

Dengue situation in Malaysia

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INTRODUCTION

Dengue has now emerged as one of the major public health problems in Malaysia. It was first reported in 1901 in Penang and since then the disease has become endemic throughout the country. The first case of dengue haemorrhagic fever (DHF) was reported in 1962. Subsequent to this, a major outbreak of DHF occurred in 1973 when almost the whole nation was involved. In 1974, a plan of action for prevention and control of dengue was put into immediate effect and the disease was made notifiable. The Destruction of Disease Bearing Insects Act (DDBIA, 1975) was introduced in 1975. In the last five years, between 1987-1991,¹ there has been an increase in the number of cases reported and in 1991, the country experienced the biggest outbreak of dengue. The 4-year epidemic cycle of dengue noted by Lo and Awin' prior to 1987 seems to be no longer true.

EPIDEMIOLOGY

The incidence of DF and DHF for the last five years is shown in Table 1. The median incidence rate for DF and DHF is 27.49 per 100,000 population. The data show an overall escalating trend in the annual incidence since 1988. All the states in the country were affected. However, the majority of cases were confined to the highly populated states, as shown in Table 2. For 1991, the most affected states and their respective incidence rates (per 100,000 population) were Federal Territory Kuala Lumpur (132.48), Sarawak (63.95), Johore (56.78), Pahang (40.98), Penang (39.89), Selangor (27.60), Negeri Sembilan (26.50) and Perak (24.12). For 1992 (Jan.- Sept.) 44.0% of cases were reported from the Federal Territory, 12.6% from Sarawak, 11.3% from Selangor, 8.3% from Johore and 5.6% from Perak.

The ratio of DF:DHF (1989-1991) varied from 4.0:1 to 8.0:1 (Table 3). There appeared to be an increase in the number of DF cases compared to DHF. This increase in the number of DF was probably due to over-reporting.

For the last five years, the majority of reported cases of DF and DHF were among the 5-29 years age group. For DHF, the age-specific morbidity rate was highest among the 20-29 years age-group, followed by 10-19 years and 30-39 years age groups. The ratio of male:female reported for DF and DHF ranged from 1.3:1 to 1.1:1. The majority of the outbreaks in the country showed an equal distribution between males and females (Table 4).

While all ethnic groups were involved, the majority of reported DF/DHF cases were among the Chinese followed by Malays, Indians and others (Table 5).

DF and DHF occur mainly among the urban population. For the last five years, the reported cases from urban areas contributed to 62.0% - 86.7% of the total cases (Table 6).

The case fatality rate (CFR) of dengue is shown in Table 7. For the last five years, the CFR ranged from 0.21% to 0.59% and the median was 0.43%.

The methods employed to confirm dengue infection include the haemagglutination inhibition test, dot enzyme immunoassay and IgM ELISA. Serology examination was not done for all reported cases. In 1990, out of a total of 4880 cases reported, only 2982 specimens (61.1%) were processed. Similarly, in 1991, out of 6628 total cases reported, only 4090 specimens (61.7%) were processed. For the last five years, the number of confirmed DF/DHF cases by serology ranged from 39.4% to 63.4% with an average of 47.3% (Table 8).

PREVENTION AND CONTROL

The strategies used in the prevention and control of dengue are contained in the Vector-borne Disease Control Programme Sixth Malaysia Plan³ and include:

- (i) Anti-larval measures which include larval surveys and source reduction of larval breeding habitats both indoors and outdoors. Larval surveys of both *Aedes aegypti* and *Aedes albopictus* form the basis for vector surveillance.

TABLE 1: Incidence rates of DF and DHF in Malaysia (1987-1991)

Year	Incidence rate (per 100,000 population)		
	DF	DHF	DF/DHF
1987	10.40	1.85	12.25
1988	7.05	1.38	8.42
1989	11.77	3.00	14.74
1990	23.85	3.63	27.49
1991	32.65	4.10	36.75

TABLE 3: Distribution of cases by DF:DHF Ratio in Malaysia 1987-1992 (Jan-Sept)

Year	DF:DHF ratio
1987	5.6:1
1988	5.1:1
1989	4.0:1
1990	6.6:1
1991	8.0:1
1992 (Jan-Sept)	6.8:1

TABLE 2: Incidence rates by States (1991) and percentage distribution of reported cases of DF/DHF in Malaysia 1991-1992 (Jan.- Sept.)

