WHO/CDS/CPE/PVC/2002.3
English only
Distr.: General

DEFINING THE ROLES OF VECTOR CONTROL AND XENOMONITORING IN THE GLOBAL PROGRAMME TO ELIMINATE LYMPHATIC FILARIASIS

Report of the Informal Consultation

WHO/HQ, Geneva, 29-31 January 2002

World Health Organization
Communicable Disease Control, Prevention and Eradication
Parasitic Diseases and Vector Control

Cover picture drawn by Norman Lacey, supplied courtesy of Syngenta.

DEFINING THE ROLES OF VECTOR CONTROL AND XENOMONITORING IN THE GLOBAL PROGRAMME TO ELIMINATE LYMPHATIC FILARIASIS

Report of the Informal Consultation
WHO/HQ, Geneva, 29-31 January 2002

Executive summary

The consultation was convened to assess the potential value of vector control to augment the Global Programme to Eliminate Lymphatic Filariasis (GPELF), a mosquito-borne disease affecting about 120 million people in 80 countries. The meeting also provided an opportunity to consider the possible role of monitoring filariasis prevalence in the human population via vector sampling and assays. The term xenomonitoring was introduced for this approach.

The GPELF was launched in 2000, based on two strategies: stopping transmission and alleviation of disability due to the disease. Currently the GPELF depends largely on mass drug administration (MDA) to interrupt transmission of filaria parasites: *Brugia* and *Wuchereria bancrofti*. Integrated vector control activities and environmental sanitation are encouraged while national ELF programmes focus primarily on achieving high rates of MDA coverage.

More than half of the world's burden of lymphatic filariasis (LF) is transmitted by *Culex quinquefasciatus* and other man-biting mosquitoes of the *Culex pipiens* complex, responsible for Bancroftian filariasis transmission in the Americas, Egypt, urban East Africa, the Indian subcontinent, Indonesia and southeast Asia. In about 40 countries (African region and Papuan sub-region), *W. bancrofti* is largely transmitted by *Anopheles* mosquitoes that also vector malaria in rural areas. In most Pacific countries, *W. bancrofti* is vectored by aedine mosquitoes (*Aedes* and *Ochlerotatus*) that also transmit arboviruses, notably dengue. Brugian filariasis, transmitted by *Mansonia* and *Anopheles*, is now limited to only 8 oriental countries.

To provide the GPELF with the option of employing appropriate vector control tools, selectively targeted to prevent transmission, this consultation reviewed the state-of-the-art and current knowledge on proven techniques for controlling mosquitoes responsible for vectoring each type of lymphatic filariasis. Given the rapidity of upscaling MDA coverage in each endemic country, it is essential for GPELF resources to be concentrated on MDA, not dissipated on vector control practices unless there is strong evidence of their cost-benefits. The working papers and presentations indicated that many LF vector scenarios can be tackled effectively, but the cost-effectiveness is seldom clear and needs further analysis in most cases. Even so, there are widespread opportunities for LF vector control to have multi-purpose impact, especially with *Anopheles* control for Roll Back Malaria, with *Aedes* control for dengue fever and dengue haemorrhagic fever prevention and *Culex* control for urban nuisance suppression.

Environmentally acceptable interventions can be effectively employed against mosquito vectors of LF in most, but not all, eco-epidemiological settings. Wherever appropriate (see below), vector management activities can be applied against both mosquito larvae and adults to reduce their density and vector potential. Efforts should be made to optimise the multi-disease impact of vector control operations already underway in other public health programmes. Despite continuing efforts in the affected countries, however, integrated vector management (IVM) is seldom well resourced where LF has to be eliminated.

Wherever malaria and LF are co-endemic and transmitted by the same species of *Anopheles*, anti-malaria vector control practices (i.e. indoor spraying of residual insecticide [IRS] and the use of ITNs — insecticide-treated nets and curtains) tend to have even greater impact on LF transmission, to the point that LF has been eliminated as a by-product of malaria vector control in some situations. This synergy of *Anopheles* control should be further evaluated and optimised. In particular, as *W. bancrofti* is co-endemic with malaria across tropical Africa, participants recommended that African ELF programmes in conjunction with the Roll Back Malaria partnership (RBM) should scale-up ITN coverage in LF endemic districts. Given the RBM 2005 target of 60% coverage with ITNs, there is ample opportunity for developing this synergy in most malarious countries, mediated by respective programme managers in cooperation with endemic district health teams.

Where *W. bancrofti* is transmitted by *Culex* and at least 2/3 of this vector production is from flooded pits (particularly pit latrines and soakage pits), application of expanded polystyrene beads (EPBs) to the pits is recommended for prolonged suppression of vector potential. This approach would be inadequate in situations (areas with monsoon climate) where the majority of vector *Culex* breeding-sites are in flooded ditches, surface pools and water storage containers. Habitual use of ITNs is essential wherever LF remains endemic (being popular against nuisance mosquitoes as well giving substantial protection against malaria and other mosquito-borne diseases), particularly where *Culex* and other mosquitoes are left uncontrolled. Improved sanitation and drainage systems, where affordable, greatly reduce transmission risks of LF as well as other helminth and enteric diseases.

Larviciding is usually not effective or sustainable for filariasis vector control (except in special situations), so this method is generally discouraged as uneconomic and inappropriate for the GPELF. Participants were unable to identify reliable methods for cost-effective control of *Aedes* or *Mansonia* vectors of LF, other than general source reduction and environmental management in conducive situations.

Brugia timori is restricted to islands of Nusa Tenggara (Flores and Timor group) and has only one known vector, *Anopheles barbirostris,* and this is amenable to standard malaria vector control measures (IRS & ITNs). Given the political will and resources, MDA could be augmented by vector control to stop transmission and eliminate *B. timori* (following the example of *W. bancrofti* elimination from Solomons).