>

In 1987, the Epidemiology Unit commenced the computerization of surveillance data with the assistance of WHO. The computer section was established in 1987 with the appointment of a Computer Programmer/System Analyst and Data Entry Operators. The necessary software and hardware were obtained with the assistance of WHO. The present computer system in the Epidemiology Unit has a file server with fifteen workstations. All medical officers have direct access to surveillance data in the file server. The Epidemiology Unit also has e-mail and Internet facilities.

## **Achievements**

### ***Resource Development***

During the last two decades policy makers have given necessary support for the development of epidemiological services in the country. Additional resources to develop the services at the central level and regional level by way of human resources, material and funds have been provided. The regional epidemiological services have been strengthened and at present 17 Regional Epidemiologists are in place.

### ***Disease Surveillance***

Disease surveillance activities especially in respect of notifiable diseases have been improved. A list of notifiable diseases was first gazetted in the Ceylon Gazette in August 1925 under the Quarantine and Prevention of Disease Ordinance of 1897, in order to take prompt action for the prevention and control of communicable diseases. This was subsequently amended in 1947.<sup>5</sup> This list has been revised from time to time in order to include new diseases, which needed additional monitoring for prevention and control activities. At present the Medical Officers of Health send weekly returns of communicable diseases to the Epidemiology Unit. With the computerization of disease surveillance data at the Epidemiological Unit it is possible to monitor the disease trends and recognize outbreaks early. The establishment of an early warning system and rapid response teams at central and regional levels has helped to control disease outbreaks early.<sup>6</sup>

### ***Advisory Committee on Communicable Diseases***

In mid-nineteen sixties a multidisciplinary Advisory Committee on Communicable Diseases was established under the chairmanship of the Director General of Health Services to review the situation of communicable diseases in the country regularly, and to make policy decisions on prevention and control measures. Members of this committee serve as experts in the rapid response team for the management of national level disease outbreaks/epidemics.

The WHO continues to support the manpower development programme in the epidemiological services by arranging placements for training abroad and awarding fellowships for epidemiologists.

National and international organizations like the World Health Organization (WHO), the United Nations Children's Fund (UNICEF), the Japanese International Co-operation Agency (JICA) and the Rotary International have provided necessary assistance to carry out special disease control programmes (in polio, dengue, diarrhoea and in cholera).

### **Prevention and control of major communicable diseases**

#### ***Smallpox***

Smallpox epidemics occurred in Sri Lanka with considerable frequency during the past few centuries. The surveillance and vaccination of the at risk population were the two main strategies used to eradicate this disease. Vaccination against smallpox was introduced to Sri Lanka in 1802 and in 1886 it was re-introduced under the Vaccination Ordinance. The last definitive case of smallpox in Sri Lanka was reported in 1967.<sup>3</sup>

#### ***Cholera***

Cholera was rarely seen in Sri Lanka in the period immediately following independence. After a cholera free period of 22 years from 1951, the first major outbreak of cholera El Tor was reported in Sri Lanka in 1973.<sup>3</sup> A fresh outbreak was reported in the Puttalam District in 1997 which spread to other districts, but the outbreak was controlled effectively.

#### ***Other Diarrhoeal Diseases***

Over the years the death rate for diarrhoeal diseases has decreased markedly. Much of this reduction can be attributed to the successful implementation of oral rehydration therapy "Jeevanee" from 1983/84 as treatment for watery diarrhoea throughout the

country. The incidence of dysentery and other diarrhoeal diseases has declined during the last few years due to improved sanitation, better personal hygiene and reduction of other risk factors. The morbidity and mortality trends and case fatality in diarrhoea over the years is shown in Figure 1.

### ***Dengue***

Dengue fever has been endemic in Sri Lanka from the beginning of the century. Serological and virological evidence to this effect was first recorded in 1960.<sup>7</sup> The virus was first isolated in Sri Lanka in 1965 at the Medical Research Institute (MRI). In 1989, there was a major outbreak of Dengue Haemorrhagic Fever (DHF) with 203 clinically diagnosed cases and 20 deaths. In 1990, the number rose sharply to 1,350. During the last few years over 1,000 suspected cases of DHF are reported every year. With the establishment of an early warning system it is now possible to avert large outbreaks. In addition the case fatality due to dengue has been reduced to less than 1 percent by proper management of cases.

### ***Japanese Encephalitis (JE)***

The JE virus was first isolated in Sri Lanka in 1968 by the MRI and since then cases have been reported from different parts of the country.<sup>8</sup> The first major outbreak was reported in 1985 in the Anuradhapura district. In 1987, 766 cases of Japanese Encephalitis (JE) were reported with 38 deaths. Later it spread to other areas in the North Central province, North Western province, Western province and Southern province. Immunization of children aged 1-10 years against JE commenced in 1988 as the main strategy to control the disease. The Department of Health Services spends over 100 million Sri Lankan rupees each year to import JE vaccine and administer over 800,000 doses to children annually. In 1999, only 100 cases of Japanese Encephalitis were reported in Sri Lanka.

### ***Vaccine-preventable diseases***

Sri Lanka has a history of immunization against vaccine-preventable diseases that dates back to the nineteenth century. The success story of immunization in Sri Lanka started in 1886 and continues to this day.<sup>3</sup>

The history of immunization activities over the years is given below:

<b>Year</b>	<b>Milestone</b>
1886	Vaccination against smallpox introduced under the Vaccination Ordinance
1949	BCG vaccination introduced against tuberculosis
1961	'Triple' vaccination introduced against diphtheria, whooping cough and tetanus
1962	Oral Polio Vaccine introduced
1963	BCG vaccination of new born introduced
1969	Tetanus Toxoid administration to pregnant mothers introduced
1978	Launching of the Expanded Programme on Immunization (EPI)
1981	Revision of the immunization schedule and the introduction of a modified list of contraindications
1984	Measles vaccination introduced

1985	Strengthening of cold chain and logistics in EPI
1989/1990	Achievement of Universal Childhood Immunization (UCI) with 80% coverage of all infants with the vaccines in the EPI.
1991	Revision of Tetanus Toxoid schedule
1995	First National Immunization Days (NIDs) 4 <sup>th</sup> November 1995 and 9 <sup>th</sup> December 1995
1996	Immunization against Rubella commenced in August 1996
2000/2001	Revision of immunization schedule and introduction of Measles Rubella vaccine.

It is interesting to note that all activities leading to the present high level of immunization commenced after the declaration of independence. A streamlined, organized programme was set into motion only in 1978 with the introduction of the Expanded Programme on Immunization (EPI). This programme has received assistance from the World Health Organization and the United Nations Children's Fund, as well as from other non-governmental organizations. With the increase in the immunization coverage of infants and pregnant mothers over the years there has been a marked decline in incidence of vaccine-preventable diseases. The immunization coverage and decline in the disease incidences are shown in Figures 2,3,4,

In 1999, over 90 percent of children under 1 year of age was protected against tuberculosis, diphtheria, pertussis, tetanus, polio and measles.

From 1988, strategies to achieve the twin goals of eradication of poliomyelitis and the elimination of neonatal tetanus were developed. The last virologically positive, confirmed case of poliomyelitis was reported in 1993. The country achieved neonatal tetanus elimination status (less than one case per 1000 live births) in 1995. Activities to achieve zero incidence are being implemented.

### **Setbacks**

#### **Surveillance**

Existence of vacancies of medical officers in the specialist grade and other staff at the central Epidemiology Unit and the regions are a major setback. Absence or shortage of Epidemiologists at the central and regional levels hampers effective disease surveillance and control. Most of the qualified medical officers in this field are not willing to accept these posts due to lack of incentives and other infrastructure facilities including official transport and accommodation.<sup>9</sup> The establishment of the proposed provincial epidemiological units has not been implemented.

The establishment of an early warning system and rapid response teams at regional level for containment of disease outbreaks, emerging and re-emerging diseases are taking place at a very slow pace due to lack of co-operation from the regional staff.

A Public Health Bacteriologist qualified in bacteriology, as well as in public health, worked as a member of the epidemiological team for outbreak investigations and for special studies. This post was not filled after the retirement of the officer in the early eighties. At present the public health laboratory services are met by the Medical Research Institute situated in Colombo and other laboratories in some major hospitals

in the regions. The public health laboratory services for disease control needs to be re-established at the centre and in the regions.

## **Disease control**

### ***Measles***

Though the general immunization coverage for EPI vaccines is good, immunization coverage for measles vaccine is not satisfactory in some areas. This un-immunized susceptible population built up during the last 7-8 years, causing a large outbreak of measles, in the last quarter of 1999. Outbreaks of measles occur when a critical mass of susceptibles builds up. This occurs due to many other reasons. In Sri Lanka immunization with measles vaccine commenced in August 1984 and the coverage improved over the years. The unimmunized children over the years contributed to the susceptible mass. The vaccine efficacy is in the region of 85-90 percent. This results in the collection of 10-15 percent of unprotected children yearly, adding to the susceptible mass. Moreover, there are some primary and secondary vaccine failures. All these children contribute to the susceptible mass and when a critical mass is built up an outbreak occurs. In order to prevent this build up, a decision was taken to introduce a second dose of measles vaccine in the form of measles-rubella (MR) vaccine at the age of 3 years. "Catch up" immunization campaigns will also be conducted at suitable intervals.

### ***Polio Eradication***

The Acute Flaccid Paralysis surveillance for the Polio Eradication Initiative and vaccination coverage has not been at an optimal level in the war-torn Northern and Eastern Provinces of Sri Lanka. In addition the continued threat of the re-introduction of the virus from the neighbouring countries also exists.

### ***Pertussis***

A 'whooping cough' outbreak reported in 1997 caused confusion among medical professionals, politicians and the public and ended up with the appointment of a presidential committee for investigation.

The management of this outbreak showed the importance of obtaining good quality vaccine. Vaccine will now be obtained only from sources approved by WHO. It also showed that the maintenance of the cold chain and maintaining a high coverage is important to prevent outbreaks. This outbreak also showed the necessity to strengthen laboratory confirmation of the diagnosis.

## **Present scenario and the future challenges**

With the epidemiological transition in the country during the last four decades, the role of the Epidemiology Unit has changed. Accordingly the new Epidemiology Unit undertakes surveillance of all communicable and non-communicable diseases, except malaria, filariasis, tuberculosis, leprosy, STD/AIDS and cancer, which are undertaken by the respective specialized control programme. The Unit also undertakes surveys and studies in the country on epidemiologically important health problems and issues. In addition, the Epidemiology Unit is responsible for the control of vaccine preventable diseases, diarrhoeal diseases, acute respiratory infections, dengue fever, dengue haemorrhagic fever, Japanese encephalitis and other emerging and re-emerging diseases which are not controlled by any of the existing specialized campaigns.

With the demographic transition, the aged population over 60 years will increase to about 20 percent in three decades. Older persons may need institutional as well as community care. To meet the problem of an aged population, social and medical expenditure will have to be increased. Non-communicable diseases like cardiovascular and cerebrovascular diseases, cancer, mental illness and other debilitating conditions will demand additional services in terms of medicine, specialized institutions, technology and special professionals.<sup>10</sup> The epidemiological activities in Sri Lanka should also be improved to face these additional demands with skilled epidemiologists to conduct research activities and provide services related to existing and emerging health problems.

There is also a likelihood of the occurrence of new, emerging and re-emerging diseases. The country has to address the problem of importation of new or nearly eradicated diseases like plague, yellow fever, ebola, some types of influenza, and even polio. Surveillance, prevention and control of these diseases will be a real challenge to the health sector and to the epidemiological services.

Both developing and industrialized nations have begun to implement innovative measles immunization and surveillance strategies to eliminate indigenous transmission of the measles virus. These measles elimination strategies include implementation of catch up campaigns, keep up campaigns and follow-up campaigns. Because of the continued threat of virus re-introduction, vaccination needs to be continued until measles eradication is achieved.

Most of the developed countries now use modern methods and tools in epidemiology. Some of these modern methods like epidemiological modelling, genetic epidemiology and epidemiological fingerprinting will be useful for the epidemiologists to understand the spread of diseases and to implement preventive and control measures in the future.<sup>11,12,13</sup> Epidemiologists and other relevant staff in the system will require training in these aspects to face the new health problems.

“No matter what the future may hold, epidemiology will have much to contribute. Epidemiologists will track the cause and origin of both new and older diseases, evaluate therapies and public health programs, investigate and solve outbreaks of disease, and record the history of the rise and fall of disease in populations. And epidemiologists will serve to remind both health professionals and politicians of the primary mission of medical science: better health for all peoples” – Paul Stolley and Tamar Lasky.<sup>14</sup>

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## HEALTH CARE IN THE PLANTATION SECTOR

*N W Vidyasagara*

### Background

The origin of the plantation sector in Sri Lanka is historically a part of British colonial rule in the country. During this period, three major cash crops namely coffee, tea and rubber were introduced, to support the creation of an export oriented economy from what was mainly a subsistence based economy. A dominant agrarian economy became commercial and capitalist.<sup>1</sup>

In the 1820's coffee plantations first came into being and became well established during the period 1835 to 1880.<sup>2</sup> In the 1880's when coffee was at its height, it was devastated by the leaf fungus *Hemileia vastratrix*. Following the collapse of coffee the cultivation of cinchona was attempted, but finally it was tea that gradually replaced coffee to become the major plantation crop in the country. The end of the 19<sup>th</sup> century and the beginning of the 20<sup>th</sup> century, also witnessed the establishment of rubber plantations in the mid and low country areas of the island. In the late 1880's, indigenous planters took to coconut cultivation, which flourished predominantly in the North Western Province.<sup>3</sup>

key requirement for coffee cultivation was the availability of sufficient labour especially during the picking season. Attempts to obtain indigenous Sinhala labour from the surrounding villages was not successful, partly due to the influence of the feudal system, the arduous regimented labour, poor working conditions, unattractive remuneration and the availability of a living from their own lands. The colonial planters then turned to the large reservoir of labour which was available in South India. Thousands of Indian labourers thus began to make an annual trek to the coffee plantations in the Central and Southern regions of the country. These labourers were exploited by planters and their recruiting agents alike and in travelling across the dry zone of Sri Lanka, were subjected to high levels of mortality and morbidity. The main route taken by the Indian migrant labour till the end of the 19<sup>th</sup> century, was referred to as the 'North Road'. It was the most popular route as it was the cheapest. Landing at Mannar or Talaimannar the immigrants were obliged to walk to Madawachchiya and then along the North Road through Anuradhapura and Dambulla to Matale, a distance of 131 miles. This migrant labour also brought with them deadly communicable diseases particularly cholera, small pox, dysentery and plague. Large numbers died on the way from these diseases and also from starvation, exposure or exhaustion. The sick were either abandoned or admitted to hospitals built along the route, specially for this migrant labour. The districts at the beginning of the route acted as a kind of natural quarantine in protecting the plantation districts. Though the mortality was heavy, the great majority reached the plantations. The "immigrant hospitals" set up to cater primarily for migrant labour, have developed into important institutions in the present medical structure. The influx of migrants continued despite the difficulties faced, due to the appalling economic conditions at that time in South India.<sup>4</sup> In 1899 the North road was finally closed to immigrant traffic and an alternative sea route established from Tuticorin in South India to Colombo. A transit camp (at Ragama) served as a quarantine facility from where the migrant labour was sent by train to the plantation districts. This route though more

costly than the former, was able to minimize the incidence of disease spreading in the country.<sup>2</sup>

The shift from coffee to tea resulted in a significant demographic development. The seasonal movement of immigrant labour that returned annually to India, changed with the growth of tea and rubber plantations. Immigrant labour now tended to settle in estates as a 'permanent' resident labour force. The plantations, which were privately owned, became an enclave in relation to the surrounding rural areas. The people who lived and worked in them became an isolated group. Geographically nearly 500 plantations came to be spread out over the Central, Uva, Sabaragamuwa, Western and Southern provinces, with a major concentration of resident estate population living in the up country or hilly regions of the country. Substandard housing consisting of barrack-type 'line rooms', poor water supply, lack of sanitary facilities, ignorance and illiteracy were major factors that affected the health of this immigrant population.

