Community Health

K. N. Panicker & Vijai Dhanda

Community participation in the control of filariasis

A programme was launched in 1986 for the control of brugian filariasis in an area of high endemcity in southern India. Sustained community involvement was achieved by integrating economic measures to improve the lot of the people with the creation of widespread awareness about the cause of the disease and about the possibilities of combating it.

In India, filariasis is caused by two species of nematode parasite: the more common, *Wuchereria bancrofti*, causes bancroftian filariasis, while *Brugia malayi*, restricted to parts of Kerala and isolated pockets in Orissa, causes brugian filariasis. The fatalistic acceptance by the people of their condition, and the lack of a general health awareness, undoubtedly contributed to the failure of control measures before the initiative described here was undertaken. In 1986 the Vector Control Research Centre identified community participation as the key to successful control and introduced a strategy offering incentives to the people of the Shertallai region (area, c. 304 km²; population, 0.4 million) of Kerala to take part directly in the control of brugian filariasis.

Shertallai lies between the Vembanad Lake and the Arabian Sea. It has a high groundwater table and there are innumerable ponds, canals and channels. With the advent of road transport the canals fell into disuse and in the course of time they have become heavily infested with aquatic plants such as *Pistia stratiotes*, *Eichhornia crassipes* and *Salvinia molesta*, providing an excellent breeding habitat for the mosquito vectors of filariasis.

Traditionally, the people used these plants as manure for their coconut trees. Many people even grew the weeds in the ponds from which they took all their water for household use, believing that in this way it was kept cool for bathing and drinking during the summer. Other household ponds, used for retting coconut husks, are also highly favourable for the breeding of mosquitos.

Dr Panicker is Project Chief and Dr Dhanda is Director, Vector Control Research Centre, Medical Complex, Indira Nagar, Pondicherry 605006, India.
Community effort

It was necessary to involve the community in the control programme because the removal of weeds could not be done without the active cooperation of the people, on whose land many of the bodies of water were located. Furthermore, without community participation the programme would not have been sustainable.

The high literacy rate in Kerala allowed the dissemination of information about the disease and its control. Messages in the forms of slogans and cartoons were displayed on walls, hoardings, cinema screens and elsewhere, dealing with simple methods of environmental management for the control of the vectors.

House-to-house visits were made in order to educate people about the disease and the causes of its spread. An intensive health education campaign was launched in schools and colleges with the assistance of the authorities. Scientific aspects of the problem and its solution were incorporated into curricula.

Health education messages were conveyed to children on name slips, timetable cards, measuring scales and so on. During the 1987 Christmas holiday, college students cleared the weeds from 48,000 square metres of largely disused canals.

Various public organizations, among them the Urban Basic Services, the Integrated Child Development Services, and the Rural
Functional Literacy Programme, with their own health education programmes, were used to disseminate basic knowledge about vector control.

However, awareness on its own cannot solve any problem. The people have to be motivated to act, and what better way of achieving this could there be in an area of low economic status than to offer cash or other direct incentives? This encourages the first steps to be taken; subsequently, no such inducements should be needed, as the people will see the advantages of maintaining their efforts.

The people were persuaded to destroy the weeds in their ponds and to rear fish instead. Fingerlings of fast-growing edible species, including Catla catla, Cyprinus carpio, Labeo robita, Labeo fimbriatus and Cirrhinus mrigala, were allocated free to people who expressed an interest. The fish generated extra income and the programme rapidly became popular. Fingerlings of weed-eating edible fish, such as Ctenopharyngodon idella (Chinese grass carp) and Osphronemus goramy (giant gourami), were also distributed.

Impressed by the success of the pisciculture programme, the National Bank for Agriculture and Rural Development has taken it over and has offered loans to farmers wishing to make economic use of weed-infested ponds in which mosquitos were breeding. An amount equivalent to about US$ 380 000 was set aside for the implementation of this programme over the period 1989–91. Inland fisheries have appeared in the area. Better health with economic prosperity can clearly be a cornerstone of development.

Many of the local people remained doubtful about the destruction of weeds. To replace this source of manure, a nitrogen-fixing plant, Crotalaria juncea (sunhemp), was introduced and grown under coconut trees. Kerala’s Department of Agriculture has adopted this green manure programme extensively in the Shertallai region.

A filariasis clinic was established to serve people who already had the disease in chronic form. There is no cure but some relief can be offered. Health care was also provided at regular health camps in remote areas where screening was conducted for filariasis and affected people were given drugs; minor ailments were also attended to, and this helped to win the confidence of the people.

