

Summary of Dengue Situation in WHO Western Pacific Region

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Abstract

In the WHO Western Pacific Region, dengue/dengue haemorrhagic fever (DF/DHF) is a serious public health problem in many tropical countries. Every year, approximately 15 countries/areas report cases of the disease. The most regular reporting countries are: Cambodia, Lao People's Democratic Republic, Malaysia, the Philippines, Singapore, Viet Nam and several Pacific Island countries and areas.

In recent years, the dengue incidence has been increasing steadily throughout the Region. In 1998, a total of 151 124 cases with 787 deaths were reported, which was the highest number of cases recorded since 1991. Although the case fatality rate (CFR) for the Region has declined to less than 1% due to a better understanding of the pathogenesis and improvement in case management, the CFR still exceeds 4% in some parts of the countries due to late admission to hospitals. This paper briefly reviews the recent epidemiological situation of dengue in the Western Pacific Region, including several outbreaks that were reported throughout 1998 in countries such as Cambodia, the Philippines and Viet Nam. The paper also describes WHO's role and activities in the prevention and control of dengue in the Region.

Keywords: Dengue fever, Dengue haemorrhagic fever, Dengue shock syndrome (DSS), Western Pacific, *Aedes aegypti*, and case fatality rate (CFR).

Introduction

In recent years, dengue has become a major international public health concern. Many countries and areas in Asia as well as in Latin America have been experiencing unusually high levels of dengue/ dengue haemorrhagic fever activity.

countries and areas in the Region have reported cases of DF/DHF. The disease has been reported almost annually by 15 countries, including Cambodia, China, Lao People's Democratic Republic (Lao PDR), Malaysia, the Philippines, Singapore, Viet Nam and several Pacific Island countries and area. Table 1.

In the Western Pacific Region, DF/DHF continues to be a serious public health concern⁽¹⁾. Over the past two decades, 33 out of the 36

Table 1. Number of Reported DF/DHF Cases and Deaths in the Western Pacific Region, 1991-97

Year	1991		1992		1993		1994		1995		1996		1997	
Country/Area	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths
American Samoa	...	...	0	...	...	...	246	0	62	...	49	...	...	...
Australia	46	...	366	...	690	...	17	...	34	0	43	...	205	...
Brunei Darussalam	...	...	...	...	...	...	...	...	3	...	...	...	...	...
Cambodia	1882	136	4809	172	3913	169	1498	82	10428	424	1433	73	4224	177
China	902	3	2	0	359	0	17	0	6114	0	8	...	637	0
Cook Islands	1776	...	5	...	...	...	1	0	786	...	2	...	1075	0
Fiji	65	...	358	...	39	...	...	...	27	...	...	...	...	...
French Polynesia	518	...	593	...	355	...	134	...	208	...	...	...	...	...
Guam	0	...	...	...	...	...	...	...	...	...	...	...	1	...
Hong Kong	...	...	...	...	...	...	3	...	6	...	5	...	10	...
Japan	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kiribati	...	...	0	...	...	...	...	...	...	...	...	...	...	...
Lao PDR	249	...	265	...	343	4	2585	15	7781	31	8197	24	...	...
Macao	...	...	...	...	...	...	...	...	...	...	1	...	...	...
Malaysia	6628	39	5473	24	5615	23	3133	13	6543	28	¹ 14255 13723/ 532	30 2/30	¹ 19544 18738/ 806	50 3/47
N Mariana Islands	0	...	0	...	0
Marshall Islands	56