### **Health care on the plantations**

The provision of health care on plantations or estates as they came to be known, has close links to the historical and political events that surround this sector. Three definite periods can be identified namely: the colonial period and the years that followed up to the mid 1970s, the period of total state ownership and management, and the period of restructuring.<sup>5</sup>

#### **(i) The colonial period and the years that followed up to the mid 1970's.**

This period witnessed the development of a basic, curative oriented health service on estates. Initially, with no health system in place individual planters kept stocks of medicine to treat the labour. Later, groups of estates employed a dispenser and at times a doctor. In 1865 the Colonial Governor's concern regarding health on estates was expressed by the enactment of the Master-Servant Law, that made it mandatory for an employer to provide lodging, food and medical care in times of sickness for employed labour.<sup>2</sup>

The colonial Government considered the health of the plantation worker economically important enough to be safeguarded. The first practical intervention came about in 1872 with the enactment of Ordinance No 14. This was mainly a planter managed medical scheme limited in scope, with minimal Government control or supervision and failed to bring about any improvement in health.<sup>2</sup> In 1879 a Commission appointed by the Governor found the estate health system to be inadequate, resulting in the Medical Wants Ordinance No 17 of 1880. Its main provision was for Government to undertake the medical care of estate workers. Under this Ordinance estates were grouped into plantation districts and each district was provided with a district hospital for estate labour, under the care of a District Medical Officer with one or two medical assistants. This nomenclature even exists today though its origin may have been forgotten. The plantation districts did not however conform to the administrative districts.<sup>4</sup> The Ordinance also provided for visits to estates by the medical officer. In addition the Government decided to throw open for the benefit of estate labourers, the Government Civil Hospitals situated in or near the plantation districts.<sup>2</sup>

In spite of these initiatives, the reported death rate in 1893 among immigrant labour admitted to district hospitals, was much higher than the general population. The Hospital Mortality Commission recommended that facilities for treatment should be

made available as near to the work place as possible. This resulted in the Estate Dispensary Scheme manned by medical assistants and dispensers. From 1900 onwards there was a rapid increase in estate dispensaries, which increased from 15 in 1893 to 143 in 1906.<sup>2</sup> Two important legislative enactments namely the Medical Wants Ordinance No.9 of 1912 (with subsequent amendments) and the Diseases (labourers) Ordinance No.12 of the same year, provided for domiciliary health care, institutional health facilities on estates, and the appointment of Inspecting Medical Officers to monitor the health of the labour and report on estate sanitation. A tax rebate was given to those that complied with the Ordinance. While actual implementation left much to be desired, many estates did maintain satisfactory medical facilities. In 1930, the Ceylon Administrative Report of the Director of Medical and Sanitary Services, identified the hardships of pregnant women, the lack of maternity wards and the need for well trained midwives. From 1932 to 1949 the number of midwives on estates increased from 89 to 272.<sup>6</sup>

The overall effect of health legislation did have some influence on mortality, but being mainly curative in approach did not lend itself to achieving long term health benefits. Infant mortality (as an index of community health) continued to remain high. From 1972 to 1975 the infant mortality rates were consistently over 100 per 1000 live births, which was twice the reported national rate.<sup>7</sup>

An account of this period would not be complete without some reference to the effects of hookworm and malaria on the estate population. Hookworm infection was first identified as a major public health problem, when it was found to be exceedingly common among South Indian immigrant plantation labour. In the official Administrative Report Sir Allan Perry had stated that “the disease like many others in the island is brought over from India by the Malabar immigrants, in whom it was almost a natural condition to house a intestinal parasite. The ravages of the disease lies in the sequelae and a very large death rate exists from the profound anaemia which results from the affection”.<sup>4</sup> In 1903 Perry again asserted that the disease was been constantly introduced from India by the immigrants and was spreading owing to their careless habits. In 1906 the Planters Association of Ceylon (PA), was urged to take remedial action. This caused a bitter controversy between the powerful planting interests and the health authorities, since the former did not wish to incur any expenditure on estate sanitation and considered hookworm the “lesser evil”. After much resistance, the PA in 1915 permitted the Rockefeller Foundation to fund a pilot project on estates for control of hookworm, to be implemented by the Medical Department. This project initially consisted of administering oil of chenopodium in the form of capsules to the estate population. The results were excellent and demonstrated the salutary effects of the project. On realizing the economic value of preventive measures, the PA were willing to extend the deworming programme to cover all estates and install latrines on estates, with training of the labour on how to use them. The Rockefeller Foundation then extended the hookworm campaign to the Sinhala villages.<sup>4</sup>

“Malaria was a seasonally recurring pestilence in the majority of low and mid country estates and for an unfortunate few a more or less permanent scourge”.<sup>8</sup> At the request of the Ceylon Association in London, Sir Ronald Ross (who first identified the mosquito as the malaria vector), visited the island in January 1926, and advised the Ceylon Estates Proprietary Association (CEPA) on ways to reduce malaria. On his recommendation a plantation malariologist was appointed, following which statistics of malaria in estates and a system of forecasts and warnings were instituted. The

practical measures relied on were antilarval, (localised oiling including river beds in times of drought), with drug prophylaxis and after treatment. These activities were administered by the CEPA Malaria Control Scheme. The great malaria epidemic of 1934/35 which swept the island was said to have been responsible for the loss of 100,000 lives. During this epidemic, estates that carried out the instructions of the Malaria Control Scheme, suffered appreciably less than the totally unprotected village and urban populations. In 1937 the government launched the Malaria Control and Health Scheme (later known as the Anti-Malaria Campaign -AMC). The CEPA Malaria Control Scheme extended its full support and maintained close coordination with the AMC. As the problem of malaria was brought under control, the CEPA malaria control scheme, extended its advisory services to “matters affecting health, hygiene, nutrition and sanitation in the estates”. In 1949 the name was changed to Planters Association Estate Health Scheme (PAEHS), which now also extended its advisory services to the up country estates not affected by malaria.<sup>8</sup>

The events of the mid 1940's had a direct bearing on the estate population. In 1948 Ceylon gained independence from the British. The following year the Citizenship Act of 1949 was enacted, which made those immigrants of Indian decent “stateless”. This also meant the loss of adult franchise granted in 1931 to all citizens. Left isolated within the confines of private or foreign owned estates, social change including that of education and health, tended to by pass this group, with social indicators remaining virtually static.

The Sirima Shastri Pact of 1964 was an effort to solve the question of statelessness. Under this pact, of an estimated 975,000 stateless persons, India was to grant citizenship to 525,000 persons (with their natural increase) and likewise Sri Lanka to 300,000 persons. The remaining 150,000 was to be decided at a later stage. Implementation was to be over a 15 year period. A further enactment in 1988, referred to as the “grant of citizenship to stateless persons (special provisions)”, provided for those who had not applied for Indian citizenship and were lawfully resident in Sri Lanka to obtain a Certificate of Citizenship or an affidavit (9). These events have had a significant bearing on the future of the immigrant Indian estate population in Sri Lanka.

In summary it could be said that the colonial period and the years that followed upto the mid 1970's, were characterized by very high morbidity and mortality due to bad housing, insanitary and congested living conditions, high levels of illiteracy and limited health care.

**(ii) The period of total state ownership and management of estates,**

This period followed the implementation of Stage I and Stage II of the Land Reform Law in 1972 and 1975 respectively. Private holdings over a specified acreage and all company owned estates were nationalised and placed under the management of two Government estate agencies, - The Janatha Estates Development Board (JEDB) and the Sri Lanka State Plantations Corporation (SLSPC). For management purposes each agency established a central office in Colombo and offices in the plantation regions (JEDB-7 and SLSPC-8). Following nationalization, the accumulated burden of providing basic services including health became Government responsibility. In anticipation of nationalization, neglect set in on many estates with little or no development taking place. The appalling health situation demanded effective measures to improve standards of health care for this sector of the population, resulting in a wide range of health and welfare interventions, with a major emphasis

on preventive and promotive health, utilizing a primary health care approach. In 1973 the first country agreement between the Government of Sri Lanka and the UNFPA, provided funding for family health (FH) services on estates (10). The need for such intervention was borne out in the report of the Medical Director PAEHS in 1969, which stated that “greater attention needs to be paid to antenatal and child welfare work, health education and family planning”.<sup>8</sup> The Family Health Bureau (FHB) of the Ministry of Health was given the responsibility for implementing the Estate Family Health (FH) Services Project, which primarily involved the provision of maternal and child health (MCH) services, family planning and other related activities. A medical officer was appointed to the FHB to plan, coordinate and monitor the execution of this Project (the writer served in this capacity at the FH Bureau). Ten medical officers (estates) with transport facilities and supported by Public Health Nursing Sisters, were appointed to establish a network of 200 estate (MCH) polyclinics that would provide integrated MCH/FP services to meet the needs of the estate population. The programme also served to upgrade the knowledge and skills of estate health staff, so as to enable them to competently deliver these services. Women were given paid leave by the management to attend these polyclinics which were held on a fixed day each month. The medical officers (estate) were under the overall supervision of the FHB, with immediate supervision provided by the respective Regional Directors of Health Services (earlier referred to as Superintendents of Health Services). These medical officers operated out of Health Units (HU) or MOH offices, strategically located in the plantation regions, namely HU Kalutara, Akuressa, Kegalle, Nawalapitiya, Nuwara Eliya, Gampaha, Kandy, Ratnapura, Bandarawela and Badulla. Initially 200 polyclinics were established on estates, which subsequently expanded to 400. This polyclinic initiative and its acceptance by estate management, set the stage for introducing more preventive health programmes/activities on estates.

In 1978 the two estate agencies developed their own social development divisions (SDD's) to be directly responsible for health and welfare activities on estates. In 1980 the Expanded Programme on Immunization (EPI), was introduced to the estate sector, with funding and material support from UNICEF. Under the polyclinic programme, the estates were dependant on vaccines brought by the visiting medical officer (estates) and all estates at that time were not yet served by polyclinics. This warranted an alternative strategy for implementation of the EPI. Five to seven estates were grouped around a 'key estate', which served both as a sub-station for vaccine storage and for supervision, monitoring and reporting of immunization activities within the 'group'. The regional plantation offices functioned as Regional Vaccine Centres, and the managers SDD of the JEDB and SLSPC were responsible for overall programme supervision and management. Technical support and guidance was provided by the FHB. It is to the credit of the estate sector that the EPI achieved a high coverage of age appropriate immunization, maintaining proper cold-chain conditions for vaccines. The impact of the EPI was dramatic as evidenced by the rapid decline in incidence of the six immunizable (EPI) diseases of childhood on estates.

Commencing in 1981 the two estate agencies appointed their own medical staff to take on the role of health managers, at central and regional levels. As the two estate agencies developed their own capabilities to manage health programmes/activities, the medical officers (estates) were gradually withdrawn. The FHB continued to provide technical guidance and monitor health activities on the plantations.

Epidemics of diarrhoea and dysentery were common on estates, especially in the hill country estates with congested living conditions. The mid-1980s witnessed large investments to improve water supply and sanitation through projects funded by donors, the UNICEF and the World Bank. In addition the Control of Diarrhoeal Diseases (CDD) Programme of the Ministry of Health was actively implemented on estates with specific emphasis on oral rehydration therapy (ORT), the use of oral rehydration salts (ORS) and personal hygiene. These efforts resulted in a marked decline in mortality as well as epidemics of diarrhoea in the estate sector.<sup>11,12</sup>

An urgent need existed to minimize hazardous deliveries occurring in dark unhygienic line rooms. The construction of maternity units on estates was encouraged with funding through donors, ADB and the World Bank, in order to promote institutional births. In 1992 the Estate Health Bulletin reported 87.3% institutional births of which 40% were in Government hospitals.<sup>12</sup> Under the Maternity Benefits Ordinance, women are provided with a payment (based on loss of workdays) as financial support for the mother and infant.

Poor maternal nutrition together with anemia and low birth weight have continued to be problems on estates. Routine antihelminthic treatment, iron/folate supplementation, nutrition education, family planning and reduction of energy expenditure in the last trimester are emphasized at clinics and during 'line visits'.

Prior to nationalization family planning awareness, education and services were provided by the Family Planning Association of Sri Lanka (FPASL) on request. The post nationalization period ensured that all family planning methods were accessible to the community, either on the estate itself or through Government facilities. The Demographic and Health Survey (DHS) 1993 observed that estates have a high percentage (45.5%) of non-current family planning users. Estate women also have the highest use of sterilization (44%) for all sectors, with 7% using traditional methods and only 3% using temporary modern contraceptive methods, which is the lowest for all sectors. DHS 93 also observed that the estate sector showed the highest percentage (38.8%) of induced abortion, reiterating the need to improve family planning acceptance, particularly the temporary modern methods.

As with other sectors, child nutrition has been a priority concern. Regular programmes on nutrition education for mothers and in more recent times for adolescent girls have been stressed. DHS 93 revealed that 54 percent of estate children showed signs of chronic malnutrition, which is twice that of rural areas outside the estates. The prevalence of stunting is more when mothers had no education. By sector, estate children have the lowest percentage of wasting, which is to be expected with more stunting among them. The introduction of growth monitoring has done much to improve the understanding of the staff and community alike regarding nutrition, child growth and development. The growth monitoring on estates is usually centred around the crèche. With UNICEF advocacy and support, the crèches on estates are now a far cry from the basic custodial care that prevailed earlier. Crèche attendants have been recruited and trained, with the accent on total development of the child.

