







2012–2020

GLOBAL STRATEGY FOR DENGUE PREVENTION AND CONTROL

World Health Organization

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WHO Library Cataloguing-in-Publication Data

Global strategy for dengue prevention and control 2012-2020.

1.Dengue – prevention and control. 2.Dengue – epidemiology. 3.Endemic diseases – prevention and control. 4.Disease outbreaks – prevention and control. 5.Mosquito control. 6.Health planning. I.World Health Organization.

ISBN 978 92 4 150403 4 (NLM classification: WC 528)

Printed in France

Design & layout: Patrick Tissot WHO/HTM/NTD

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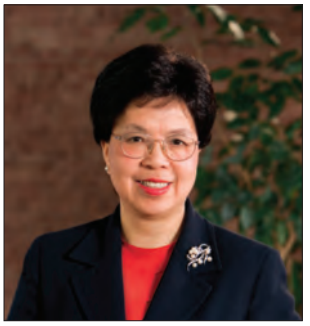
FOREWORD

In just the past decade, the significance of dengue as a threat to health and a burden on health services and economies has increased substantially. Compared with the situation 50 years ago, the worldwide incidence of dengue has risen 30-fold. More countries are reporting their first outbreaks. More outbreaks are explosive in ways that severely disrupt societies and drain economies. Today, dengue ranks as the most important mosquito-borne viral disease in the world. Everywhere, the human and economic costs are staggering.

In a sense, this neglected tropical disease has taken the world by surprise, with few coherent and coordinated efforts, at national or international levels, undertaken to hold dengue at bay and reverse these alarming trends. The Global strategy for dengue prevention and control, 2012–2020, aims to correct this situation. It answers requests, by multiple WHO Member States, for advice on how to move from a reactive response to an emergency situation to proactive risk assessment, early warning systems, and preventive measures, guided by entomological as well as epidemiological surveillance.

Above all, the Global strategy emphasizes the many new opportunities, opened by country experiences and recent research, also on vaccines, that can be seized to reduce morbidity and mortality, rationalize the disease response, and build capacities that increase resilience to future outbreaks. To this end, the document also serves as an investment case, spelling out the steps that can be taken to improve risk assessment and mapping, stockpiling and logistics, surveillance and diagnostic capacity, behavioural and social interventions, and risk communication.

A complex disease like dengue demands a multi-pronged response that engages government ministries well beyond the health sector. The Global strategy promotes coordinated action among multisectoral partners, an integrated approach to vector management, and sustained control measures at all levels. Its guiding principle is to harmonize prevention, entomological and epidemiological surveillance, and case management with existing health systems, ensuring that efforts are coherent, sustainable, cost-effective and ecologically sound.



This is a global strategy for a global threat. As we have learned, dengue and its vectors travel well internationally. I challenge all partners to study the strategy, define their role, and engage with a fully justified sense of urgency. As the strategy demonstrates, doing so will be highly rewarding. The overall message is upbeat and encouraging. Despite the complex clinical manifestations of this disease, its management is relatively simple, inexpensive and highly effective in saving lives, provided correct and timely interventions are instituted. When these interventions are in place, mortality from dengue can be reduced to zero. Let us make this our overarching – and broadly shared – goal.

Dr Margaret Chan
Director-General
World Health Organization

EXECUTIVE SUMMARY

Dengue is a major public-health concern throughout tropical and sub-tropical regions of the world. It is the most rapidly spreading mosquito-borne viral disease, with a 30-fold increase in global incidence over the past 50 years. The World Health Organization (WHO) estimates that 50–100 million dengue infections occur each year and that almost half the world's population lives in countries where dengue is endemic. While dengue is a global concern, with a steady increase in the number of countries reporting the disease, currently close to 75% of the global population exposed to dengue are in the Asia-Pacific region.

Epidemics of dengue result in human suffering, strained health services and massive economic losses. In some countries, the burden of dengue is comparable to that of tuberculosis and other communicable diseases with high disease burdens; unexpected surges in cases and the challenge to health systems of triaging thousands of cases without knowing which severe cases will require hospital care are additional challenges. There has not, however, been concerted action against dengue, and the 1995 WHO strategy[1] warrants revision in the light of new advances. This *Global strategy for dengue prevention and control, 2012–2020* aims to address this need.