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Micronesia	20
Mongolia
Nauru	0
New Caledonia	26	...	10	...	4	...	11	...	1820	154	...
New Zealand	1	11
Niue	2	...	...	...	0	0	0	...	0	0	0	0	...	...
Palau	...	...	...	...	...	...	0	...	857	...	...	...	...	...
Papua New Guinea	475	...	...	...	...	...	...	...	...	...	...	...	...	...
Philippines	11317	401	9108	441	21146	...	^a 5603	^a 77	^a 5166	^a 88	^a 13614	^a 197	^a 12811	^a 314
Republic of Korea	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Samoa	22	...	3	...	2	...	0	...	278	...	1013	...	163	...
Singapore	2179	...	2878	...	946	0	1239	1	2008	1	^b 3128 (3104/ 24)	3	^b 4300 (4212/ 88)	1
Solomon Islands	...	...	...	...	...	...	0	0	1	...	3	...	...	...
Tokelau	3	...	0	...	0	...	0	...	...	...	...	...	...	...
Tonga	122	...	35	...	9	...	1	...	0	...	3	...	...	...
Tuvalu	19	...	811	...	...	...	0	...	...	...	...	...	...	...
Vanuatu	74	3	113	...	52	...	138	...	...	...	...	...	...	...
Viet Nam	94630	347	48333	206	53674	160	44944	115	80447	222	89963	205	108000	245
Wallis and Futuna	11	...	0	...	0	0	0	...	5	...	...	...	...	...
Total	121002	929	73163	843	87147	356	59570	303	122594	794	131728	532	153121	787

^aSentinel sites data

^bDF/DHF

... = no data available

During 1993–1997, a total of 552 088 cases were reported from the Region. Of these, 70% were reported from Viet Nam alone. Over the last two decades, the case fatality rate (CFR) has been declining in most of the endemic countries in the Region due

to a better understanding of the pathogenesis and improvement in case management. The overall CFR in the Region is now less than 1% (Figure 1). However, in some countries, the CFR still exceeds 4% due to factors such as late admission to hospitals.

In newly-industrialized countries such as Malaysia and Singapore where the dengue incidence had declined due to successful vector control programmes, a resurgence in cases has been reported since 1994. In the Pacific Island countries and areas, the reappearance of DEN-2 was confirmed in 1996 for the first time since the 1980s.

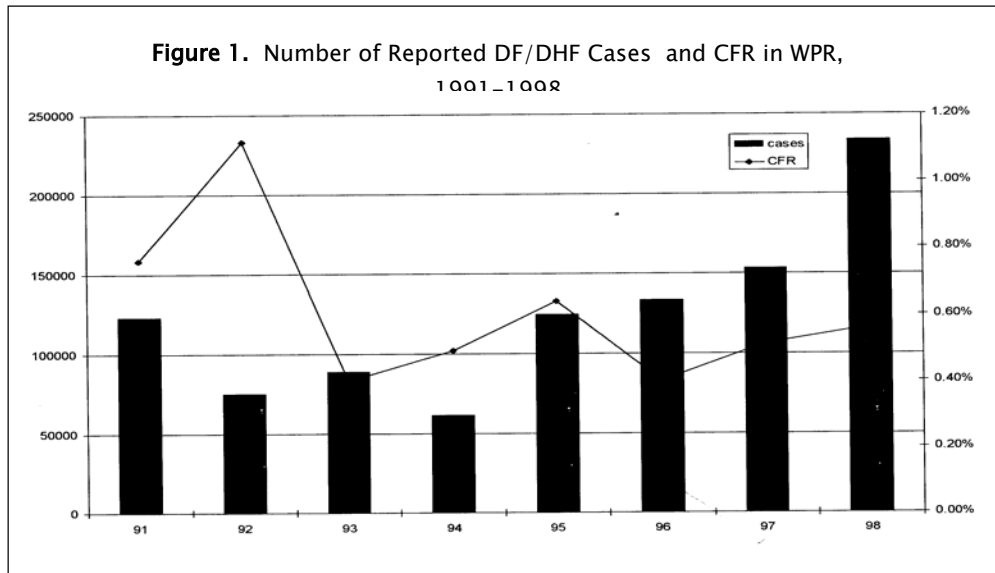
The occurrence of DF/DHF dengue cases in most countries in the Western Pacific Region reaches its peak during the period June–November each year. The level of activity in 1998 was considerably higher than in previous years. A major contributing factor to this increased

activity may be changes in weather patterns such as the El Nino phenomenon.