In 1978 a new category of health/welfare worker, referred to as the Plantation Family Welfare Supervisor (PFWS) was appointed, after a training of three months, to be a 'link worker' between the management, the health services and the estate community. Most estates have a PFWS to support health and welfare activities.

The availability of health personnel on estates has been and continues to be a problem, both in terms of numbers and their competency. Treatment functions at the estate dispensary are provided by registered/assistant medical officers (RMO/AMO), approved estate dispensers also referred to as estate medical assistants (EMA), pharmacists and apprentice pharmacists. This staff together with estate midwives, have adequately performed the functions expected of them. Due credit must be given to them for effectively implementing and maintaining health programmes/activities on estates, sometimes under very difficult circumstances.

Two attempts were made to train AMOs for employment on estates. In both instances, the trained AMOs using various ploys were able to get themselves absorbed into the Ministry of Health. The training of midwives for estates by the Ministry of Health however, has been satisfactorily implemented and needs to be actively supported and sustained. Much time and effort had also been devoted to in-service training of estate health personnel, by the two estate agencies.

A summary of the major strategies used during this period have been (a) the reorientation of estate management and estate health staff regarding the broad concept of health and the cost effectiveness of preventive and promotive health programmes. (b) strengthening the health infrastructure with appropriate health personnel to meet the health needs at estate level and the provision of physical inputs to health institutions, patient transport, drugs etc. (c) developing a system for effective utilization of health data generated on estates (d) maintaining a close dialogue between the estate sector and the Ministry of Health, particularly regarding the implementation of national health programmes.<sup>5</sup>

Donor assisted programmes have also been undertaken to improve worker housing, provide safe water and better access to sanitation. The magnitude of this problem will necessitate a massive capital investment that would require long term planning and programming.

The impact of the health interventions in the estate sector is clearly reflected by the progressive decline in the infant mortality rate from 104 per 1,000 live births in 1973 to 77.0 in 1980, 49.6 in 1985 and 38.6 in 1990.<sup>6,12</sup> Though still higher than the national average, the relatively short period of time in which this was achieved through selected direct health interventions, has been remarkable.

### **(iii) The period of restructuring**

The tea industry like any other agricultural enterprise is subject to the vagaries of the market and the cost of production. The local tea industry was adversely affected and as a consequence, the two Government estate agencies in 1992 were subjected to a process of restructuring by the Government. The underlying principle was to privatise the management of estates, with the intention of improving efficiency, achieving higher productivity and generating more profits. The main feature was the formation of 23 Government owned Regional Plantation Companies (RPCs) each comprising “groups” of estates, that ranged from 12-29 estates. The operational management of these estates were contracted out by the RPCs to private sector companies. This however did not achieve the desired results and the Government in 1995 initiated the sale of majority holdings in the private sector. By 1998, there were 21 fully privatised companies, with the JEDB and SLSPC also managing certain groups of estates. The Government retained a ‘Golden Share’ in each company to ensure conditions relating to the transfer. The privatisation process resulted in a

complete change in the management structure for health and welfare, established under the JEDB and SLSPC. The social development divisions ceased to function. Instead a new limited liability company called the Plantation Housing and Social Welfare Trust (PHSWT), was established under the Companies Act. The estate health and welfare staff now became employees of the respective plantation companies.

The PHSWT became operational in January 1993, with its head office in Colombo and seven regional offices. A twelve member tripartite Board directs the affairs of the PHSWT. Six directors represent the plantation companies, four represent the State from the Ministries of Finance, Health, Housing and Plantation Industries, and two the trade unions. The operating costs of the PHSWT are met by the RPCs, through their managing agents, in terms of a population-based levy. Being an independent organisation the PHSWT does not have any direct administrative authority over the implementation of health and welfare on the plantations, unlike the social development divisions of the JEDB and SLSPC. This considerably weakens the position of the PHSWT in planning and directing health activities on estates. Given these limitations, the PHSWT and its regional offices have been able to establish good liaison and credibility with the plantation companies in maintaining and implementing health and welfare programmes/activities on estates. The organisational and management structure in the estate sector has also contributed in no small measure to the effective implementation of health programmes. While the population coverage for most programmes have been satisfactory, issues relating to quality still need to be improved. The impact of the estate health services is reflected in some of the health indicators for 1997.<sup>13</sup> The crude birth rate (CBR) was 14.8 and the crude death rate (CDR) 6.5 per 1,000 resident population respectively. The infant mortality rate (IMR) was 24 per 1,000 live births, institutional births 91.6% and the incidence of low birth weight 16.1%. Contraceptive prevalence was 70.5%, with use of permanent methods 56.5%, temporary modern methods 10%, and traditional methods 3%. The most recent data available for the year 2000, reports a CBR of 16.9, CDR of 5.9 and an IMR of 19.1 for estates under the purview of the PHSWT. Maternal mortality rates (MMR) during the 1990's have fluctuated between 1.9 and 0.9 per 1,000 live births. The marked variation in MMR is mainly due to the small numbers of maternal deaths, which when calculated as a rate results in much distortion. Given the difficult terrain and the long distances that need to be traveled, many of these deaths have been due to delay in reaching government institutions that provide emergency obstetric care services.

The emphasis on interventions for prevention and control of anaemia, have shown some response. A PHSWT commissioned study, by Atukorala and Radhika in 1999 revealed that the prevalence of anaemia in pregnant estate women was 25.1% compared to 58.4% in a previous study during the period 1998 to 1991 (de Silva and Atukorala). However this study also noted that 40% of the pregnant women had depleted iron stores, indicating that iron deficiency is still a major problem.<sup>14</sup>

Alcoholism is a significant problem on estates, in all the regions, and affects the health, wellbeing and economic status of families. Recent initiatives with the Alcohol and Drug Information Centre (ADIC) to develop strategies that address this problem have shown some response albeit on a limited scale. Its wider application however needs to be tested.

The PHSWT has actively encouraged participatory programmes involving the estate community, that have been mutually rewarding. These include the health volunteer

programme, creche development committees, empowerment of women through credit and savings schemes (Mahila Shakthi), water management committees, self-help housing schemes etc. All these initiatives have been gender sensitive in their implementation.

Progress regarding the improvement in water and sanitation has been slow. Approximately 78% of estate households under the purview of the PHSWT have a piped water supply. Only 59% of households have latrine facilities either individual or shared, with sanitation still remaining a public health problem.<sup>13</sup> More recently both housing and sanitation have received massive funding, by both Government and donors.

Soil transmitted nematode infections (roundworm, hookworm and whipworm), a legacy from the colonial past, still continues to be widely prevalent on estates. Hookworm infection is more common in the low and mid country estates where climatic conditions are very favourable. The high prevalence rate of nematode infection is also a reflection of the faecal contamination of the environment, that still persists on estates even today. The PHSWT with assistance from UNICEF, has initiated a routine deworming programme for estate children and adolescents in the age group 2-18 years, in which a single dose of mebendazole (500mg) is administered biannually. The plantation companies have also been encouraged to expand the deworming programme to cover the entire estate population, with the PHSWT reimbursing half the cost of the drugs through its Plantation Development Support Programme. A few of the more enlightened plantation companies have taken up this offer, with the expanded programme now being implemented in about 15-20% of estates.

The plantation workers, most of whom are unskilled or semi skilled are exposed to physical and chemical hazards in the course of their work, warranting more attention to occupational safety and health (OSH). Better data collection on OSH, as well as greater awareness and training are required at all levels. The PHSWT in its recent revision of health information, has included OSH data collection within the routine health information system.<sup>15</sup>

Overall, the positive health trends that have taken place in the estate sector, have been maintained during the early years of the restructuring period, which is encouraging. Regional variations are also observed, as well as some striking differences in performance between individual estates. A certain degree of reluctance has also been noticed on the part of some plantation companies to adequately meet their obligations in the provision of health care on estates. Mention must also be made regarding the limited role played by the provincial/district health authorities, in assisting estate management to maintain and improve health care on estates. More recently however, the Provision Health Authorities in some areas, have shown a positive interest in estate health, by adopting an integrated approach with estate management, in providing healthcare on estates.

### **Healthcare in the new millennium – 2001 and beyond**

The post privatisation scenario in the plantation sector, gives priority to minimizing expenditure and maximizing profit. In such a milieu, health and welfare services tend to become prime targets, unless adequate safeguards are provided to at least maintain what has already been achieved. Two attempts by representative committees (the last being in 1997), to have some legislative provision in the form of an ‘Estate Health

Law', though submitted in draft form, was not taken to its logical conclusion. The present situation therefore makes the support and closer involvement of the Ministry of Health/Provincial Health Authorities all the more important. The plantation industry is both complex and unique, in that it not only employs a massive work force but also provides for the workers and their families to be resident within the industry. The management structure (not necessarily operating in the colonial mode) must be understood and appreciated, with the realisation that what is possible in a rural setting is not necessarily replicable on estates.

Today the issue of health personnel to work on the plantations is a major concern, the training of EMAs and AMOs having been discontinued. The sector is now hard pressed to find suitable health personnel to maintain the dispensary services, that serves a resident population of 867,084 (as well as the non resident labour), on 466 estates, which come within the purview of the PHSWT.<sup>13</sup> Some attempts to introduce Government AMOs to work in estate health facilities managed by plantation companies, had created problems regarding supervision and management. Working hours for out-patient services also did not coincide with the needs of estate labour. These issues had been discussed between the Planter's Association (PA), the PHSWT and the Ministry of Health, but a mutually acceptable solution could not be reached at that time. Employing a MBBS qualified doctor to serve a "group of estates", both as health manager and service provider has been suggested, but most companies remain wary of this proposition. At present RMOs, AMOs, EMAs and pharmacists are employed in estate dispensaries. The estate dispensary as the first point of contact for the estate worker provides basic out-patient services, makes referrals to government institutions, maintains service records and vital statistics, provides some preventive healthcare, and is an important facet in the running of the plantation industry. The requirements of personnel to provide for the future needs of the dispensary service on estates must receive serious consideration, given the non availability of AMOs. The future of the dispensary services may lie in the recruitment of qualified pharmacists provided with some additional training and supervision, to maintain the estate dispensary services.

The registered midwives employed on estates have been the mainstay of the MCH/FP services. It is vital that the Ministry of Health continue to train more midwives for employment on estates in the future. Estate management should in turn give due recognition and adequately provide for this professionally registered category of health worker (unlike the earlier untrained midwife), by ensuring suitable living conditions and appropriate remuneration.

The National Health Policy (1996) states that "the Health Ministry will strengthen integrated approaches with other Government and non Governmental agencies to facilitate further coordination for better health care", the key word being integration as different from takeover. Today under the privatised management system, estates have been grouped into company-wise clusters, to provide a more coordinated approach to management. This 'cluster' approach is also well suited to initiate a health planning process between estates and the respective DDHS/MOH, regarding the health needs on estates. The process could identify the 'service gaps' within the estate cluster and the resources needed to meet any shortfall. The development of a 'Cluster Health Plan', between the plantation company and the Provincial/Regional Health authorities, could form the basis for planning and implementing an integrated health service on estates, in a spirit of mutual cooperation. It is heartening that today

many Medical Officers of Health have realised that health has no barriers and that the estate community is also their concern and responsibility.

A recent political decision required the Ministry of Health to takeover the 54 estate hospitals. This commenced in 1994 and by mid 2000, nineteen estate hospitals were at various stages of implementation. Whether estates should maintain hospitals, given the prevailing extensive national health infrastructure, is questionable. In reality most estate hospitals have modified their services accordingly, and actively maintain only the maternity and dispensary services. In this scenario, what is of real concern is that, prior to commencement of the takeover of estate hospitals, no firm criteria had been established to ascertain either the usefulness, or the need for 'takeover' of these hospitals. Neither had any study been done to identify the issues involved with such a 'takeover', be they organisational, financial or operational. The problems associated with the 'takeover' process are all too well known to those involved. The cost incurred has also been considerable and one wonders if such expenditure can be justified. By way of example, the expenditure involved with the takeover of seven estate hospitals in the Central Province during 1998/99 has been a little over Rs.34 million, with a further allocation of Rs.9.5 million for the year 2000 (Ministry of Livestock Development and Estate Infrastructure). This does not include recurrent expenditure for personnel, medical supplies, drugs, transport etc. and other capital costs that need to be incurred annually. The National Health System does not need to add peripheral institutions (at the level of a rural hospital or even a peripheral unit) to its already well-established network of institutions, but instead to selectively develop some of the existing District Hospitals to competently handle emergencies. This is of particular relevance in the estate sector where distances matter. Many estate maternal deaths may not have occurred, if the time spent in reaching Government hospitals with essential obstetric services, could have been reduced. It may now be prudent to pause and take stock of the entire process, before proceeding any further.

In view of the uncertainties created in a 'takeover situation', there have been mixed reactions from plantation companies regarding the extent of their involvement in estate health, be it financial or otherwise. A study conducted in 1996 on twenty estates, revealed that recurrent costs made up 60-65% of the total expenditure on health, of which most was spent on personnel emoluments. Physical maintenance of estate institutions with a few exceptions was very low and drugs and medical supplies accounted for only 3-5% of recurrent expenditure. Statutory expenditure (mandated by legislation) was between 30-40% of total expenditure, while capital expenditure was minimal ranging from 2% to zero.<sup>16</sup> Though not a reflection of the estate sector as a whole, it does give an indication of the ambivalence that prevails towards health care on estates, unless mandated by legislation or at least made a part of collective agreements, between the plantation companies and workers. The long term benefits of a healthy and contented workforce on productivity are well known to plantation management. A few have already set high standards for themselves in respect of health and welfare on estates.

Mention needs to be made regarding the considerable number of proprietary owned estates and 'small holdings', many of which have retained resident estate workers and their families. There appears to be no formal system at present, to identify and provide for the healthcare needs of this section of the estate population. This is an area which the Provincial Health Authorities would need to address as early as possible.

Some of the complacency towards provision of health and welfare may lie in the belief that the estate community is still a 'captive' population. This is furthest from the truth, particularly in the mid and low country estates, with estate labour seeking other avenues of employment. In this context, David Dunham has observed that 'estate work seems increasingly to be acquiring the stigma of a low status occupation. Workers turn out for neighbouring (tea) smallholders, as gem miners, as domestic workers, as boutique help or as general labourers. Sri Lankan citizenship has had the unexpected side effect of facilitating geographical mobility to urban centres and as elsewhere in the rural sector, increasing awareness of the material benefits of an open economy has begun to permeate the local community and raise expectations.'<sup>17</sup>

The plantation industry is vital to the country's economy and must be nurtured not only in terms of agriculture and management practices, but also its workers who are the means of production. Needless to say, the contribution of the state health sector towards this end is vital, and should be done through close dialogue with plantation management and in a spirit of mutual cooperation. Precipitate actions must be avoided, with future planning based on practical and realistic considerations. The 'estate cluster health plan' referred to earlier may provide a good starting point for planning between the two sectors. The new millennium will undoubtedly present many challenges not only for the industry itself, but also to those who live and work on the plantations.

