



# WORLD HEALTH ORGANIZATION

EXECUTIVE BOARD  
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## Dengue prevention and control

### Report by the Secretariat

1. Dengue is the most common and widespread arthropod-borne viral infection in the world. There are four distinct virus serotypes, each capable of producing a wide spectrum of signs and symptoms that characterize dengue fever, ranging from subclinical infection, to a debilitating but self-limiting illness with symptoms resembling influenza, to severe disease known as dengue haemorrhagic fever. Without proper hospital care, the latter can lead to clinical shock and death in less than 24 hours.
2. The geographical spread, incidence and severity of dengue fever and dengue haemorrhagic fever are increasing in the Americas, South-East Asia, the Eastern Mediterranean and the Western Pacific. Before 1970, only nine countries had experienced dengue haemorrhagic fever. Since then, the number has increased more than fourfold and continues to rise. Some 2500 million to 3000 million people live in areas where dengue viruses can be transmitted. A pandemic in 1998, in which 1.2 million cases of dengue fever and dengue haemorrhagic fever were reported from 56 countries, was unprecedented. Preliminary data for 2001 indicate a situation of comparable magnitude. However, only a small proportion of cases are reported to WHO; it is estimated that each year 50 million infections occur, with 500 000 cases of dengue haemorrhagic fever and at least 12 000 deaths, mainly among children, although fatalities could be twice as high.
3. Without proper clinical management, case-fatality rates for dengue haemorrhagic fever can exceed 20%. However, with intensive supportive therapy, rates can be reduced to less than 1%.
4. The resurgence of epidemic dengue fever and the emergence of dengue haemorrhagic fever as major public health problems are rooted in the demographic trends and socioeconomic policies of the twentieth century. During the past five decades, the population of the world has more than doubled, with the most rapid acceleration taking place in developing countries in the tropics and subtropics where dengue viruses are spread by mosquitos. Several factors have combined to produce epidemiological conditions that highly favour viral transmission by the main mosquito vector, *Aedes aegypti*: population growth, rural-urban migration, the inadequacy of basic urban infrastructure (e.g. unreliable water supply, which may lead householders to collect and store water close to homes) and the huge increase in volume of solid waste resulting from the new habits of consumers, for example, discarded plastic containers and other abandoned items which provide larval habitats in urban areas. The species thrives in intimate association with humans and is also the vector of the virus of urban yellow fever, a vaccine-preventable disease. A secondary vector of dengue virus, *Ae. albopictus*, which until the late 1970s was geographically limited to parts of Asia, has now become established in Africa, the Americas and Europe. Geographical expansion of this mosquito has been aided particularly by international commercial trade in used tyres which, with accumulated rainwater, are attractive habitats for egg-laying females of the species. Its role in the transmission of dengue and

potentially also of yellow fever and other arthropod-borne viruses in these new epidemiological settings remains to be determined. The magnitude of the public health problem will continue to grow unless more effective measures are taken to reduce viral transmission.

5. In many countries, health-sector reform poses new challenges for programme delivery, including decentralization and issues of selection, purchase, procurement, use and monitoring of insecticide application. Moreover, few new cost-effective chemical pesticides suitable for public health use have been developed in recent years. This problem is particularly acute with regard to larvicides suitable for use in stored water for domestic consumption.

6. Although research on dengue vaccines for public health use is in process, currently the only method for the prevention and control of the disease is vector control. The global strategy enunciated in 1995<sup>1</sup> recommended the application of integrated vector-control measures, with community and intersectoral participation. An informal WHO consultation on strengthening implementation of the global strategy for prevention and control of dengue fever/dengue haemorrhagic fever (Geneva, 18-20 October 1999), the subsequent inclusion of dengue in the disease portfolio of the UNDP/World Bank/WHO Special Programme for Research and Training in Tropical Diseases in June 2000, and advances in regional strategy formulation in the Americas, South-East Asia and the Western Pacific during the 1990s have facilitated identification of the following four main priorities:

(i) strengthening epidemiological surveillance for planning and response, including entomological surveillance and the monitoring of key human behaviours (such as inappropriate disposal of discarded household items) that contribute to the availability of mosquito larval habitats. Epidemiological surveillance includes the introduction of DengueNet, a global surveillance system for dengue fever on the Internet. This network includes a database which will be continually updated and which will allow remote data entry in order to provide a more comprehensive and current global picture;

