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Elimination of lymphatic filariasis as a public health problem

Lymphatic filariasis: economic aspects of the disease and programmes for its elimination

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Introduction

Lymphatic filariasis affects 120 million people in over 80 countries: 44 million have visible signs of disease—hydrocoele and lymphoedema—and another 76 million have preclinical or internal disease (WHO, 1997). The 1998 World Health Report ranked lymphatic filariasis as the fourth leading cause of permanent disability (WHO, 1998). Furthermore, one-fifth of the world's population is at risk of infection (WHO, 1997). Lymphatic filariasis imposes an economic burden on infected individuals, their households, and the communities in which they live. Ultimately, lymphatic filariasis is a disease caused by poverty and a disease that perpetuates the poverty cycle. Updating a previous review (EVANS *et al.*, 1993), this report examines the economic evidence supporting that claim and suggests that investments in health interventions alone may not be enough to eliminate disease transmission.

Impact of filariasis on health care systems

The economic burden of lymphatic filariasis can be categorized as direct disease-related costs to individuals and households, costs to government-funded health care systems, lost productivity of infected individuals, and reduced productivity from structural changes in the economies of endemic villages. Data on individual's expenses for medical care related to lymphatic filariasis are limited but some exist. In India, where one-third of the cases of lymphatic filariasis can be found, over 10 million people each year seek treatment for the disease. The total annual treatment costs borne by individuals including medicines, doctor's fees and travel, companion costs and accommodation, exceed US $30 million (RAMAIAH *et al.*, 2000). This total does not include the costs borne by the government for medical care. Data from other regions on the costs to individuals and households are generally not available. However, evidence from Tanzania and Tahiti show that it is fairly common to seek treatment for acute attacks, although the nature and cost of treatment were not specified (MARCH *et al.*, 1960; GASARASI *et al.*, 2000). Direct expenditures by individuals and households may be low or nonexistent because either medical care is not affordable or no safe and effective treatment is available (WEGESA *et al.*, 1979; LU *et al.*, 1988).

Lymphatic filariasis also imposes a burden on the health care infrastructure in endemic areas. Again, data are limited. However, 2 reports provide insight. In 1975, a district hospital in Tanzania reported that 15% of major surgeries were for hydrocoele repair (WEGESA *et al.*, 1979). More recently, in 1998, Dr J. Gyapong estimated that in a hospital in northern Ghana as much as 25% of all surgery is for hydrocoele (Ghana Ministry of Health, personal communication).

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Impact of filariasis on economic productivity

Lymphatic filariasis reduces the economic productivity of individuals. Economic losses result from the disability associated with acute attacks and chronic manifestations of the disease. An acute attack can result in several lost workdays and sufferers often experience multiple attacks each year. Persons with the 2 most common chronic disease manifestations—hydrocoele and lymphoedema—generally experience lifelong decreases in productivity. Because of its prevalence, hydrocoele appears to have the greater impact. During the 1970s, it was reported that 90% of men along the Tanzanian coast and 60% in the Coast Province of Kenya were affected by the age of 70 years (WIJERS, 1977; WEGESA *et al.*, 1979). In India, 45% of men in Pondicherry have hydrocoele by the age of 60 years (PANI *et al.*, 1991). In India, it is estimated that lymphatic filariasis causes almost US $1 billion a year in lost productivity (RAMAIAH *et al.*, 2000); in some communities, 7–8% of male labour is lost (RAMU *et al.*, 1996). In Africa, lymphatic filariasis may cause almost US $1 billion in losses each year (HADDIX *et al.*, 1999); 83% of this loss is due to disability in men with hydrocoele. Lymphatic filariasis has changed the economic activities of entire communities. In Tanzania, some villages have switched from fishing to farming to adapt to decreased male labour productivity (MUHONDWA, 1983).

Since the middle of the past century, there have been documented reports on impact of filariasis on major industries, including the productivity of rubber tappers in Malaysia (KESSEL, 1957), agricultural workers in then British Guiana (GIGLIOLI & BEADNELL, 1960), and, more recently, on farmers in Ghana (GYAPONG *et al.*, 1996) and weavers in India (RAMU *et al.*, 1996). Industry has long recognized the debilitating effects of lymphatic filariasis and, in some localities, has attempted to mitigate the problem. Improvements in housing, water and sanitation facilities on sugar plantations in then British Guiana were followed by a decrease in the prevalence of infection (GIGLIOLI & BEADNELL, 1960). Currently, efforts to eliminate lymphatic filariasis in several western Pacific nations are being led by the mining industry.

Socioeconomic factors and disease prevalence of filariasis

The prevalence of lymphatic filariasis and the associated debilitating manifestations and costs are affected by local socioeconomic conditions, most frequently by activities that provide mosquito breeding sites. For example, coco-fibre processing in Sri Lanka is associated with filariasis endemicity because the ponds used for the processing also support breeding sites (SCHWEINFURTH, 1983; MAK, 1986). In Haiti, disposal of byproducts of village rum production results in pools of standing sugary water throughout the community (D. Addiss, US Centers for Disease Control and Prevention, personal communication). Sometimes, attempts to improve the local economic situation have resulted in the spread of the disease. In Ghana, the spread of lymphatic filariasis may be associated with the development of a large irrigation project (J. Gyapong, personal communication). On a more positive note, there are documented cases of

development schemes that have reduced filariasis transmission. SCHWEINFURTH (1983) observed that the conversion of marshy areas to rice farming in Sri Lanka resulted in a decrease in transmission. Development pressures in a township in rural India reduced the number of water ponds and, thus, breeding sites for mosquitoes (RUSSEL *et al.*, 1979). Spread in the geographical range and an increase in the prevalence of the disease are consequences of changes in the demographic characteristics of at-risk countries. Crowded living conditions, housing quality, and inadequate waste disposal and sanitation facilities combined with seasonal migration between endemic rural areas and non-endemic urban areas contribute to the growing urbanization of this disease (SCHWEINFURTH, 1983; MAK, 1986).

Conclusion

The evidence reviewed here indicates that lymphatic filariasis is closely associated with the economies and infrastructure of endemic communities. Recent, growing support for mass chemotherapy programmes provides hope that the physical, social, and economic burden of lymphatic filariasis can be reduced, if not eliminated. Further, health programmes coupled with development projects which address the key components that contribute to lymphatic filariasis may improve the chances of success. Specifically, projects that would reduce mosquito breeding sites, improve housing and sanitation facilities, and stimulate economic development should be considered. Because of the industry-wide impact of lymphatic filariasis in some regions, there is great potential for a strong private sector role in the elimination of this disease as a public health problem.

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