State	1991		Incidence rate (per 100,000)	1992 (Jan-Sept)	
	Cases No.	(%)		Cases No.	(%)
Perlis	22	(0.3)	11.32	7	(0.2)
Kedah	52	(0.8)	3.60	17	(0.4)
Penang	465	(7.0)	39.89	117	(3.1)
Perak	548	(8.3)	24.12	211	(5.6)
Selangor	561	(8.5)	27.60	422	(11.3)
F.Territory	1663	(25.1)	132.48	645	(44.0)
N.Sembilan	198	(3.0)	26.50	75	(2.0)
Malacca	73	(1.1)	12.21	36	(1.0)
Johore	1222	(18.4)	56.78	311	(8.3)
Pahang	441	(6.7)	40.98	131	(3.5)
Terengganu	60	(0.9)	7.87	136	(3.6)
Kelantan	98	(1.4)	7.85	35	(1.0)
Sabah	134	(2.0)	8.62	126	(3.4)
Sarawak	1091	(16.5)	63.95	470	(12.6)
Total	6628	(100.00)	36.75	3739	(100.00)

TABLE 4: Distribution of cases by sex. Malaysia 1987-1992 (Jan-Sept)

Year	Male	Female	M:F ratio
1987	1,141	884	1.3:1
1988	651	519	1.3:1
1989	1,004	808	1.3:1
1990	1,687	1,477	1.1:1
1991	3,629	2,999	1.2:1
1992 (Jan-Sept)	2,055	1,684	1.2:1

TABLE 5: Percentage distribution of cases by ethnic group. Malaysia 1987-1992 (Jan-Sept)

Year	Malay	Chinese	Indian	Others
1987	30.6	53.5	4.1	11.9
1988	37.9	53.8	7.4	0.9
1989	39.4	56.5	3.4	0.7
1990	35.9	57.8	4.4	1.8
1991	36.9	48.1	4.0	11.0
1992 (Jan-Sept)	35.3	47.7	5.5	11.5

TABLE 6: Percentage distribution of cases by locality in Malaysia, 1987-1992 (Jan-Sept)

Year	% Cases	
	Urban	Rural
1987	71.9	28.1
1988	62.0	38.0
1989	63.4	36.6
1990	73.5	26.5
1991	75.8	24.2
1992	86.7	13.3

(Jan-Sept)

TABLE 7: Distribution of case fatality rate (CFR) for Dengue in Malaysia 1987-1992 (Jan-Sept)

Year	No. deaths	No. cases	CFR %
1987	8	2,025	0.39
1988	3	1,428	0.21
1989	16	2,564	0.62
1990	21	4,880	0.43
1991	39	6,628	0.59
1992	19	3,739	0.51

(Jan-Sept)

- (ii) Anti-adult measures which include the destruction of infected adult *Aedes* mosquitoes through fogging activities as soon as a case is notified.
- (iii) Health education, an important aspect of dengue control activities, is integrated into the routine health education programme. Anti-dengue campaigns are scheduled at a 3-monthly basis i.e. January, April, July and October and whenever there is an outbreak. Wide publicity on prevention and control of *Aedes* mosquitoes is given through the mass media. Frequent press releases are made to update the public on the latest situation of dengue. Besides educating the public on the various aspects of dengue and its control, efforts are made to obtain public support and encourage community participation in source reduction activities. Assistance is obtained from local leaders and political dignitaries in launching exhibitions and in 'Search and Destroy' operations. Co-operation by private medical practitioners and treatment centres to notify DF/DHF to the health sector is continuously emphasized.

TABLE 8: Distribution of serologically confirmed cases of DF/DHF in Malaysia (1987-1991)

Year	No. cases reported	No. (%) cases serologically confirmed
1987	225	1283 (63.4)
1988	1428	653 (45.7)
1989	2564	1068 (41.7)
1990	4880	1924 (39.4)
1991	6628	3070 (46.3)

- (iv) The enforcement of DDBIA, 1975 which is aimed at controlling the breeding of *Aedes* mosquitoes.