The biggest challenge lay in creating a mass movement. The Filariasis Control Movement was born of the amalgamation of six voluntary organizations; a registered charity, it now encompasses more than 80 organizations with a membership of over 8000, equivalent to one in every household in the Shertallai region. The members devote their spare time almost exclusively to active measures aimed at eradicating filariasis.

The present thrust of the Movement is to convert the vertical programme of control into a horizontal one. Volunteers have taken

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the message of vector control to every corner of the Shertallai region. They are organizing voluntary workers to remove weeds from domestic ponds. The volunteers often spend their evenings in discussions,
Lymphatic filariasis

Lymphatic filariasis is the result of infection by parasitic nematode worms, both male and female, of the family Filaroididae. The males are 15–30 mm long, the females 30–60 mm. The female continuously sheds microfilariae about 0.2–0.3 mm long into the lymphatic system which pass subsequently into blood vessels. Three species are particularly frequent: *Wuchereria bancrofti* leads to the most severe form of lymphatic filariasis, affecting limbs, breasts and genitalia and it can induce tropical pulmonary eosinophilia; *Brugia malayi* and *Brugia timori* cause less severe problems and affect mainly the lower limbs. WHO estimates that there are 90 million cases of lymphatic filariasis in the world, in 76 countries; 905 million people live in areas where they are at risk of contracting the disease.

The larvae of *Brugia* and *Wuchereria* are transmitted to man through the bites of infected mosquitoes, which introduce the larvae into the human body. The adult worms live in the lymph vessels. The surrounding tissues become sensitive to the parasite or its metabolic products. The resulting lymphatic damage causes a build-up of lymph fluid, ultimately resulting in lymphedema and elephantiasis, a painful and disfiguring swelling of the limbs and genitalia which is a classic sign of late-stage disease.

Transmission of lymphatic filariasis can be reduced in endemic areas by avoiding mosquito bites through the use of insect repellents, bednets and insecticides. In towns, sanitation can also make an important contribution to reducing the risk for the disease, since the vector *Culex quinquefasciatus* often breeds in polluted urban waters such as blocked drains and sewers.

Chemotherapy for lymphatic filariasis consists of one well-established and widely used drug, diethylcarbamazine (DEC), and one more recently introduced and much used against onchocerciasis, ivermectin. Both drugs are suitable for mass administration. DEC is a very effective “microfilaricidal” (kills microfilariae), even in a single dose, though in most cases some microfilariae remain in the blood. In high enough doses DEC is also a partial “macrofilaricidal” (kills adult worms) but the rapid DEC-induced destruction of microfilariae in heavy infections is associated with sometimes severe side-effects. Research for a satisfactory macrofilaricidal drug is currently underway. Chronic filarial elephantiasis and hydrocele (fluid collected in the space around the testes) require surgical treatment.

seminars and study classes in order to educate and orientate the community towards a broadly based view of filariasis control. New ideas sometimes emerge during such activities; for instance it was suggested that cultural programmes should convey messages on filariasis control. Special emphasis was placed on using local folk art forms. Young men and women went into villages and performed street plays and dances with an educational content.

The more motivated members of the movement have been identified and given intensive training in the taking of blood smears and the administration of drugs. Over 200 of these volunteers now work in 75 filariasis detection and treatment centres in Shertallai. The Movement has initiated a mass drug administration programme; of 30 847 persons examined for microfilaraemia, 292 were positive and received chemotherapy.
Impact on transmission

Two measures of the size of the mosquito population, the man-biting rate and the resting density, have shown sizeable reductions after the intervention, relative to the numbers in an area where no action was taken. The proportion of mosquitos carrying filarial larvae, as measured by mosquito infection and infectivity rates, declined almost to zero in the operational area, suggesting an effective interruption in transmission, whereas outside of the area this index was very high. The project having been launched as recently as 1986, it is too early to demonstrate any decline in the prevalence of chronic filariasis, since the disease process is prolonged.

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Hookworm anaemia remains a major problem

Hookworm infection and the iron deficiency anaemia it causes are still major public health problems in several areas of the tropics and subtropics, and continue to affect many millions of people. Often, the severity and extent of the problems are not fully appreciated. Because they are most prevalent in rural areas, where health facilities are generally very limited and of poor quality, hookworm infection and anaemia may be under-diagnosed and under-reported; as a consequence, inadequate measures for treatment, control and prevention may be a major factor in their persistence in the community.

In these circumstances, hookworm anaemia may also remain unrecognized as an underlying cause of high maternal morbidity and mortality, apathy and poor health in children, and easy fatiguability and impaired working capacity in adults. Its effects are insidious. Once the relationship is suspected, however, confirmation presents little difficulty and the discovery of iron deficiency anaemia in one area should lead to a search for it in other areas and adequate measures of its control in all sections of the affected community.