(ii) reducing the disease burden through: accelerated training and the adoption of WHO standard clinical management guidelines for dengue haemorrhagic fever; improving emergency preparedness and response; and strengthening of national vector-control programmes;

(iii) promoting behavioural change through the development and implementation of a package of tools, approaches and guidelines for sustainable prevention and control of vectors at individual, household, community, institutional and political levels. The approaches will also foster intra- and intersectoral partnerships for programme implementation;

(iv) accelerating the research programme, with emphasis on mechanisms of pathogenesis, transmission dynamics, vaccine development, validation and improvement of existing or new vector-control methods and their application, partnership building, and formulation of guidelines for research in these strategic areas.

7. Given the worsening epidemiological trends, there is evident need to renew or intensify efforts to reduce the public health and economic burdens associated with this epidemic disease. In order to achieve this, the following will be required: the development, application and evaluation of new and improved tools and strategies for the prevention and control of dengue fever and dengue haemorrhagic fever; increased commitment and additional human and other resources for improved and sustainable

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<sup>1</sup> Report of the consultation on key issues in dengue vector control toward the operationalization of a global strategy, WHO, Geneva, 6-10 June 1995, document CTD/FIL(DEN)/IC/96.1.

prevention and control efforts; building and strengthening the capacity of health systems for dengue surveillance, laboratory diagnosis and disease management, and active intersectoral partnerships involving international, regional, national and local agencies and nongovernmental organizations.

## **ACTION BY THE EXECUTIVE BOARD**

8. The Board is invited to consider adoption of the following draft resolution:

The Executive Board,

Having considered the report on dengue prevention and control,

RECOMMENDS to the Fifty-fifth World Health Assembly the adoption of the following resolution:

The Fifty-fifth World Health Assembly,

Recalling resolution WHA46.31 and resolutions CD31.R26, CD33.R19 and CD43.R4 of the Directing Council of the Pan American Health Organization on dengue prevention and control;

Concerned that an estimated 50 million dengue infections occur annually and that the geographical spread, incidence, and severity of dengue fever and dengue haemorrhagic fever is increasing in the tropics;

Recognizing the growing burden of disease, particularly among children, and the social and economic impact of dengue epidemics;

Acknowledging the progress made in reducing the case-fatality rates of dengue haemorrhagic fever in some countries;

Appreciating that significant advances have been made in the development of dengue vaccines, although they are not yet available for public health use;

Recognizing that prevention or reduction of dengue viral transmission entirely depends on control of the mosquito vector *Aedes aegypti* and, to a lesser extent, *Ae. albopictus* and other secondary vector species;

Aware that dengue vector-control programmes have had considerable success in the past, but that sustained suppression of vector populations today largely depends on the collective actions and behaviours of all members of affected communities to prevent breeding of *Ae. aegypti*;

Further acknowledging that, at the International Conference on Dengue and Dengue Haemorrhagic Fever (Chiang Mai, Thailand, 20-24 November 2000), more than 700 public health specialists from 41 countries recommended that all countries at risk of dengue viral transmission should develop and implement sustainable prevention and control programmes,

1. URGES Member States:

- (1) to advocate increased commitment and acquisition of additional human and other resources for improved and sustained prevention and control efforts;
- (2) to build and strengthen the capacity of health systems, including diagnostic laboratories, for management, surveillance, prevention and control of dengue fever and dengue haemorrhagic fever;
- (3) to promote active intersectoral partnerships involving international, regional, national and local agencies, nongovernmental organizations, foundations, the private sector, community and civic organizations;
- (4) to pursue, encourage and support the development, application and evaluation of new and improved tools and strategies for prevention and control of dengue fever and dengue haemorrhagic fever;

2. URGES other specialized agencies, bodies and programmes of the United Nations system, bilateral development agencies, nongovernmental organizations and other concerned groups to increase their cooperation in dengue fever prevention and control, through both continued support for general health and social development and specific support to national and international prevention and control programmes, including emergency control;

3. REQUESTS the Director-General:

- (1) to develop further and support implementation of the global strategy for prevention and control of dengue fever and dengue haemorrhagic fever;
- (2) to continue to seek resources for advocacy and research on improved and new tools and methods for dengue fever prevention and control and their application.

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