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## MALARIA IN SRI LANKA – THE PAST, THE PRESENT AND THE FUTURE

*W P Fernando*

### **Historical overview and past trends**

A review of the records on the history of malaria in Sri Lanka indicates that the disease has been present for centuries. A map published by the Dutch in 1683 is considered the earliest record in which the area of the old kingdom of Yala (in the Southern Province) is denoted as an area, which was “depopulated and deserted 300 years ago, by fever sickness”. Historians believe that the decline of ancient civilization from the beginning of thirteenth century was due to malaria.<sup>1</sup>

The inauguration of the first Anti-Malaria Campaign in Kurunegala during the year 1911 may be considered as the first organized state intervention towards prevention and control of malaria in the modern era. Measures to prevent vector breeding by environmental manipulation such as filling, draining and ‘oiling’ of breeding sites as a measure to destroy larvae were the control methods available at the time. Subsequently Anti-Malaria Centres were established at Mahara Prison, Anuradhapura and Trincomalee during the years 1923 and 1924 and in several more places afterwards.<sup>1</sup>

Appointment of the first malariologist in 1921 was followed by implementation of various malaria control measures under his supervision. These measures included introduction of larvivorous fish into breeding sites of the vector and draining or ‘oiling’ of breeding sites. The importance of malaria control in the estates was emphasized. A malaria control scheme for the estates owned by the Ceylon Estate Proprietary Planters’ Association was started in 1926.<sup>1</sup> The estate population comprised an appreciable population during this period.

Malaria control measures during the pre-DDT era (prior to 1945/46) were, in general, confined to larviciding by ‘oiling’ the breeding sites or application of larvivorous fish to breeding sites. Environmental measures to fill up the breeding sites or to drain out the water in them were also practised. In hyper-endemic malarious areas, quinine distribution was carried out during the period of seasonal rise in malaria.

The devastating malaria epidemic that swept the country in 1934/35 has been the worst recorded malaria epidemic that the country ever experienced. The entire Western and Sabaragamuwa provinces, lower parts of the North Western Province and major parts of Kandy and Matale districts were affected. A population of 3.1 million was living in the area hit by the epidemic. It is reported that 1.5 million contracted the disease and approximately 80,000 died during the 7-month period between October 1934 and April 1935.<sup>1</sup> This epidemic had very important sequelae. The Government commissioned an expert, Colonel C.A. Gills to study the 1934/35 epidemic and the problem of malaria epidemics in the country and to make recommendations with regard to the prevention of future epidemics. The report was followed by the inauguration of the Malaria Control and Health Scheme of 1937.<sup>1</sup>

A major breakthrough that took place in 1945/46 was the introduction of residual spraying with DDT (dichloro-diphenyl-trichloroethane). In fact, Sri Lanka (then Ceylon) was the first country in Asia to start DDT spraying for malaria control on a countrywide basis. The rationale was to drastically reduce the vector density by destroying the vector mosquito, which would rest on surfaces that have been sprayed

with DDT. The formulation sprayed had a long period of residual chemical activity. The local vector exhibited the habit of “endophily”, i.e., resting inside dwellings, after taking a blood meal.

The DDT-spraying scheme commenced in November 1945, when two mobile units started functioning in Anuradhapura and Kekirawa. By 1947, the entire dry zone (excepting the North Western portion of Jaffna peninsula), the entire intermediate zone, and parts of the wet zone subject to “epidemic malaria”, were being covered by the spraying programme. The spraying units operated either as “Truck Units” each with 9-15 spraymen supervised by a driver-cum-overseer and an overseer, or as “Walking Units” comprising an overseer and 3-4 spraymen. The latter units were employed in urban areas where a vehicle was not required by the unit because the dwellings were close to each other, or in very remote areas in which a vehicle could not be used.

The countrywide DDT-spraying programme resulted in a dramatic reduction in the malaria incidence. Cessation of malaria transmission was seen in the wet zone and in the intermediate zone. Consequently progressive interruption of spraying was carried out during the period 1951 to 1955.<sup>1</sup>

By the early part of 1955, large-scale spraying had been withdrawn. However, emergency spraying units were kept ready, and a surveillance system for the early detection of malaria patients was established. Appearance of insecticide resistance in some malaria vector species in other countries had been reported by this time, urging the necessity to limit spraying only to areas where insecticide spraying was really justified. Only 1,037 malaria patients were reported in 1958, as against 10,442 malaria patients reported in 1957.

The Eighth World Health Assembly held in May 1955, passed a resolution requesting the Governments to intensify their malaria programmes, to enable eradication of the disease before the serious problem of Anopheline vector resistance to insecticide emerged. The malaria *eradication programme* commenced on 2 December 1958, with the ultimate goal of elimination of the parasite reservoir in the country by the end of a 5-year period. The organizational structure comprised the Anti-Malaria Campaign, which would function as a decentralised unit of the Department of Health Services. The malarious areas of the country were divided into four regions, viz. the Northern Region, the Central Region, the Eastern Region, and the Southern Region. Regional Offices were established at Anuradhapura, Kurunegala, Batticaloa and Tangalle respectively.

Under the eradication strategy all dwellings in the endemic areas were placed under a regular spraying programme, using DDT as the insecticide and 390,233 houses were included in this spraying programme; 37 spraying units (comprising 13 Super Jeep units and 24 Jeep units) were employed. The criteria for the interruption of spraying were set as cessation of transmission, infant parasite rate reaching zero, and the annual parasite incidence declining to less than 0.5 per 1000 population.

By 1963 transmission was thought to have been interrupted, with only 17 malaria patients detected during the year. Subsequently the dry zone was placed under the *consolidation phase* in May 1964 by withdrawal of spraying.

The events that ensued during the following years were most unfortunate. Cases increased during the next three years and resulted in a flare-up in 1967 (3,466 cases) when two *P. vivax* foci appeared in Matale and Kurunegala Health Divisions. More

than one million cases were recorded during the epidemic of malaria, which reached a climax during the years 1968, 1969 and 1970. Being preponderantly a *P. vivax* epidemic the mortality during the epidemic was extremely low. Only 125 deaths have been reported during the period 1968-1970, as against a case-load of 1,446,551 reported during the same period. DDT spraying had to be resumed. All areas with malaria-transmission had been placed under spraying by the end of 1968.<sup>2</sup>

A very significant finding made in April 1969 was that vector resistance to DDT had started appearing.<sup>3</sup> Although a substantial reduction in the malaria incidence was observed during the years 1971 and 1972, subsequently an upward trend was seen again, presumably due to spreading DDT resistance in the vector. By 1975, there was a marked increase in *P. falciparum* infection, specially noticed in health areas Bibile and Monaragala. A *crash programme* to contain malaria commenced in March 1975 with the introduction of malathion spraying in the endemic health areas of Bibile and Monaragala and the adjoining parts of the health areas of Balangoda, Atakalampanna and Hambantota. Change of the residual insecticide from DDT to malathion was subsequently carried out in many other health areas, due to the poor impact of DDT spraying caused by increasing levels of vector resistance. Eventually, by July 1976, DDT spraying was completely abandoned.

A very ambitious project, the *Five-year Intensive Malaria Control Programme* commenced in August 1977, with assistance from several bilateral agencies and donor countries. Under the scheme, malathion (at a target dose of 2 g/m<sup>2</sup>) was sprayed in approximately one million structures located in the malarious districts, at 3-monthly intervals. Beside this principal strategy of vector control by indoor residual spraying, supplementary methods such as chemical larviciding during dry periods by the use of temephos (Abate), and space-spraying (thermal fogging/ultra low volume spraying) during times of large conglomerations of people during festival times, were also carried out. The surveillance system was strengthened by having *activated passive case detection* posts in a large number of medical institutions.

A marked reduction in the number of malaria patients was observed during the three year period 1978 to 1980, however, following the unusual drought that occurred in 1982 an epidemic that originated in the 'intermediate zone' spread to many parts of the country, reaching its climax in 1984. The incidence decreased in the following years but another major epidemic was experienced during 1987. Large scale residual insecticide spraying and the surveillance activities continued, but the high morbidity from malaria continued.

The first *falciparum* malaria patient showing resistance to chloroquine was detected in 1984 in the village of Wewala in the health area of Dambulla, approximately 22 km from historic Sigiriya. Stringent measures were taken by the Anti-Malaria Campaign to contain the focus of chloroquine-resistant *P. falciparum* malaria, which was quickly identified around the first case detected.

By 1992, there was evidence that the susceptibility level of the vector to malathion was rapidly decreasing in some districts (Records of the AMC 1992). The Anti-Malaria Campaign had already started testing suitable candidate insecticides to replace malathion in case the vector resistance increased to critical levels. In 1994 malathion had to be withdrawn from two districts. In the Kurunegala district malathion was replaced by lambda-cyhalothrin (a synthetic pyrethroid) and in the Puttalam district malathion was replaced by fenitrothion (an organophosphate). These two districts in the North Western Province contributed approximately 30 percent of

the total number of malaria cases detected in Sri Lanka during the year 1992. A dramatic reduction in the malaria incidence in the two districts was seen after the introduction of the alternative insecticides.

### **Epidemiological considerations**

In general, the degree of endemicity of malaria in different parts of the country has been largely determined by the climatic factors, which in turn, influence the vector breeding potential in an area. Three climatic zones are recognized, viz, the dry zone, the intermediate zone, and the wet zone. The endemicity in the dry zone is high, whereas it is low in the wet zone. The intermediate zone experiences the 'unstable type' of malaria, with increased transmission during dry weather when 'pooling' is seen in rivers and streams.

Considering the distribution of malaria cases in the country during the last decade, it is observed that the North Western Province and the North Central Province have been contributing the bulk of the total caseload during the first half of the decade. However, during the last years of the decade the Northern and Eastern Provinces have been recording more than half of the total country morbidity. It is reasonable to assume that constraints experienced by the Anti-Malaria Campaign in the conflict-affected Northern and Eastern Provinces caused this change. The Moneragala District too had a high incidence of malaria throughout the last decade.

### **Adoption of the Global Strategy for Malaria Control**

In July 1993 Sri Lanka adopted the *Global Strategy for Malaria Control* recommended by the World Health Organisation in 1992. Accordingly, the following actions were carried out:

1. Early detection and prompt treatment of cases.
2. Selective and sustainable control methods including vector control.
3. Mechanism to forecast and prevent outbreaks / epidemics.
4. Strengthening local capabilities in basic and applied research, to promote better understanding of the determinants of disease, specially ecological, social and economic.

### **Roll Back Malaria Initiative**

The Government of Sri Lanka is now committed to the global Roll Back Malaria Initiative (RBMI) of the WHO which is a social movement drawing its strength by improved health sector development. The operationalization of RBMI is based on six strategies, viz., enhanced diagnosis and treatment, disease transmission control, enhanced surveillance, health sector development, community mobilization, and advocacy. The districts of Jaffna, Killinochchi, Mullativu, Anuradhapura and Moneragala have been chosen for piloting of RBMI.

### **Actions for the future**

The two formidable technical problems of increasing drug resistance in the malaria parasite and insecticide resistance in the malaria vector seem major obstacles for malaria eradication in tropical countries including Sri Lanka. However, elimination of malaria mortality and prevention of severe malaria, along with a very effective degree of transmission control should be attainable objectives by the judicious use of available malaria control methods.

Maximum efforts need to be taken to prevent the emergence of multi-drug resistant strains of *P. falciparum* malaria. Application of biological methods of vector control, viz., larvivorous fish, *Bacillus thuringiensis* and growth hormone regulators have already been introduced in an attempt to reduce insecticide pressure and thereby prolong the usefulness of insecticides presently effective against the vector.

Rapid diagnostic tests for diagnosis of malaria have been introduced, specially to cover complex and emergency situations.

Participation of the community in malaria control activities is to be enhanced, specially in activities such as implementation of community based bed net programme.

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## LYMPHATIC FILARIASIS IN SRI LANKA

C. Harriet Gautamadasa

### Introduction

Sri Lanka has had two species of human filariasis caused by the parasites, *Brugia malayi* transmitted by *Mansonia* mosquitoes and *Wuchereria bancrofti* transmitted by the mosquito *Culex quinquefasciatus*. Prior to the World War II, the predominant parasite was *Brugia malayi*, which caused rural filariasis. After 1947, effective control measures considerably reduced the incidence of brugian filariasis, but areas endemic for *Wuchereria bancrofti* became more widespread.

Since 1965, no cases of brugian filariasis have been reported and the subsequent surveys conducted indicated that the brugian filariasis is more or less eradicated from Sri Lanka. The present problem is due to bancroftian filariasis endemic in three provinces, namely the Western, the Southern, and the North Western Provinces, exposing a population of 9.5 million to risk.

### Historical Review

Reference to the disease is made in the following historical writings in Sri Lanka<sup>1</sup>:

- *Vinaya Pitaka* (623-543 B.C.)– Which contains rules for ordination of Buddhist priests
- *Saratha Sangrahaya* by King Buddhadasa written in 339 A.D.
- *Besajja Manjusa* by principals of five colleges in 1300 A.D.
- *Yogaratnakara* by poet Vidu dated 1665 A.D.
- *Yoganavaya* by the principal of Mayura Pada Pirivena in 1818 A.D.

Although King Buddhadasa (339 A.D.) described the disease, its prevalence in the country at that time was not known. The earliest scientific information regarding the disease is to be found in the Ceylon Administrative Report of 1879 on cases from Kandy and Matale hospitals and the Ceylon Administrative Report of 1892 on cases reported from Matara hospital.

Historical evidence supports the view that *Brugia malayi* was introduced in the 12th and 13<sup>th</sup> century A.D. by Malays and *Wuchereria bancrofti* in the 15th century A.D. by the Chinese.<sup>2</sup>

The prevalence and distribution of filariasis was known only after a survey conducted in 1914 by Manson-Bahr.<sup>3</sup> This survey revealed very high microfilaria rates from some areas (26.6% from Toppur, 11.1% from Induruwa and 14.2% from Ambalantota). A subsequent survey in 1933 by Carter at Toppur revealed a microfilaria rate of 52%– the species identified was *Brugia malayi*.<sup>4</sup> The survey carried out by Sweet and Dirckze in 1925/1926 in the Southern province too indicated an average M.F. rate of 5.8%, heavily infected areas being Tangalle, Weeraketiya & Galle.