Current epidemiological situation of dengue in selected countries/areas

Australia

Dengue along with other mosquito-borne diseases such as Japanese encephalitis, Murray Valley encephalitis and Ross River fever, are causing significant human diseases in Australia. Over the past two decades, epidemic activity has been restricted



to north Queensland. In 1996–1997, an outbreak occurred in the Torres Strait during which approximately 210 laboratory-confirmed cases of DEN-2 were reported.

According to the National Centre for Disease Control in Australia, a total of 500 dengue cases were reported in the country in 1998 as of 8 December, which was more than double the number of cases reported during the same period in 1997 (207 cases). Commencing December 1997, an outbreak of DEN-3 was reported in Cairns, Queensland, and 165 confirmed cases were reported as of 25 May 1998. One case of DHF and the first case of dengue encephalopathy in the country were also reported. By June 1998, the outbreak had subsided due to control activities undertaken by the Tropical Public Health Unit of the Queensland Department of Health.

Cambodia

Dengue was first recognized in Cambodia in 1960 and, since then, the disease has become a serious public health problem with dengue epidemics occurring every two to three years in the country. In 1990

and 1995, major epidemics occurred, and 7241 cases (331 deaths) and 10 208 cases (424 deaths) respectively were reported. Like in all dengue-endemic countries, the major vector is *Aedes aegypti*, but *A.albopictus* also plays an important role in dengue transmission in rural areas.

In 1998, a large DHF outbreak occurred throughout the country⁽²⁾. From January to March, an unprecedented dry-season DHF outbreak occurred in Phnom Penh, with the number of cases exceeding the epidemic threshold more than five fold. In June, a sharp increase of DHF cases was observed, this time with the virus spreading to 18 of Cambodia's 22 provinces as compared to only six during the 1995 epidemic. Two provinces (Koh Kong and Kratie) reported DHF for the first time. By the end of 1998, a total of 16 216 DHF cases with 475 deaths were reported in the country (CFR=2.9%), which was the worst year for dengue on record. In response to the outbreak, the National Dengue Control Programme of the Ministry of Health, in collaboration with WHO and other agencies, established a nationwide action plan under which various prevention and control activities were

implemented. These included insecticide spraying and the distribution of the larvicide Abate to households across the country. In addition, health education was provided on television, radio and in the form of leaflets to encourage people to store water in regularly cleaned, covered containers. WHO and USAID provided spraying equipment and 38 tonnes of Abate in response to the outbreak.

Fiji

In 1989–90, a dengue outbreak with at least 3500 suspected cases including roughly 40 deaths, was reported. In December 1997, a large DEN-2 outbreak began in Fiji, and by the time the outbreak subsided in May 1998, a total of 24 780 suspected cases with 13 deaths had been reported. The areas affected were primarily the urban and peri-urban areas of Suva and Lautoka, the two largest cities. The Ministry of Health in Fiji quickly established an outbreak response team which met regularly to guide activities in the areas of surveillance, information dissemination, vector control and case management. A major community

campaign was also initiated in the country. WHO collaborated with the MOH from the outset in activities such as developing case management guidelines and sending insecticides and equipment from WHO's regional stockpile in Suva to be used for spraying campaigns for the epidemic. Support to the MOH was also provided by the Pacific Community through their AusAID-funded vector-borne disease control programme, the Government of Japan, and other international, regional and bilateral partners. The lower case fatality rate for the 1998 outbreak has been attributed to improved case management based on guidelines introduced early in the epidemic.

Malaysia

Since 1994, the incidence of dengue has been on the rise in Malaysia. According to the WHO Collaborating Centre for Arbovirus Reference and Research in Kuala Lumpur, the 1997 dengue season has been the most severe to date, with a total of 19 544 cases, including 806 DHF cases and 50 deaths reported. This was 37.1% higher than the total number of cases reported in 1996 (14 255 cases) and

the worst year for dengue on record. Cases were reported throughout the year but peaked in July. All the states in the country were affected, but high incidence was recognized in urban areas with a high population density. The virus strains were DEN-1 and DEN-2. Both played equally important roles in causing severe dengue infections.