The goal of the global strategy is to reduce the burden of dengue. The specific objectives are to reduce mortality and morbidity from dengue by 2020 by at least 50% and 25% respectively (using 2010 as the baseline). These objectives can be achieved by applying existing knowledge.

Dengue mortality can be reduced by implementing early case detection and appropriate management of severe cases; reorienting health services to identify early cases and manage dengue outbreaks effectively; and training health personnel, along with appropriate referral systems, at primary health-care levels.

Dengue morbidity can be reduced by implementing improved outbreak prediction and detection through coordinated epidemiological and entomological surveillance; promoting the principles of integrated vector management and deploying locally-adapted vector control measures including effective urban and household water management. Effective communication can achieve behavioural outcomes that augment prevention programmes.

Research will continue to play an important role in reversing the trend in dengue, a neglected tropical disease, by improving methods and systems for surveillance, prevention and control.

Reversing the trend requires commitments and obligations from partners, organizations and countries, as well as leadership by WHO and increased funding. Fund-raising is probably best addressed by a combined effort, with consideration for dengue as a public health problem in countries with substantial local and national funding resources that must be effectively channelled through sound technical support. Dengue prevention and management can now exploit opportunities presented by promising advances in vector control technology interventions, diagnostics, prognostic systems for triage, evidence-based clinical interventions and candidate vaccine developments. In order to realize these opportunities, we need to ensure they are implemented, coordinated and adequately resourced.

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[1] WHO (1996). *Report of the consultation on key issues in dengue vector control towards the operationalization of a global strategy, WHO, Geneva, 6–10 June 1995*. Geneva, World Health Organization (CTD/FIL(DEN)/IC/96.1).

1. DENGUE: A GLOBAL THREAT – GLOBAL ANSWERS

1.1 BURDEN OF THE DISEASE

In 2012, dengue ranks as the most important mosquito-borne viral disease in the world. Outbreaks exert a huge burden on populations, health systems and economies in most tropical countries of the world. The emergence and spread of all four dengue viruses ("serotypes") from Asia to the Americas, Africa and the Eastern Mediterranean regions represent a global pandemic threat. Although the full global burden of the disease is still uncertain, the patterns are alarming for both human health and the economy.

During the past five decades, the incidence of dengue has increased 30-fold (*Figure 1*). Some 50–100 million new infections are estimated to occur annually in more than 100 endemic countries (WHO, 2012a; *Figure 2*), with a documented further spread to previously unaffected areas (CDC, 2010; La Ruche G et al, 2010); every year hundreds of thousands of severe cases arise, including 20 000 deaths (Gubler DJ, Meltzer MI, 1999); 264 disability-adjusted life years per million population per year are lost (Cattand P et al, 2006), at an estimated cost for ambulatory and hospitalized cases of US$ 514–1394 (Suaya J et al, 2009), often affecting very poor populations. The

Compared with other diseases and their respective burdens, dengue can cause as much or greater human suffering than other communicable diseases in some of the most affected regions. In Latin America and the Caribbean, for example, by the 1990s dengue was causing a similar burden of disease as meningitis, hepatitis, malaria, the childhood cluster of diseases (polio, measles, pertussis, diphtheria and tetanus) or tuberculosis (Meltzer et al., 1998). For South-East Asia, the burden of the disease was comparable with that of meningitis, having twice the burden of hepatitis and one third of the burden of HIV/AIDS (Shepard DS et al, 2004). For Africa, there are insufficient data from endemic countries to make even rough estimates of burden. In a recent publication 22 countries in Africa have reported sporadic cases or outbreaks of dengue from 1960-2010 (Amarasinghe A et al, 2011).

For individual countries, the importance of dengue as disease and public health problem cannot be overestimated, as seen in the recent explosive outbreaks of dengue in Brazil and Pakistan. In 2008, in Rio de Janeiro State alone, an outbreak caused more than 158 000 reported cases, over 9000 hospital admissions and 230 deaths between January and April (Barreto, 2008). This situation led to the military being deployed