The surveys carried out by Bahr (1914), Sweet and Dirckze (1925) and Carter (1933) were confined to certain parts of the country. The distribution of filariasis on an island wide basis was not known until 1939 when Dassanayake completed his comprehensive survey for 2 years (1937-39).<sup>5</sup> This survey revealed the

presence of *Brugia malayi* infection in several foci in five of the nine provinces and *Wuchereria bancrofti* infection in the towns of Galle and Matara only. He reported the prevalence of brugian filariasis mostly in rural areas. Very high microfilaria rates varying from 38-54% from the Kurunegala district and moderate rates of 17.2% from the Anuradhapura district, 16.9% from the Trincomalee district and 11.6% from the Chilaw district. The corresponding figures for Galle and Matara were 8.9% and 5.1% respectively and the species identified was *Wuchereria bancrofti*. He also noted the existence of brugian infection in association with the water plant *Pistia stratiotes*.

Even though the microfilarial rates had increased very slightly in Matara and Galle, there was no spread of bancroftian filariasis between 1914 and 1939, whereas, the spread of the disease between 1939 and 1947 had been phenomenal and extensive so as to warrant recognition as a special problem by the Department of Health Services. A special campaign was established in 1947 to deal with this problem caused by the new strain of *Wuchereria bancrofti* introduced during the war years in the South Western coastal border.

In 1949, the microfilaria rates for *Brugia malayi* ranged from 1% to 18% and from 2.2 to 9.7% for *Wuchereria bancrofti*. The campaign had to cover an area of 350 square miles for brugian filariasis and 400 square miles for bancroftian filariasis, exposing a population of 0.1 and 1.5 million respectively to the risk of infection. In the case of *Brugia malayi* infection, use of Phenoxylyene '30' against the pistia plant, the use of DDT as a residual insecticide in malarial areas and the detection and treatment of cases of microfilaraemia and patients with clinical symptoms with diethyl carbamazine citrate for 7-8 years brought down the microfilaria rate to about 1% in all foci and the campaign against *Brugia malayi* infection was terminated in 1957. In the case of *Wuchereria bancrofti* infection the use larvicides such as fenthion and routine parasite control work carried out in the entire endemic area has resulted in only a moderate reduction in transmission. This is due to rapid unplanned urbanisation that has taken place during this period, which has increased the number of man-made breeding sites thereby increasing vector densities. Surveys carried out during the years 1960-1966 revealed a few cases of brugian filariasis in the Galle District, but a large-scale survey carried out by Gautamadasa during 1981-1986, revealed no cases of brugian filariasis in the country.<sup>6</sup> These findings together with reports from subsequent routine surveys indicate that brugian filariasis has been more or less eradicated from Sri Lanka and that the present problem is due to urban or bancroftian filariasis.

Since 1966, the control measures adopted were mainly directed against the parasite, where mass screening programmes were instituted by subjecting the people living in the endemic area to an annual night blood examination and the positives detected were treated with a two weeks course of diethyl carbamazine citrate and followed up for a further period of two years until they were completely free of infection. In addition, night blood examination centres were put up in most of the offices of the Medical Officers of Health where people had easy access to have their blood examined. Clinically positive patients with symptoms were treated at special clinics.

Vector control using the larvicide fenthion was confined to a limited areas—mainly municipal council areas. This was because of the temporary benefit received from larviciding and the high cost of larvicides.

Entomological control measures were adopted mainly as a monitoring and evaluating tool. By adopting these measures it was possible to bring down the microfilaria rate to 0.38% in 1997 and the infection and infective rates to less than 0.1%.

### **Setbacks**

Lack of resources— man power, money and vehicles— was a big obstacle to achieving the target. Up to 1989, the maximum coverage that was possible with the then existing manpower was about 20%. Filariasis was not considered a national priority and, therefore, the little recognition given to the importance of the control programme nationally as well as internationaly. The civil and communal riots that existed since 1983 from time to time, the establishment of Provincial Councils and subsequent early retirement of trained field officers with no replacement, created several set backs in the control programme; but with all these obstacles, continued efforts at control resulted in bringing down the microfilaria rate to 0.38% in 1997, but low level transmission continues in the entire endemic area.

### **The Present Problem of Lymphatic Filariasis and The Outlook for its Elimination**

World-wide, 120 million people are infected with filarial parasites that cause lymphatic filariasis and around a billion live in areas where they are at risk of infection. Of these, about 44 million show clinical manifestations while a further 76 million have hidden infection, most often with microfilariae in their blood and hidden internal damage to their lymphatic and renal systems.

The disease has a major psychosocial and economic impact and until recently very little could be done to alleviate the suffering and disability caused by the disease. Globally, the infection has been recognised as the second leading cause of permanent and long-term disability. Recent advances in treatment methods both for controlling transmission and for simple approaches to disease control along with new techniques for diagnosing the infection have radically altered this gloomy outlook. This has resulted in an independent, International Task Force for Disease Eradication to identify lymphatic filariasis as one of only six infectious diseases considered to be "eradicable" or "potentially eradicable". The World Health Assembly in 1997 adopted Resolution WHA 50.29, calling for the elimination of lymphatic filariasis as a global public health problem. This initiative is supported by the decision taken in 1998 by the company SmithKline Beecham to collaborate with the WHO in the elimination effort, by donating the drug albendazole, one of the drugs used in the eradication of lymphatic filariasis, free of charge for as long as necessary to ensure success of the elimination programme.

### **Recent Medical Advances**

Recent medical advances that have changed the outlook today encompass four distinct areas:

1. Treatment for interrupting transmission— With the development of new, effective, safe and long lasting microfilaricidal regimens based on once yearly, single dose, two drug treatment, focused on community-wide

treatment of the entire "at risk" population. The two drug treatment includes either albendazole plus diethyl carbamazine citrate or albendazole plus ivermectin. It will need to be continued for a minimum period of 4-6 years i.e. until the adult worm dies. If the coverage is poor, treatment for longer periods will be necessary to interrupt transmission. These methods have replaced the normal "selective treatment" of people with microfilaraemia following routine blood examination.

2. Morbidity control– i.e. to treat the people who are already suffering from clinical manifestations by way of community self-help groups.
3. New diagnostic tools for surveillance and monitoring– Evaluation of antigenaemia using ICT card test or by DNA probe surveys to detect parasite DNA in humans or in the vector.
4. Added benefits of community programmes as deworming programmes– These drugs are effective against intestinal parasites and ecto-parasites e.g. lice, scabies etc

### **Future Challenges**

Single dose mass treatment using DEC only, commenced in February 1997 in the U.C. area Kotte covering a population 150,000. Coverage was very good but since then, up to 1999 October, single dose treatment introduced in several Medical Officer of Health areas, with a high endemicity, have been carried out in an ad-hoc manner; due to various problems encountered during implementation. The biggest drawback was lack of trained persons to distribute the tablets during a short period of 2-3 days. During the year 1998, a population of 0.7 million out of 9.5 million received the tablets. In early 1999 a population of approximately 0.75 million were also treated, but these areas were selected based on the degree of endemicity and, even though the coverage in each individual area was satisfactory, the question of re-infection from neighbouring areas was unavoidable. Therefore, in October 1999, this programme was conducted as a national programme in most of the endemic areas, during which a population of approximately 0.8 million was covered. Implementation was carried out by visiting homes simultaneously with the polio mopping up operations. The second round as a national programme (after six months) was -completed in April 2000 by establishing centres. The coverage varied from 50- 70 % in different MOH areas. Of the 97 MOH areas in the endemic zone, 69 were taken up during this round, but in most instances only a part of the MOH area was covered. In the year 1998, the microfilaria rate for the entire endemic area was 0.21% and the infection and infective rates were 0.56% and 0.05% respectively showing a marked drop in the microfilariae rate, even though the infection rates remain to be static at a low level. During the year 1999, the microfilaria rate was 0.22%,

In 1997 June, a pilot project was carried out at Werahera involving a population of approximately 8000. DEC was given alone during home visits, after conducting a baseline survey. This project was continued for three years by giving DEC every six months with annual monitoring. At the end of the first year i.e. in June 1998 the microfilaria rate as well as the infection and infective rates had come down by 50% and at the end of two years i.e. in June 1999, these rates dropped by another 50%. These data suggest that if the coverage is over 80%, a

zero level of transmission could be reached by implementing the programme for 4-5 years, but if the coverage is inadequate, this period will be longer.

It is proposed to introduce the two drug regimen using albendazole and diethyl carbamazine citrate in future years.

Lack of personnel to implement the programme during a short period of time to achieve a coverage over 80% was a major draw back, therefore, social marketing, communication and advocacy will be the key elements to be pursued before embarking on this major task in future.

If the global goal of eradication is to be achieved at least by the year 2010, the total commitment of the community in support of this effort is essential.

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## THE CONTROL OF VENEREAL DISEASES IN SRI LANKA

*P L B Jayasuriya*

### **Introduction**

Venereal diseases by definition include only syphilis, gonorrhoea, chancroid, granuloma inguinale and lymphogranuloma venereum. They are diseases transmitted primarily through sexual intercourse with an infected partner.

Other diseases transmitted in the same way were recognized from time to time. These together with the classical venereal diseases came to be called sexually transmitted diseases (STD). The use of this term became fashionable with the passage of the National Health Service Venereal Diseases Regulations 1974 in the United Kingdom. These regulations extended the service provided to all sexually transmitted diseases.<sup>1</sup> The term sexually transmitted infections (STIs) is now being used by some.

STDs are transmitted from an infected person directly to a susceptible host. There is no vector. Therefore, primary prevention is by avoiding unprotected sexual intercourse with casual partners or sex workers who could possibly be sources of infection. Secondary prevention involves diagnosis and early effective treatment of the infected person and the immediate sexual contacts.

Therefore, the work of a STD clinic comprises essentially of early diagnosis and treatment, health education, and tracing and treatment of contacts.

### **History of Venereal Diseases Control in Sri Lanka**

It is reasonable to think that venereal diseases and syphilis in particular did occur in ancient Sri Lanka. But their prevalence in Sri Lanka seems to have been so low, that they seem to have been reintroduced in the early sixteenth century by the Portuguese who invaded the west coast of Sri Lanka.<sup>2</sup> Shortly before the arrival of the Portuguese to Sri Lanka an epidemic had occurred in Europe. While the Portuguese introduced syphilis, yaws was also introduced at the same time to Sri Lanka by African slaves who were brought by the Portuguese.

Measures to control venereal diseases in Sri Lanka have been in operation for about 160 years. The Vagrants Ordinance No. 4 of 1841, the Contagious Diseases Ordinance No. 17 of 1867, the Brothels Ordinance No. 5 of 1889 were passed with a view of controlling venereal diseases. The Contagious Diseases Ordinance required the registration, examination and treatment of all prostitutes, but the control of venereal diseases by this measure could not have been successful. During this period there had been three wards in Colombo, Kandy and Galle for the treatment of women suffering from venereal diseases.

In 1916, the Royal Commission on Venereal Diseases recommended that only doctors trained in venereology should treat venereal diseases. This established the speciality of venereology in Great Britain. However, in the USA, Europe and in many parts of the world including India, venereology was combined with dermatology and the specialists were designated dermato-venereologists. This remains so even today.

The Venereal Disease Commission appointed by Mr. Winston Churchill, the then Secretary of State for Colonies arrived in Sri Lanka in May 1920. As a result, venereal diseases control on an organised basis was started in 1921. Free part-time

venereal diseases clinics were organised for seamen in the Port of Colombo, for women and children in the Lady Ridgeway Hospital, Colombo and for men at the General Hospital, Colombo. Neosalvasan, a treatment used for syphilis, was made available to all government hospitals in the island.

In 1926, Sri Lanka undertook to observe the provisions of the Brussels Agreement of 1924, to provide free venereal diseases treatment for seafarers.

In 1931, a part-time venereal diseases clinic was opened at the Kandy Dispensary. By 1934 the Venereal Diseases Clinic, Colombo was functioning on all weekday afternoons. In 1937 a clinic was opened in Galle, which functioned every Saturday.

In 1938, a Venereal Diseases Control Programme was initiated by the then Department of Medical and Sanitary Services. Clinics were organised in outstation hospitals and dispensaries. The Venereal Diseases Ordinance No 27 was passed in the same year. It required that registered medical practitioners and indigenous medical practitioners with special permission only, could treat venereal diseases. But this was never put into practice.

In 1942, venereal diseases were made notifiable but again this was not implemented. In 1939, venereal diseases control was placed under a qualified surgeon, Dr. H.C.P. Gunawardene, who reorganised the control programme.

In 1941, 10 medical officers were trained for three months in Colombo. They were placed in charge of part-time clinics in outstation hospitals. By 1944, there were 23 part-time clinics, of which 13 were under trained medical officers. The training of medical officers continued and by 1948, 37 were trained but only one outstation clinic was manned by a fully trained medical officer. This was because officers were transferred without replacement by trained personnel.

Case holding was introduced in Colombo in 1941 and contact investigation a few years later. The success of follow up work was shown in Colombo by the doubling of subsequent visits between 1942 and 1948. In 1942, in the Colombo Venereal Diseases Clinic, there were 3340 first visits and 24,787 subsequent visits by males, giving 7.4 as the ratio of subsequent visits to first visits. In 1948, first visits were 3,086 and subsequent visits 51,701 giving a ratio of 16.8. This is an index of the popularity of the clinic, as these were the days when treatment was with arsenic and bismuth and case holding was more difficult than now.

In 1949, Professor George Leiby, Professor of Syphilology of the University of California visited Sri Lanka on a WHO assignment, on a request by the government of Sri Lanka. He was impressed by the work done, especially the contact investigation work in Colombo. The drawback observed was the inadequate number of trained personnel and frequent transfers of those who had specialised in the work. Ironically, this drawback still remains. Among his proposals was the establishment of 60 venereal diseases clinics, each in charge of a full-time trained medical officer with special staff.

The sulphonamides were introduced for the treatment of gonorrhoea in 1937. Within a few years they became totally ineffective. Penicillin was introduced in 1946. A low dose of 50,000 units of crystalline penicillin twice a day for one day was curative. The dose was increased when penicillin became freely available and in 1951 crystalline penicillin was replaced by procaine penicillin with aluminium monostearate (PAM).

In the treatment of syphilis arsenic and bismuth were used in the early 1920s. They were replaced by PAM in 1950.

In 1950 contact investigation and health education work was intensified. All patients attending the clinic were educated regarding the diseases, the mode of transmission, the importance of regular attendance as well as the necessity of referring contacts to the clinic. Mass education of the public was also undertaken. These efforts over 30 years, from 1920 to 1950, to control venereal diseases in Sri Lanka lacked direction and continuity.