In 1998, as of 16 May, a total of 5598 dengue cases with 5 deaths had been reported. This is similar to the number of cases reported during the same period last year (5600 cases) but the case fatality rate is 31% lower. Although most states have reported an increase in cases, the Federal Territory, followed by Selangor and Johor, have reported the highest number. The National Dengue Control Programme has been involved in disease surveillance, vector control, health education, community participation programmes, and research.

New Caledonia

In 1995-96, a dengue outbreak occurred in New Caledonia and 1820 cases were reported due to DEN-3. This was followed by a total of 154

dengue cases reported in 1997. However, in the first half of 1998, a DEN-2 outbreak occurred and by mid-July, a total of 2443 dengue cases had been reported - nearly 15 times more than the number of cases notified for the same period in 1997. Cases were concentrated primarily in and around Noumea. Vector control measures were undertaken by the Department of Health which included insecticide spraying and reduction of mosquito breeding sites. By the end of 1998, a total of 2616 cases (1730 confirmed) with no deaths were reported.

Philippines

According to the Department of Health's (DOH's) Health Intelligence Service, 11 571 DF/DHF cases were reported in the Philippines in 1997. The DOH's Field Epidemiology Training Programme (FETP) Surveillance System reported 12 811 cases with 314 deaths for 1997. In July and August 1998, outbreaks were reported in five areas in the Philippines but by September, a nationwide dengue outbreak was declared by the Department of Health (DOH) with 18 areas being declared as 'dengue hotspots'. By 15 December 1998, a total of 31 297 cases with 493

deaths (CFR=1.6%) had been reported in the country by the FETP. According to the FETP, this has been the most severe outbreak during the last decade. Most of the cases were from Metro Manila, the Ilocos Region, Benguet and Nueva Ecija, Western Visayas, Eastern Visayas and Southern Tagalog. San Lazaro Hospital, an infectious diseases hospital in the National Capital Region, reported 5992 cases with 103 deaths (CFR=1.7%) as of 19 December 1998. A dengue alert was issued by the DOH urging the public to eliminate mosquito breeding sites. Health education campaigns were strengthened and dengue operation centres were established to function as screening and rehydration stations. WHO provided support to the DOH in the areas of health education and the development of appropriate case management protocols.

Singapore

Since 1994, dengue incidence has been rising steadily in Singapore. In 1998, a total of 5258 cases was reported. This was the highest number of cases reported over the last decade. The Ministry of Environment is responsible for DF/DHF control in the

country and the control of *Ae. aegypti* and *A.albopictus* is largely through source reduction, health education and the application of public regulations.

Tonga

In February 1998, a dengue outbreak occurred in Tonga and, by 31 July, a total of 460 clinically suspected cases were reported. A total of 335 patients had undergone serology tests and 103 of these had confirmed evidence of DEN-2. There was one death of a child of six years attributed to DHF on 23 March 1998. No other deaths were reported. Between 1-15 June 1998, antibody tests were performed on 13 suspected cases with specimens collected. Of these cases, there were only two positive IgM results. Almost without exception, the confirmed cases had all been from the main island of Tongatapu. Only two confirmed cases were from the neighbouring small island of `Eua.

Vanuatu

In the first half of 1998, dengue fever activity was reported in Port Vila and the health department reported 131 clinical cases with eight serologically

confirmed cases (DEN-2) in mid-June. In December 1998, a further eight cases were serologically confirmed from Port Vila (DEN-2). The Ministry of Health has stepped up their mosquito control programme focusing on the reduction of mosquito breeding sites, chemical application in essential water containers, public health awareness campaigns and the use of insecticide-treated mosquito nets.