ACTIVITIES AND ACHIEVEMENTS

The following activities were carried out in the prevention and control of dengue:

(i) Anti-larval activities

House inspection

House inspection was carried out to reduce breeding sites in all dwelling facilities. There has been a 10.3% increase in the number of houses inspected in 1991 as compared to 1990. For 1992, up to September, the number of houses inspected was 3,322,374. The number of houses found positive for larvae was 36,417 or 1.10% (Table 9).

The use of larvicide

The use of larvicide (temephos) had increased by 445.8% in 1991 as compared to 1990. For 1992, up to September, the amount of larvicide used was 343.5 kg. (Table 9).

Enforcement of Destruction of Disease-Bearing Insects Act. 1975

There have also been increases in the number of notices and compounds issued and the number of court actions taken for 1991 as compared to 1990. The increases were 10.4%, 31.0% and 14.3% respectively. In 1992, up to September, the number of notices issued was 10,367 and the number of compounds issued was 17,324. Fifty-one court actions were taken for the same period of time (Table 9).

(ii) Anti-adult activities

Fogging

Fogging is done whenever a case is reported and

TABLE 9: Anti-larval activities carried out in Malaysia, 1990-1992 (Jan-Sept)

	Year		
	1990	1991	1992 (Jan-Sept)
Number of houses examined	3,790,174	4,178,856	3,322,374
Amount of temephos used (Kg)	255.0	1,391.X	343.5
Number of notices issued	13,445	14,840	10,367
Number of compounds issued	16,081	21,074	17,324
Number of court actions taken	196	224	51

in 'high-risk' areas. There was an increase of 38.9% in the number of houses fogged in 1991 as compared to 1990. This was due to the increase in the number of outbreak areas. For 1992, up to September, the number of houses fogged were 1,458,324 (Table 10).

(iii) Health education activities

Health education is an ongoing activity and is continuously strengthened in order to gain public support and cooperation. For the first ten months of this year (Jan. - Oct. 1992) a total of 412,359 pamphlets and 25,667 posters were distributed. There were 570 exhibitions held and 332 dialogues were carried out.

(iv) Community participation

Interagency cooperation is very important in the control and prevention of dengue and is being emphasized. The agencies involved are from government, non-government and voluntary organisations. These agencies participated in source reduction activities, printing of health education posters and pamphlets and distribution of health education materials. They also facilitate health workers in prevention and control activities.

PROBLEMS AND CONSTRAINTS

- (i) There was delay and non-compliance in the notification of cases. From a sample analysis of cases reported in 1992, it was found that there was a delay in notification in

34.5% of cases. Similarly an analysis of a sample of laboratory results (Jan.-June 1991) showed that out of 1,026 serologically confirmed dengue cases, only 267 (26%) cases were notified as dengue. The majority (67%) of these specimens were obtained from private clinics and hospitals.

- (ii) There was a delay in fogging activities in certain local authority areas. An analysis of control measures in these areas (Jan.-May 1992) showed a delay in fogging for 72.2% of the cases reported.
- (iii) The presence of abandoned housing projects, squatters, vacant lots and cemeteries contributed to potential breeding sites in urban areas and made it difficult for the health staff to combat the problem.
- (iv) Neglected and unusual potential breeding sites such as refrigerator trays for defrosted water, roof gutters, cocoa pods, tyres depots and septic tanks also contributed to the problem.
- (v) There was inadequate public compliance towards prevention and control of Aedes breeding. It was found that 36,417 were positive for Aedes breeding out of 3,322,374 houses examined in Malaysia from Jan.-Sept. 1992.

CONCLUSION

Dengue is endemic in Malaysia, especially in the major towns. Thus concerted efforts have to be made by the health authorities to keep the incidence of cases low. Strategies to combat dengue have to be constantly monitored and reviewed as to their effectiveness and appropriateness. Community participation and support has to be continuously emphasized in all preventive and control activities so that dengue no longer remains as one of the major public health problems in the country.

TABLE 10: Number of houses fogged Malaysia 1990-1992 (Jan-Sept)

Year	No. fogged
1990	1,001,755
1991	1,391,528
1992 (Jan-Sept)	1,458,324

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