In 1951, the Chief of the Venereal Diseases and Treponematoses Section of the WHO, Geneva visited the island. As a result, the WHO established the Venereal Diseases Control Project (Ceylon 0005), which was one of the earliest field projects undertaken by the WHO in the South East Asia Region. A venereal diseases control team under the leadership of Dr. S.M. Laird arrived in Sri Lanka in 1951. The objectives of the project were:

1. To establish a model venereal diseases clinic in Colombo, which would serve as- (a) the chief clinic for Ceylon and (b) the training centre for medical and paramedical personnel.
2. To develop a full venereal diseases service with trained staff in the main outstations.
3. To establish serological tests for expectant mothers as routine and thus to control congenital syphilis.
4. To train local staff in simple serological testing so as to provide such facilities in the main outstations.
5. To develop diagnosis and treatment facilities for seafarers in the Port of Colombo.<sup>3</sup>

Through Dr Laird's good offices the Anti-Venereal Diseases Campaign (the Anti VD Campaign) was established in 1952 with Dr. Mrs. E.D.C. Pereira as Superintendent. She was a dynamic leader, who was able to attain most of the objectives of the project. She saw to it that every type plan OPD block of a provincial hospital had rooms demarcated for a VD clinic with separate access.

The model clinic was completed and came into operation in 1952. Serological testing for expectant mothers was started as routine in Colombo in the same year. The campaign of public education was further developed. Lecture demonstrations were started for postgraduates, undergraduates and paramedical personnel.

In 1953, the eradication of yaws was also made the responsibility of the Anti-VD Campaign. Yaws by that time had receded considerably and is now no longer a problem in Sri Lanka.<sup>4</sup>

Since 1953, the Anti-VD Campaign was conducted entirely by national staff. When Dr Laird revisited Sri Lanka in 1958, he concluded, "The Anti-VD Campaign has made solid progress and the initial improvement stimulated by the WHO team in 1951-53 has been extended by the national staff during the last five years. While progress towards the chief objective varies, a good start has been made in all five and some have already been achieved."<sup>5</sup> He also found that about 55% of all new attendees in 1957 in Colombo were found to be free of venereal diseases. He said that

this is probably a good index of public confidence in the clinic and perhaps some measure of the Campaign's public educational activity.

Sixteen major outstation clinic centres was the goal earmarked in 1952. By 1958 only half of them had been established.

Selection and training of medical officers, which started in 1952, had been delayed due to the shortage of doctors. Even among the doctors trained, 44% had left the Campaign.

The new Port VD Clinic was opened in 1958. A venereologist and a medical officer visited this clinic on two afternoons a week. This clinic is no longer functional because the clinic building was taken over by the Port Authority.

In 1958, Laird stressed the need for a new laboratory for syphilis serology under a medical officer trained in serology. He preferred that this laboratory be situated in the Central Clinic. This was achieved in 1968.

In 1967, Laird revisited Sri Lanka and concluded that the five main objectives of the Project have been achieved and the Anti-Venereal Diseases Campaign has been maintained and further developed by the national staff during the last 14 years.<sup>6</sup>

In 1971, the Central Venereal Diseases Clinic (CVDC) and 11 full time VD clinics were functioning in provincial and base hospitals distributed all over the island. From each of these, the medical officer conducted a branch clinic about 25-30 miles away. At that time, the CVDC was manned by medical officers specialised in venereology. The others were conducted by medical officers who had opted for venereology as a career. They were trained for three months at the CVDC before they assumed duties at outstation clinics.

In some large hospitals part-time VD clinics were held once or twice a week by medical officers who were trained at the CVDC for two weeks.

Today we have the Central STD Clinic, 16 full-time clinics in provincial and base hospitals and 14 branch clinics. However, the target proposed by Professor George Leiby for 1952, was 60 full-time clinics for a population of 7 million people has not been achieved. Today we have 20 million people.

The 13<sup>th</sup> amendment to the constitution of Sri Lanka implemented in 1989 caused further problems for the control of venereal diseases. The Anti-VD Campaign was disbanded. The Director of the campaign who is now called the Director, National STD/AIDS Control Programme (NSACP) lost control of all the clinics except the Central Clinic in Colombo. STD clinics were never a priority concern of the government health service. The situation became worse with the outstation clinics going under the management of the provincial health services. The standard of work deteriorated. Attendance fell. Returns stopped coming to the centre regularly. Some clinics were manned by medical officers who had no training at all in venereology.

In 1996, I urged that all full time clinics be taken under the STD/AIDS Control Programme and for a start the clinics at Galle, Colombo South, Ragama, Jaffna, Kurunegala, Ratnapura and Kegalle be taken over by the Programme.<sup>7</sup> They were sited in hospitals, which were already under the control of the Central Ministry of Health. The Cabinet approval for this proposal was granted to bring these clinics under central control. However, the provincial councils are reluctant to hand them over.

## **Specialization in Venereology**

In Sri Lanka, the speciality of venereology was born in 1952 with the establishment of the Anti-VD Campaign. It was considered a finer speciality of public health.

Medical officers had to opt for a career in venereology in order to join the Campaign. A qualification for selection, was experience of two years as a Medical Officer of Health. Selected officers trained for three months at the CVDC before they were sent to man outstation clinics. Later they were sent to the UK, USA or Canada for training as specialists. They obtained a Diploma or a Masters in Public Health, and special training in venereology for six months in a centre or centres of excellence. These officers were trained abroad on WHO or Colombo Plan fellowships.

In the 1970s there was a separate cadre of venereologists, separate from the cadre of specialists in public health.

From 1980, only postgraduate qualifications from the Postgraduate Institute of Medicine (PGIM) were recognized in the government health service of Sri Lanka. The specialist qualification in venereology became the MD in Community Medicine. Initially officers who were already in the Campaign obtained the MSc and then the MD in Community Medicine. As a part of work for the MSc they submitted a dissertation on a subject related to STD. They wrote their thesis for the MD on a similar subject.

It was gradually realized that the training of a specialist in venereology was inadequate. This was best seen when a medical officer who had not worked in an STD clinic wanted to specialize in venereology. He could do a thesis on a subject related to venereology, have very little experience in care of STD patients and obtain an MD.

Venereology involves a very large component of clinical medicine. This is especially so in this era of HIV disease. The inadequacy of training of venereologists was taken up by the College of Genitourinary Physicians (later called the College of Venereologists), which was formed in 1995. First the college proposed a Diploma in Genitourinary Medicine (later changed to Diploma in Venereology) at the PGIM. Although the PGIM was supportive of this move there were difficulties in finding a Board of Study under whose aegis this could be organised. After several discussions with Board of Study in Community Medicine it was finally decided that it would be best that a Board of Study in Venereology be formed. The PGIM and the University Grants Commission have accepted this proposal. The Board of Study in Venereology will be formed soon. It will initially organise the Diploma in Venereology and later a MD. For an interim period the MSc and MD in Community Medicine with special work in venereology will continue as the recognised qualifications in the field.

## **The pattern of sexually transmitted diseases**

The classical venereal diseases were syphilis, gonorrhoea, chancroid, granuloma inguinale and lymphogranuloma venereum.

Of these, syphilis was the most important because in its later stages it affected almost all systems of the body. Before the advent of penicillin, cardiovascular syphilis and neurosyphilis were causes of considerable morbidity and mortality.

Gonorrhoea was the next important. It was the most common cause of discharge per urethra. However non-gonococcal urethritis (NGU) also called non-specific urethritis (NSU) became commoner than gonorrhoea, as a cause of urethritis, by the 1970s.

Over the years the pattern of diseases shifted from bacterial to viral, from curable to treatable but incurable.

By the 1970s, even in Sri Lanka, the most common cause of genital ulceration was herpes simplex infection.<sup>8</sup>

The 1980s saw the advent HIV infection. This changed the whole scene of venereology. The speciality, which was in the backwoods, became a high profile one. In developed countries HIV/AIDS attracted money and dynamic doctors to the speciality. New purpose built clinics replaced those housed in basements and rundown buildings.

Today although the bacterial infections, syphilis, gonorrhoea and NSU remain they have been outnumbered by viral infections, herpes simplex, papilloma virus and HIV.

### **The Treatment of Sexually Transmitted Diseases**

Before the advent of penicillin in the 1950s the treatment of syphilis and gonorrhoea was not satisfactory. The drugs used were toxic and had little effect.

In the treatment of syphilis arsenic and bismuth were used in the early 1920s. They were replaced by penicillin in 1950. *Treponema pallidum*, the aetiological agent of syphilis still remains sensitive to penicillin.

Gonorrhoea resulted in urethral strictures in men. Dilatation of the urethra was common procedure in VD Clinics. The sulphonamides were introduced for the treatment of gonorrhoea in 1937. Within few years they became totally ineffective. In 1946 penicillin was introduced. A low dose of 50,000 units of crystalline penicillin twice a day for one day was curative. The dose was increased when penicillin became freely available and in 1951 crystalline penicillin was replaced by procaine penicillin with aluminium monostearate (PAM). In contrast to the treponeme of syphilis the gonococcus became resistant to many antibiotics. Penicillinase producing *Neisseria gonorrhoea* emerged in the Far East in the 1970s. The choice of antibiotics for the treatment of gonococcal infections has to be on laboratory-based surveillance. This activity is carried out by the Central Laboratory of the NSACP, which participates in the global Gonococcal Antimicrobial Susceptibility Program initiated by the WHO.<sup>9</sup>

Herpes simplex infections could be treated with acyclovir and the newer drugs of the same class. But it cannot eradicate the virus.

There is no treatment to eradicate the papilloma virus, which is implicated in the etiology of carcinoma of the cervix.

Drugs have retarded the progression of HIV disease. But no cure or vaccine would be available in the near future.

### **The College of Venereologists of Sri Lanka**

The College of Genitourinary Physicians of Sri Lanka was inaugurated in October 1995. The name was later changed to the College of Venereologists. The College has been active and been able to unite people working in the speciality. Annual Academic Sessions have been held for four years. The proceedings of these sessions have been published. The College has been concerned with standards in venereology. It has pioneered the formation of a Board of Study in Venereology.

## **The Present and the Future**

The responsibilities and the scope of the NSACP has widened since HIV/AIDS prevention was incorporated to the existing STD control programme. The NSACP coordinates the National AIDS prevention programme of Sri Lanka and provides technical assistance to all stakeholders. The Central STD clinic and laboratory in Colombo function as the National Reference Centres for STD diagnosis and management. The Central STD Clinic Colombo is a training centre for the MD Community Medicine training programme of the PGIM and the NSACP trains medical undergraduates and postgraduates (in family medicine, child health, obstetrics and gynaecology), as well as nursing officers, public health inspectors, medical laboratory technicians and microscopists. In the future it will be the main training centre for the Diploma in Venereology and the MD in Venereology.

In addition to the Central STD Clinic there are 16 STD clinics situated in provincial and base hospitals and 14 branch clinics.

In 1996, the World Bank committed the major part of its funds under the Health Services Project (IDA/WB/HSP/SL) to strengthen the NSACP. The major part of this investment of Rs. 602 million was for the construction of the modern four-storied Central STD Complex in Colombo and 21 upgraded or newly constructed provincial hospital or base hospital clinics.<sup>10</sup>

The Central Complex, which has already been completed houses the office of the Director, clinics, National Reference Laboratory, auditorium, library, audiovisual and health education center, pharmacy and pre-employment medical screening center.

Due to the limited availability of data on the prevalence of STD and their complications the burden of these diseases is substantially underestimated. STDs are not notifiable in Sri Lanka. However, the epidemiological patterns of these diseases could be inferred from the data reported to the clinics of the NSACP. In 1991, two visiting WHO consultants Drs Frank Judson and John Gallway, estimated that around 200,000 new episodes of STD occur annually of which only 10-15% are seen in government STD clinics. Most persons with STD seek treatment in the private sector where no statistics are reported to the NSACP.

Genital herpes, syphilis, non-gonococcal infections, gonorrhoea and trichomonas infections are the most frequently reported STDs. A rising incidence of genital herpes has been noted during the last 5 years. It constituted 21% of STDs reported to the NSACP in the year 2000.<sup>11</sup>

The first Sri Lankan infected with HIV was reported in 1987 and the first indigenously transmitted case was reported in 1989. Since then up to December 2000 the cumulative number of HIV cases reported to the NSACP was 358. Of these 119 had AIDS. Reported AIDS deaths are 89. Sentinel surveillance studies conducted since 1993 have confirmed that Sri Lanka remains a country with low prevalence of HIV infection.<sup>12</sup>

## **Syndromic approach to management**

The Anti-VD Campaign was British oriented. The idea was to have a system of clinics under control of specialists. The practice in these clinics was to make an aetiological diagnosis backed by laboratory findings and then to manage the patient on national guidelines. These required high level of training and a large number of medical officers.

In Sri Lanka this system worked satisfactorily till the late 1970s when all the provincial STD clinics and some base hospital STD clinics were staffed by specialists or trained medical officers who had opted for a career in STD. This era was followed by a period of decline when several full time clinics folded up due to an exodus of trained manpower. It was realised that while the incidence continued to rise STD services were not accessible to the vast majority of people.

The global concern regarding the continued spread of STDs lead to a change in strategies first discussed in the 1980s. The WHO consultation in 1990 lead to the WHO Technical Report Series No. 810, which illustrated the algorithms of the syndromic approach to management of STDs.<sup>13</sup> This strategy provided for the management of STDs at the first point of contact with the health care system. There was no referral to any other clinics unless it was clearly specified in the flow charts.