Viet Nam

DF/DHF is considered to be a major public health problem in Viet Nam, as it is a leading cause of hospitalization and death. In 1997, a large number of dengue cases were reported – a total of 108 000 cases with 245 deaths. In 1998, a total of 143 179 cases with 313 deaths were reported as of 30 November. This has been the highest number of cases ever known since 1991. Provinces in the southern region of Viet Nam were provided with materials for surveillance and testing and all provincial and district hospitals in the southern region were supplied with haematocrit equipment for the case management of DHF.

WHO's activities in

prevention and control of dengue in WPR

Since the early 1970s, WHO has been actively involved in the development and promotion of strategies for the treatment and control of dengue. In 1993, the Forty-sixth World Health Assembly confirmed that dengue prevention and control should be among the priorities of the Organization. Since then, global and regional strategies emphasizing the need for effective prevention, active surveillance and outbreak preparedness have been developed.

In Cambodia, Lao PDR, the Philippines, Viet Nam, and the Pacific Island countries/ areas, dengue control programmes have been established in collaboration with WHO to promote vector surveillance and control, public education and case management. In these programmes, vector control through community participation is emphasized. WHO's Western Pacific Regional Office (WPRO) is also involved in emergency disease intervention activities for outbreaks that occur in the Region. For example, when the dengue outbreak occurred in Cambodia in 1995, the government began intensive dengue intervention activities in collaboration with WPRO,

USAID, other governmental agencies and non-governmental organizations. WHO experts were sent to the country to provide technical support for these activities, and WHO also provided supplies and equipment. After proper control measures had been taken, the number of cases quickly decreased and the case fatality rate declined.

Outbreak Response Task Force

In April 1996, the Outbreak Response Task Force (ORTF) was established in WPRO in response to an increasing potential of the life-threatening outbreaks due to new, emerging, and re-emerging communicable diseases. The ORTF is involved in areas of surveillance, emergency preparedness, training, and research on emerging and other communicable diseases, including dengue, in the Region.

Regional stockpiles

To ensure rapid mobilization of supplies and equipment during an emergency, the Regional Office established regional stockpiles for vector-borne diseases, including dengue, in Cambodia and Fiji in 1996. The effectiveness of the regional stockpile was demonstrated during

the dengue outbreaks that occurred in Lao PDR in 1996, Cooks Islands in 1997 and, most recently, Fiji and Tonga in January 1998 and Cambodia in June 1998, when supplies were quickly sent to the countries.

Information exchange

In the area of information exchange, PACNET (the Pacific Health Surveillance Network), an Internet-based information network, was developed in 1996 which serves as a tool to quickly disseminate information to various countries and organizations on common public health issues that occur in the Pacific Islands, such as dengue outbreaks. The network was developed by UNICEF, the Pacific Community, WHO and other organizations. Also, WHO/WPRO has been publishing the annual *Dengue Bulletin* in collaboration with the South-East Asia Regional Office (SEARO) which provides information on various achievements in dengue control activities. In July 1997, a WHO WPR/SEAR Bi-Regional Meeting on the Prevention and Control of Dengue was held in Manila to exchange information on dengue and also strengthen international and inter-

regional collaboration to tackle the disease. Topics discussed in the meeting included disease surveillance; vector surveillance and control; laboratory diagnosis; case management; vaccine development; and information exchange, and conclusions were made to strengthen activities in these areas.

WHO collaborating centres

In the Western Pacific Region, there are three WHO collaborating centres on dengue virus which are located in Australia, Japan and Malaysia. In the laboratories of these centres, rapid serological and DNA diagnostic methods have been developed by using IgM-ELISA and PCR techniques in the past. Also, various dengue vector control methods have been evaluated, such as permethrin-treated nets and the use of copepods.

Conclusion

Since 1994, the incidence of dengue has been increasing in the Western Pacific Region. However, the case

fatality rate has been kept low at less than 1% due to improvement in case management and possibly due to improved public recognition of the serious clinical signs of the disease, leading to early access to health services. For countries where dengue is endemic, it is important that appropriate plans be established to properly respond to dengue outbreaks. Disease surveillance should especially be maintained at high levels in such countries to detect any increase in dengue cases and trigger early intervention.

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