Control of DHF Outbreak in Cambodia, 1998

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Abstract
In January 1998, an unprecedented dry-season outbreak of dengue haemorrhagic fever (DHF) occurred in Phnom Penh. An immediate and adequate outbreak response quelled the outbreak which was limited to the Capital. However, the nationwide DHF case figures remained at the normal level during the dry months of April and May.

After June 1998, the expected sharp increase in the number of cases occurred: from 807 cases in May, the number grew to 3291 cases in July. The virus succeeded in spreading to many new areas, affecting, at the same time, 18 of Cambodia’s 22 provinces as compared to only six affected during the last epidemic of 1995. The virus had invaded rural areas down to a population density level as low as 45 inhabitants/km². Consequently, the population at risk, which was formerly restricted to urban and peri-urban areas, had suddenly increased from 1 485 000 to 7 350 000 living in 1 343 000 households.

During 1 January–31 December 1998, 16 215 cases of DHF were recorded in Phnom Penh’s two children’s hospitals and the 19 paediatric wards of hospitals in the provinces affected by the outbreak. The cumulative number of deaths among these cases was 475. The overall case fatality rate (CFR) of 2.9% in 1998 was lower than the CFR of 4.7% in the previous outbreak in 1995. However, the CFR in certain provincial hospitals was still very high (10%).
The control operations undertaken by the National Dengue Control Programme (NDCP) included Temephos application, ULV spray supported by a strong IEC-based programme across sectors and donors. DHF treatment and management facilities were upgraded at several Cambodian Children’s Hospitals and wards with WHO support.

Keywords: DF/DHF, Aedes aegypti, case fatality rate, Temephos, Red Cross, treatment and management of DHF, Cambodia.

Introduction

The first case of dengue haemorrhagic fever (DHF) occurred in Cambodia in 1962. Since 1980, when 347 cases and 20 deaths were reported, DHF has become a major public health problem in the country. DHF appears to be cyclic in Cambodia as in other countries in South-East Asia with large outbreaks occurring every two to three years (1). The last major outbreak occurred in 1995 when 10 199 cases, with 424 deaths, were reported in children, giving a CFR of 4.7%.

During 1998, strangely enough, a large number of DHF cases originating in Phnom Penh were diagnosed during the dry season, a phenomenon recorded for the first time. The number of cases during the 1995 dry-season outbreak were ten times less, thus indicating an impending epidemic of high proportion in the coming rainy season.

Dry-season morbidity – 1998

Beginning January 1998, a total of 247 cases of DHF were recorded in Phnom Penh. An immediate epidemic response operation was able to quell the locally-limited outbreak by March 1998 when the cases receded to 80 and 90 respectively during the dry months of April and May, thereby showing a reduction of about 55%.

Wet-season morbidity and mortality (1998)

With the onset of rains in June 1998, a sharp increase in DHF cases occurred nationwide when the number of cases rose from 807 in May to 4627 in July. These ultimately touched a figure of 16 216 cases with 475 deaths by December with a case fatality rate of
2.9%. However, in certain provincial hospitals CFR was as high as 10%. The monthly DHF figures for the period 1995–1998 are given in Fig.1. The epidemic spread to 18 of the 22 provinces of Cambodia as shown in Fig.2.

Measures taken for epidemic control
The following steps were taken in chronological order for the containment of DHF during the dry season:

- Control of the DHF outbreak in Phnom Penh (February);
- Fund-raising and implementation of epidemic preparedness measures to counter the nationwide DHF epidemic (March–May);
- Containment of the expected nationwide DHF epidemic (June–November).

Figure 1. Monthly DHF cases – 1995–1998

Figure 2. Distribution of DHF/DSS cases – July 98
Concurrently, the following epidemic preparedness measures were also undertaken:

- Development of a nationwide DHF action plan;
- Fund-raising;
- Strengthening of the clinical case reporting system;
- Setting up of a virological and immunological DHF disease confirmation network, including the differential diagnosis of murine typhus, enterovirus 71 and Japanese encephalitis;
- Refresher training for staff in hospitals and hygiene stations in preventive measures in dengue-prone provinces;
- Production of TV and radio messages, reproduction of leaflets and other IEC materials;
- Building-up stocks of larvicides, drugs, and equipment, and their distribution;
- Proactive distribution of Abate based on entomological surveillance;
- Peri-focal space spraying around early cases in conjunction with quarter-wide Abate distribution; and
- Large-scale distribution of Abate and space spraying when the epidemic threshold level was reached.

Elements of “crisis management” of DHF control included fund raising appeal by Centre national de maliariologie (CNM), coordinated by WHO, stepping in of International Federation of the Red Cross (IRFC) in a big way in emergency procurement of ULV spraying generators/ pick up trucks, requisite quantities of larvicide, distribution in packages of 20 grams (correct dose for a standard Cambodian jar of 200 litres). Magnitude of the task can be gauged by the fact that 56 tonnes of Temephos was distributed within three months to 560,000 households, protecting an estimated 2.6 million inhabitants. Most importantly, the newly set up geographical information system (GIS) for dengue control proved very helpful in determining the priority areas for control interventions. (Figure 3). National NGOs, the Cambodian Red Cross, the media and other sectors actively participated in the control of an epidemic which had
engulfed nearly 82 percent of the country.

**Clinical management of DHF cases**

The problems connected with the clinical management of DHF cases were addressed by despatching three teams of paediatricians to the provincial hospitals which had the highest case-load and CFR (Battambang, Takeo and Kg. Cham). In addition, medical equipment such as haematocrit centrifuges and paediatric blood pressure meters were distributed to children’s wards. Sufficient quantities of IV fluids, plasma expanders and perfusion sets to treat 10 000 children were sent through the courtesy of IFRC. These drugs were distributed directly by the Red Cross to the paediatric wards and hospitals which were in greatest need, according to a Joint MoH/WHO contingency plan. The most crowded of the Phnom Penh children’s hospitals, Kantha Bopha, was upgraded, with WHO support, by adding 100 additional dengue beds. The IFRC provided disease test kits (HIV/HBV/HCV/VDRL) to these hospitals, which performed up to 70 blood transfusions each day.
To sum up, it may be said, that there are options available in emergencies like the present DHF outbreak, like IFRC ever ready to step in for such large scale emergent and responsive actions.

**Long–term strategy for DHF control**

On the basis of the lessons learnt, a long–term strategy for DHF control should have the following elements:

1. The early warning system of the national dengue control programme should be strengthened for early detection and rapid response to prevent DHF outbreaks.

2. Preventive actions against vectors (*Aedes aegypti*) should comprise of regular treatment of jars with temephos through social marketing which costs only 7 US cents per household.

3. There is a need for designing a ‘jar lid’ which will permit harvesting of rain water but will not permit *Aedes* breeding.

4. Some supportive legislation/law enforcement might contribute to its general acceptance.

**Reference**