The modules were first tested in Sri Lanka in 1995. Each syndrome uses a clinical algorithm based on patients presenting symptoms and clinical signs to determine antimicrobial therapy. The Ministry of Health has endorsed in principle that syndromic management be included in the strategy in the prevention and control of STDs. The NSACP has already trained medical officers at PHC level in Kurunegala District, and in the army and the police. It has produced a Manual on STD treatment.<sup>14</sup>

There is no shortage of medical officers in the government health service now. Moreover the government has pledged to absorb all new medical graduates till 2010. A draft has been prepared by the Department of Health regarding the needs of specialists by the year 2010. This document envisages STD clinics in Type A Base Hospitals, Type A District General Hospitals, Type B District General Hospitals, Provincial Hospitals and Teaching Hospitals to be manned by specialists. The number needed is 47.<sup>15</sup>

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## TUBERCULOSIS IN SRI LANKA

*Chandra Pitigala*

### **Historical Background**

Measures to control tuberculosis were introduced by the colonial rulers as far back as 1916 when the Anti-Tuberculosis Institute was opened in the Pettah. Subsequently, chest hospitals were established at Ragama and Kandana in 1917 and 1918 respectively; another chest hospital was established, in 1937, in Welisara. Recognising the need for a more concerted effort in the control of tuberculosis the government established the Anti-Tuberculosis Campaign in 1945.<sup>1</sup> The Anti-Tuberculosis Campaign (ATBC) functioned as a centrally administered special programme under a Superintendent, (later designated the Director of the Campaign). A BCG Campaign was started by the ATBC in 1949 to vaccinate those who were found to be 'mantoux negative'. This programme paid special emphasis to BCG vaccination of school children. BCG vaccination of newborn infants commenced in 1963 to prevent the occurrence of tuberculous meningitis and miliary tuberculosis in childhood. Mass Miniature Radiography was introduced in 1950, and it was observed that about one percent of the employed adult population showed signs of tuberculosis.<sup>2</sup>

Mr Donald Barlow, and eminent British Thoracic Surgeon visited Sri Lanka to report on the thoracic services with special reference to tuberculosis, in 1952. The recommendations contained in his report were adopted by the government and implemented by the ATBC. On a subsequent visit two years later, Barlow reported, 'Great strides have been taken both in prevention and care.... The Government of Ceylon has realized that tuberculosis is a curable and preventable disease and has attacked the problem with vigour and determination. No government could have been more alert to its responsibilities.'<sup>3,4</sup>

Among the recommendations made by Barlow were the following:

- To rapidly erect light construction wards for the accommodation of tuberculosis patients in hospitals.
- To establish chest clinics.
- To train personnel- doctors, nurses, health visitors and other paramedical personnel.
- To make arrangements for public education in tuberculosis.
- To make provision for domiciliary treatment of patients.

Based on his recommendation chest wards, chest clinics and branch clinics were established in many parts of the island. Today, there are 14 chest wards in government hospitals, 21 chest clinics and 34 branch clinics.

### **Recent Developments**

Tuberculosis was declared a "global emergency" by the World Health Organisation in 1993, as even developed countries were getting devastated by the increasing numbers of patients with tuberculosis. The advent of HIV/AIDS made the situation even worse, as TB became the commonest infection contracted by such immune-compromised patients, especially in Asian and African countries. The evolving Multi-

Drug Resistant (MDR) strains have made this disease a fatal one due to the non-availability of an effective regimen of drugs (and the prohibitive costs of those available) for such patients. The WHO has now recommended "DOTS" (Directly Observed Treatment, Short course) as the ideal treatment for TB patients. This means that a doctor, nurse or trained health worker observes the patient swallowing the daily dose of medicine to ensure compliance.

### **Achievements**

Over the years Sri Lanka has managed to reduce the morbidity and mortality from tuberculosis considerably. This was achieved by making free diagnosis and treatment available throughout the country with initial indoor treatment at a local hospital close to the patient's home. Financial assistance, a small monthly allowance given by the Social Services Department to needy patients who were certified by the district TB control officer to ensure regular visits for treatment, and six months of paid medical leave given to those employed, acted as incentives to achieve completion of treatment and cure. In addition, a successful BCG vaccination programme has brought about reduction of childhood TB.

Regular training (local and foreign) and refresher courses for staff -District Tuberculosis Control Officers (DTCO), public health inspectors and medical laboratory technologists- have kept them updated with current information on the subject and enabled them to provide a better service to patients. While diagnosis is made with x-rays, sputum smear and culture, the treatment has been changed from a drug regimen lasting 2 years, 1½ years, 1 year to 6 months in 1988, using the currently accepted short course (2RHEZ/4RH), even before it was globally accepted. More importantly DOTS has been practiced in Sri Lanka during the initial intensive phase (two months) of treatment from many years ago, by admitting the patients to a TB ward.

### **Constraints**

The TB control programme has many set backs:

- Drug collection for the peripheral chest clinics, done at present by the divisional drug stores, has been erratic at times, making DOTS ineffective.
- Many TB wards have been closed down or handed over to general physicians, by the provincial authorities making this specialised programme ineffective.
- Trained and qualified DTCOs are being replaced by new medical officers, causing a breakdown in the chest clinic services.
- Central supervision is inadequate due to lack of staff at the centre.
- Inadequate supervision of DOTS due to lack of transport for the DTCO.
- Shortage of important staff such as microscopists and public health inspectors, disrupts diagnosis and follow up of defaulters.
- Inadequate assessment of already functioning DOTS programmes, delays remedial action and improvement of the quality of new ones.

### **The Present Scenario**

Morbidity and mortality from tuberculosis has shown a steady decline over the years- from 88 per 100,000 in 1962 to 30 per 100,000 in 1999. At present about 6,000 to 6,500 cases are notified every year. However, there are no statistics from the private sector although notification is a legal requirement. The estimated incidence of all TB

cases in Sri Lanka is 11,000 (WHO global report 1999). The case detection rate in Sri Lanka is, therefore, only 63 percent and needs to be improved.

All diagnosed TB patients are treated with short course chemotherapy (SCC). New cases are treated with 2RHEZ/4RH (2 months of intensive treatment with rifampicin, INAH, ethambutol and pyrazinamide, followed by 4 months of rifampicin and INAH).

Retreatment cases (i.e. relapses, treatment failures and sputum positive returns after default) are treated with 2RHEZS/IRHZE/5RHE.

Treatment is monitored by follow up sputum smear examinations at specified intervals.

The DOTS strategy has been implemented in six districts, starting from Galle in 1997, in Colombo, Gampaha, Matara, Kandy and Anuradhapura.

The STD/AIDS programme has been carrying out a regular sentinel survey of new TB patients in Colombo, Galle and Kandy patients over the past few years.

### **Future challenges**

Multi-Drug Resistant tuberculosis (MDR TB) is the greatest challenge faced by every country. Sri Lanka is no exception. It is fatal as there are no effective drugs; the available drugs give no guarantee of a cure, and are totally inaccessible to developing countries in terms of cost. The only way out of this situation is to see that all diagnosed cases are cured by DOTS and not allowed to proceed to the stage of MDR TB.

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## LEPROSY CONTROL IN SRI LANKA

*W A S Settinayake and H M S S D Herath*

### **Early Control Efforts**

The history of leprosy control in Sri Lanka dates back to the eighteenth century when the Dutch who were in control of the maritime provinces established the Lepers Asylum (now the Leprosy Hospital) in Hendala for the segregation of patients suffering from leprosy. It is probable that this asylum was the first of its kind in the East. With the British taking control of the maritime provinces in 1798, the administration of the asylum came under the British military administration and later, in 1868, under the Civil Medical Department, which was established in 1858.<sup>1</sup> The main mode of leprosy control was the segregation of patients, which was made compulsory, in 1901, by the enactment of the Lepers Ordinance No. 4. A second leprosy asylum was set up on the island of Mantivu off the eastern coast of the island, in 1920.

### **First Leprosy Survey**

In 1930, the Director of Medical and Sanitary Services drew attention to the need for conducting a survey to determine the magnitude of the problem of leprosy, in view of its growing importance as a socio-economic problem. In 1931, the Executive Committee of Health approved a proposal to send two medical officers to India for training in leprosy control to Chingleput, India. On their return to the island they carried out a survey of the known cases of leprosy and formulated a scheme for leprosy control in the island.<sup>1</sup>

### **Review of Leprosy Situation**

In 1933, the services of Dr R.G. Cochrane, the Medical Secretary of the Empire Leprosy Relief Association was sought by the Executive Committee on Health to review the leprosy situation in Ceylon and make recommendation on its control. Dr Cochrane visited Ceylon in the same year and recorded, amongst other things, that the care of the arrested cases and those needing surgical attention was inadequate and that there was a dire need for palliative surgery to remove necrotic bones and deal with other conditions so common in deformed cases. He also commented on the reluctance of patients to permit even the most elementary surgical interference, but that these obstacles could be overcome by providing the necessary facilities and demonstrating the benefits of surgical intervention to alleviate trophic conditions in advanced nerve cases.<sup>2</sup> Dr Cochrane visited the island again, in 1936, during which visit he observed that more patients were ready to have trophic conditions treated surgically. This new attitude was attributed largely to the untiring efforts of Dr Milroy Paul<sup>3</sup> (a future Professor of Surgery of the University of Ceylon). Dr Cochrane paid his third visit in 1951 to assess the further progress of the leprosy control programme and to ascertain the possibility of introducing bacteriological, pathological, and orthopaedic and other treatment techniques in the campaign against leprosy. His recommendations included the institutional segregation of only infective cases, the rehabilitation of discharged patients, a special children's home for leprosy patients, a special home for crippled leprosy patients, employment of suitable infective leprosy cases in leprosy hospitals in place of attendants, lepromin testing, BCG vaccination and the treatment of suitable patients in local hospitals and dispensaries and in their homes.<sup>1</sup>

## **Establishment of the Anti-Leprosy Campaign**

In 1954, the World Health Organisation agreed to assist Sri Lanka in implementing Dr Cochrane's recommendations by providing a leprosy specialist, a pathologist with experience in bacteriology and an occupational therapist. In July 1954, Dr B.C. Malhotra, Senior WHO Officer in the Leprosy Project arrived in Sri Lanka as a consultant; an occupational therapist arrived towards the end of the year. In the same year the Anti-Leprosy Campaign was established as a centrally controlled campaign to plan, implement, coordinate and evaluate leprosy control activities in the island. Domiciliary treatment of non-infective leprosy patients began with the establishment of the Anti-Leprosy Campaign.

## **Leprosy Colony for Rehabilitation of Patients**

A Leprosy Colony was set up at Urugaha in the Southern Province for the rehabilitation of able-bodied patients by engaging them in agricultural work. A textile centre at Urugaha and a sandal-making centre at Hendala were other occupational activities set up, in 1955, by the occupational therapist to further expand facilities for occupational rehabilitation. Dr Malhotra, who served in Sri Lanka for three years, stressed the importance of rehabilitation and occupational therapy in his final report. He observed that whilst some progress was made in providing facilities for occupational rehabilitation, little progress had been made towards improving facilities for physical rehabilitation.<sup>4</sup> The Urugaha Colony was closed in 1963 due to the villagers objecting to its further continuance in the area.

## **Role of Public Health Inspectors in Leprosy Control**

In 1970, trained Public Health Inspectors (PHIs) were appointed (one for each district) to implement the field programme of the Campaign. They were actively involved in conducting clinics, village surveys, contact surveys, default retrieval and educational programmes. From this time onwards, the Anti-Leprosy Campaign functioned with three medical officers working at the centre and 25 PHIs working in the districts.

## **Domiciliary Care of Non-infectious Patients**

Compulsory admission of patients to the leprosy hospitals under the provisions of the Lepers Ordinance was discontinued from 1977; from then on non-infectious patients were treated at home.

## **Introduction of Multi-drug Treatment**

Financial and material support granted by Leprosy Relief Work Emmaus, Switzerland, from 1983, enabled Sri Lanka to introduce the multi-drug treatment (MDT) regime. Sri Lanka achieved 100 percent coverage of all her registered patients the same year. However, it was evident that transmission of the disease had not been effectively interrupted as 19 percent of new patients were found to be children and 20 percent of new patients were found to be suffering from multi-bacillary leprosy.

## **Social Marketing Campaign**

In her Administration Report for 1988, the Director, Anti-Leprosy Campaign remarked, 'A change in the attitude towards leprosy is required to make a real difference to the leprosy situation in Sri Lanka. Consequently the only viable option is to launch a social marketing campaign in order to de-stigmatise leprosy, create an

awareness of the early signs of the disease and encourage patients to seek treatment'.<sup>5</sup> This expectation was realised when the Ciba-Geigy Leprosy Fund, now Novartis Foundation for Sustainable Development (NFSD), joined Leprosy Relief Work Emmaus, in 1989, in support of leprosy elimination activities. NFSD funded a highly successful Social Marketing Campaign, launched in 1990, aimed at educating the population on leprosy and removing the stigma attached to the disease. As a consequence, case detection dramatically increased by 150 percent, and self-reporting increased from 9 percent in 1989 to 50 percent in 1991.<sup>6</sup>

### **Elimination Target Achieved**

With increased community awareness achieved through the social marketing campaign, a large number of undetected cases presented themselves for treatment, and Sri Lanka was able to reach the WHO Elimination Target of less than one case per 10,000 population, in 1995. Although the target has been achieved at national level, there remain a few health divisions, particularly in the Western and the Eastern Provinces, where the elimination target has yet to be achieved.

### **Integration with the General Health Services**

On January 1, 2001, leprosy control activities will be integrated with the general health services. The final objective would be to sustain the achievements gained so far, and to eliminate leprosy in the few remaining health divisions where the target has not yet been achieved.

### **Conclusion**

Sri Lanka's achievement in the elimination of leprosy can be attributed to the dedicated service rendered by a group of committed workers. It is noteworthy that the district programmes were implemented by Public Health Inspectors specially trained in leprosy control— a feature unique to the Anti-Leprosy Campaign where the services of medical officers were available only at central level. The financial and managerial support given by two international non-governmental agencies— Leprosy Relief Work Emmaus and Novartis Foundation for Sustainable Development— and the technical assistance given by the World Health Organisation over the years helped in no small measure in achieving success.

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## COMMUNITY MEDICINE IN UNDERGRADUATE AND POSTGRADUATE MEDICAL EDUCATION

*Dulitha N.Fernando*

The history of undergraduate medical education in Sri Lanka dates back to 1870 with the establishment of the Colombo Medical School. Even though the need for a medical school was pointed out by Sir George Anderson in 1852, no action was taken to establish such an institution for many years. In 1869, Dr. Loos, the Colonial Surgeon of the Northern Province drew attention to the need for providing medical education in Ceylon in order that medical assistance might be more generally available based on the inquiry made into the "prevalence of an obstinate and loathsome disease in the island in the 1860s which led to misery and suffering of natives and depopulation of the Wannai districts".<sup>1</sup>

At the time of its establishment, the School had three departments, 25 students and the duration of the course was three years. With the elevation of the School to the status of a College in 1880 the duration of the course was extended to four years and later to five years in 1884.<sup>2</sup>

Even though there are no documents indicating details of the curriculum of the medical training at the time of establishment of the school, there is some indication that aspects related to public health and preventive medicine were taught, even during the early years of medical education. Dr. W. R. Kynsey who was the Principal Civil Medical officer during the period 1875 - 1897, praised the Ceylon Medical College for 'producing doctors who were able to successfully control epidemics in the country'.<sup>3</sup>

Reminiscences of the "graduates" of the time also indicate that the concepts of public health were included in the medical curriculum early. Wijerama<sup>4</sup> recalls his days in the medical school from 1916 to 1922 and refers to the teaching of hygiene in the fourth year by the Medical Superintendent of the General Hospital, Colombo while Rajasuriya (1934 - 39) refers to the teaching of public health in the fourth year and describes his experiences during this training as 'quite comprehensive and of practical interest'.<sup>5</sup>

With the establishment of the University of Ceylon under the Ceylon University Ordinance No. 20 of 1942, the school acquired University status and was incorporated in the University of Ceylon as the Faculty of Medicine. With this change, the degree awarded by the College i.e. LMS Ceylon was converted to the degree MB BS Ceylon. At this time, the Faculty of Medicine had six departments and the teachers of Public Health were under the Department of Medicine.<sup>1</sup>

The Calendar of the University of Ceylon for the Sessions 1948 - 49 provides details of the teaching of Public Health at the time.<sup>1</sup> Teaching was carried out during the fourth year of the medical curriculum and included 30 lectures and a series of demonstrations. The broad content areas included: vital statistics, public health administration, sanitation, control of communicable diseases, maternal and child health and school health. Practical exercises in statistics and epidemiology were also included. The evaluation was held at the end of fourth year as a component of the third MBBS examination.

The first resident training program in public health of two weeks duration was introduced with the batch 1942 – 47, in Kalutara. This programme is described as intensive, well organized and 'an enjoyable break in new surroundings'.<sup>6</sup>

A separate Department of Public Health was established in the Faculty of Medicine Colombo in 1949 and Professor O.E.R.Abhayaratne was appointed as the first Professor of Public Health in 1949. He served in this capacity until his retirement in 1968 when he was succeeded by Professor T.E.J. de Fonseka.

### **Undergraduate medical education in recent decades**

The Faculty of Medicine, University of Ceylon established in Colombo was the only institution for training of medical undergraduates until 1962, when a Faculty of Medicine was established in Peradeniya as the Second Medical School of the University of Ceylon. Two more Faculties of Medicine, in Galle and Jaffna were established in 1978/79. The most recent additions to the undergraduate training facilities are the Faculty of Medicine, University of Kelaniya established in 1991 and that at the University of Sri Jayawardenapura in 1993. Accordingly, the number of undergraduates admitted for medical studies annually, increased from about 150 in late 1950's to approximately 900 in the late 1990s.

From the inception of undergraduate medical training, the curriculum was based on the British model. With reference to the Faculty of Medicine of the University of Ceylon, it is stated that "the scheme of studies in the 'professional schools' is primarily determined by the professional needs; the Faculty of Medicine in particular has to follow the general lines of the recommendations of the General Medical Council of the United Kingdom".<sup>7</sup> No major changes took place in the basic structure of the undergraduate curriculum and the 'British model' was extended to all the other medical faculties. Under this system, the duration of the training was five years and was broadly divided into preclinical,

paraclinical and clinical teaching. These curricula were subject-based with limited integration.

### **Teaching of Public Health/Community Medicine in undergraduate medical education**

The changing concept of public health had an important influence on the teaching of the subject in the medical curriculum. In the early part of the 19<sup>th</sup> century, public health focused on the improvement of the environment and on control of disease. During the latter part of the same century, the focus shifted to include 'the art and science of health promotion, disease prevention and disability limitation'. In the 1960s, social and behavioural aspects of disease and health were given a priority and by the late 1960s the discipline became identified as that dealing with health care for populations, focussing on measuring their health needs, planning and administering services to meet those needs i.e. focus on the health of the community. These changes brought in new dimensions to the teaching and practice of public health, globally.<sup>8</sup>

In the undergraduate medical education in Sri Lanka, the responsibility for teaching Public Health is undertaken by a separate department, established in each of the Faculties of Medicine. It is interesting to note the manner in which the changes in the concept of public health influenced the 'naming' of these departments. The first Department established in 1949 in the Faculty of Medicine, Colombo was named as the Department of Public Health, which was changed to Public Health and Preventive

Medicine in early 1960s. The Department of Public Health and Preventive Medicine established in the Second Medical School in Peradeniya in 1963, changed its name to the Department of Preventive and Social Medicine within a few years of its establishment. A further change took place in the mid 1970s, when the departments in Colombo and in Peradeniya were re-named as Departments of Community Medicine.

In the Faculties of Medicine at Galle and Jaffna, which were established later, the relevant department was named as the 'Department of Community Medicine' from the inception. Faculties in Kelaniya and Sri Jayawardenapura introduced the teaching of Family Medicine/General Practice at departmental level and the staff responsible for these programs were included along with those who taught Community Medicine. These departments were named as Departments of Community and Family Medicine.

The availability of a 'University Community Health Project Area' (UCHP) attached to each of the Universities is an important development that took place with the establishment of these Departments. One of the objectives of the UCHP areas is to serve as a centre for field teaching and training in Community Medicine.

The aim of undergraduate medical education is to produce a basic doctor who will serve the community, in different capacities. Teaching of community medicine at undergraduate level has to be considered in relation to the above goal.

Until the mid 1960s, this 'subject' was taught in the third and the fourth years in the undergraduate medical curriculum and was evaluated at the end of year 4. For a brief period of 3 years, the evaluation of Public Health/Community Medicine was undertaken in the final year as Part I of the Final MBBS examination. In the late 1960s and early 70s, several changes were made in the content and the teaching methods which varied between Faculties.

In the early years of medical education, lectures, tutorials and field visits were the teaching methods used in the teaching of public health/community medicine. Within the traditional curriculum, several innovative approaches have been introduced in the past few decades, some of which are described in the sections to follow.

The *Family attachment/Social Paediatrics programme* jointly undertaken by the Departments of Community Medicine and Pediatrics was introduced in the Faculty of Medicine, Colombo from the early 1960s. The objectives of this program were to provide an opportunity for the students to: identify medical, social and environmental problems relevant to the family they are allocated to; study the health services available to the family and their utilization and factors influencing all the above; and to plan and implement activities that will enhance the health status of the family. Though subjected to several modifications, this programme continued as a part of the training in Community Medicine, integrated with a clinical discipline. Other Faculties of Medicine also implemented similar programmes, and the introduction of a scheme of evaluation whereby marks were allocated to each student on the basis of their performance gave an added impetus to the programme and to the importance of the learning experience. Details regarding the implementation of the programme and the evaluation varied between faculties.

A *Community Medicine clerkship* of one-month duration was introduced in 1977/78 at the Faculty of Medicine, Colombo. During this period, the students were given an opportunity to participate in all activities of a health unit (field-based and clinic-based activities) and were provided with an opportunity of working with the members of

the health care team. In addition, students participated in a series of seminars which focused on common health related problems in community settings.

*Community based research* is another new feature introduced along with the Community attachment clerkship. Small groups of students are given an opportunity to plan and carry out a research project and prepare a report and make a presentation, applying their knowledge of basic epidemiology and statistics.

Implementation of all the programs described above was facilitated by the availability of UCHP areas attached to each of the Departments.

Though outside the formal teaching in Community Medicine, *integrated ward classes* included in the final year Professorial appointments makes an important contribution to the student's understanding of the relevance of factors in the environment, in the family and in the health seeking behaviour in the causation of disease as well as in the management of a patient.

The document on the Curriculum of the Faculty of Medicine, University of Colombo 1986<sup>9</sup> which describes the content of the teaching of Community Medicine enables the identification of the main changes that took place in the content, teaching methods and the time allocation, over the previous decade. Introduction of occupational health, broadening the teaching of maternal and child health to that of family health care, emphasis on health promotion and prevention of non-communicable diseases are among the main changes in the content while the use of the teaching methods described above contributed to the varied approaches used in teaching this subject.

At present, the Faculties of Medicine in Galle, Sri Jayawardenapura, Kelaniya and Jaffna have also included similar programmes in their training in Community Medicine, while the Faculty of Medicine, Peradeniya has a family attachment programme and a clerkship but does not include a research project.

Recent years have seen more innovative changes in the teaching methods in Community Medicine, implemented within the 'traditional' curriculum. These include: a *Community Attachment Programme* introduced in place of the Family Attachment, at the Faculty of Medicine, Galle, a *Community Health Project* in the Faculty of Medicine, Jaffna and a *Home Area Project* introduced at the Faculty in Sri Jayawardenapura. Though there are differences in the objectives of these programmes and the methods of evaluation, they all aim to provide opportunities for community based learning.

A major change in the undergraduate medical curriculum from the traditional British model was made in the Faculty of Medicine, Colombo with the introduction of *the new curriculum* in 1995. This curriculum envisages a more integrated, student-centered approach to medical education and is organized in five streams i.e. Basic Sciences stream, Applied Sciences Stream, Community Stream, Behavioural Sciences stream and the Clinical Sciences Stream, spread throughout the undergraduate training.<sup>10</sup>

With the introduction of the new curriculum, major changes took place in the teaching of the content included in the teaching of Community Medicine. Due to the integrated nature of the curriculum, some content areas which were taught in Community Medicine were included in the Applied Sciences stream, for example the epidemiology and prevention of cardiovascular diseases is now being taught in the module on cardiovascular system, principles of prevention of communicable diseases are included in the infectious and parasitic diseases module.

The teaching program in the Community Stream commences in Term 2 and continues till the end of the MB BS course. Objectives of the Community Stream were developed based on the objectives of the undergraduate medical education and the mission statement of the faculty. Teaching activities include: theoretical inputs, a Community Attachment, a Family Attachment and a research project.

Continuing the teaching of concepts relevant to Community Medicine during the final year and evaluating these inputs at the end of the course is an important feature in this curriculum. The teaching activities carried out in Year 5, in parallel to the professorial clinical appointments focus on: recognizing the social, environmental, family and community determinants on the occurrence and management of a clinical situation; identifying the impact of community and family interventions; learning successes and failures in primary care and referral mechanisms; and sensitizing students to the aetiology and management from a community perspective. Use of 'case studies' linked with group work and student presentations is the main teaching method adopted in this program.<sup>11</sup>

As described above, teaching of the concepts in Community Medicine is currently being undertaken in the different faculties using different approaches. Focus of teaching has changed in keeping with the changing concepts, with more focus on community based/ community oriented medical education through health promotion and more specific targeted interventions, to improve the health of people.

At the undergraduate level, where development of basic clinical skills form an important component of the training, linkages between clinical teaching and the teaching of community medicine are essential to make the students understand the balance between a person-centered approach to a population-based approach.

### **Postgraduate medical education in Community Medicine**

With the establishment of the Faculty of Medicine, University of Ceylon in 1942, several postgraduate training programs were initiated. The programs leading to the Diploma in Tropical Medicine and Hygiene (DTM&H), Diploma in Child Health and the Diploma in Chest Diseases had inputs in public health to varying degrees.<sup>1</sup>

The first postgraduate course in Community Medicine was conducted by the Faculty of Medicine, University of Peradeniya in 1974/75 leading up to the award of the Master of Medical Science in Community Medicine. The duration of this programme was one year and included nine months of course work (including preparation of a dissertation) followed by a study tour of three months duration, in the South East Asian region. Seven medical officers participated in this programme. This programme was discontinued thereafter.

The organizational structure to implement a programme of postgraduate medical education in Sri Lanka was first established in April 1974 by the Institute of Postgraduate Medicine Statute No.1 of 1974, made under the University of Ceylon Act No.1 of 1972. This was re-established in May 1979 by the Postgraduate Institute of Medicine Ordinance No. 2 of 1979 and subsequently by the Postgraduate Institute of Medicine (PGIM) Ordinance No.1 of 1980 under the Universities Act No.16 of 1978.<sup>1</sup> The Board of study in Community Medicine was one of the first Boards of Study to be established under the PGIM.

Postgraduate training in Community Medicine aims at training personnel who are able to function as specialists in Community Medicine in varied positions in the health system. A specialist in Community Medicine may be called upon to serve in a given

capacity on one of the several sub-disciplines within community medicine e.g. MCH, Epidemiology, Health Education and Health Administration.

The first postgraduate program to be implemented by the Institute of Postgraduate Medicine (and continued under the Postgraduate Institute of Medicine) was that leading to the Doctor of Medicine in Community Medicine, which commenced in early 1978. This program included four Parts: Part I- experience in a health unit (1 year); Part 2- full time course work (1 year); Part 3- field based research and submission of a thesis (2 years), Part 4- overseas training with a focus on a sub-discipline (9 months to 1 year).

The MD program continued until 1987, when it was decided to introduce a two-tiered system of postgraduate training, at Masters level (MSc Community Medicine) and at the doctoral level (MD Community Medicine).

The MSc Community Medicine programme includes a full time course of three terms duration and preparation of a dissertation. The course includes course units and clinical attachments. To enter the MD programme, the applicants should have obtained the MSc Community Medicine degree and have a minimum of one year's experience in a public health post. Thus, the MSc and the MD programmes could be considered as a continuum<sup>13</sup>.

With the introduction of the two-tiered system, the MD program was re-organized to include three parts.

- Part I - Course work of 3 months.
- Part II- Attachment to a training unit of 1 year and 9 months and conduct of a research study based on which the trainee has to submit a thesis. During this period the trainee has to undertake a series of rotational attachments to specialized units, undertaking service activities related to community health programmes.
- Part III - Overseas training of 9 months to 1 year.

Since the inception of the postgraduate training programmes in Community Medicine, a total of 188 medical officers have obtained the MSc Community Medicine and 107 have been awarded the MD Community Medicine, as of end 1999.

A postgraduate training program leading to MSc Health Education was introduced in 1984, under the Board of Study in Community Medicine with the aim of training persons with expertise in health education. Three such courses have been conducted so far, and 34 trainees have successfully completed the programme.

A MSc/MD training programme in Community Dentistry commenced in 1992, with the aim of training specialists in Community Dentistry. A total of 18 dental surgeons have successfully completed the MSc programme. As of end 1999, one trainee has completed the MD training programme while four others, are in different stages of the MD programme.

An increased demand for postgraduate training in the field of Community Medicine has been observed in recent years, with more than 80 applicants appearing for the qualifying examination even though the number who could be accommodated in the program is limited to approximately 35.

The Board of Study in Community Medicine has periodically reviewed the training programs in keeping with the changing needs, and appropriate changes have been made to improve the quality of the training.

## **Considerations for the future**

In this millenium, we are likely to experience many changes in the health status, health needs and health services delivery. Expectations of the public for health care will change. If the discipline of community medicine in the undergraduate medical curriculum is expected to enhance the ability of the 'basic doctor' to work in a given setting, it is necessary to impart the "ability to understand the complexities of the interaction between the health of the individual or of a population within which disease is determined or health persists".<sup>14</sup>

Halfden Mahler former Director General of the World Health Organization, summarizes several of the important challenges for medical education, as follows: "The development of health personnel able and willing to service the community by providing health care, promoting health, preventing disease and caring for those who need, is a formidable task for educators".<sup>15</sup> This statement is equally true of all health personnel, irrespective of the position they hold in a health care system. Undoubtedly, training in Community Medicine both at undergraduate and postgraduate level has a major role to play in meeting these challenges.

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