

Situation update of dengue in the SEA Region, 2007

Dengue epidemiology is multifaceted depending upon human behavior, climate and the movement of viruses and humans. Given the many aspects of dengue which interact directly or indirectly and at different temporal and spatial scales and usually in a nonlinear fashion, it is not surprising that it is difficult to identify a single key factor responsible for the particular dynamics of the disease. Daily, seasonal, and interannual variability in temperature, atmospheric moisture and rainfall all influence the dengue system in a variety of ways.

For the South East Asia Region as a whole, there is about 18% increase in number of reported cases and about 15% increase in the number of reported dengue deaths as compared to same period last year. There was substantial increase in the reported cases of dengue in Thailand, Indonesia and Myanmar.

The peak month in Indonesia was February, June in Thailand and July in Myanmar. In Indonesia the number of reported cases increased from 106,425 during Jan-Sept 2006 to 127,687 during the same period in 2007 (an increase by about 20% and it is expected to be higher as the transmission season begins in November-December each year). Similarly in Thailand the cases increased from 41,116 during Jan-Nov 2006 to 58,836 during the same period in 2007 (43% increase). From Jan- Sept 2007 Myanmar reported 9578 cases which is an increase of about 10 % as compared to 2006 with 8674 cases reported during the same period (table 1). For Thailand and Myanmar the transmission is low at the end of the year therefore there will not be significant increase in the number of cases reported in the remaining part of the year.

The case fatality rate in Thailand is below 0.2%, in Indonesia it is around 1% and in Myanmar it is slightly above 1%. However there are some focal outbreaks away from the urban areas that have case fatalities even up to 3 to 5% in both Myanmar and Indonesia.

Table 1: Reported dengue cases in Member countries in 2007 as compared to same period in 2006

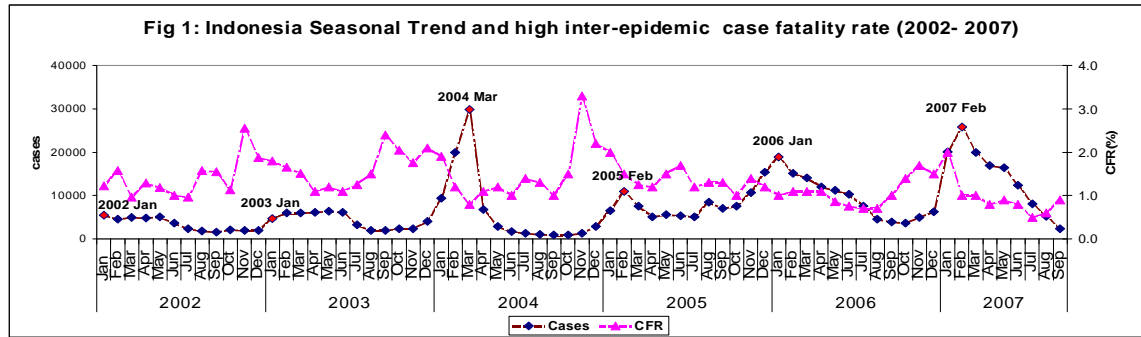
Country	Period of reporting	Cases		Death		CFR	
		2006	2007	2006	2007	2006	2007
Bangladesh	Jan-Aug	1752	85	3	1	0.17	1.18
Bhutan	Jan-Oct	106	112	0	5	0	4.46
India	Jan-July	1746	567	21	6	1.2	1.05
Indonesia	Jan-Nov	106425	127687	1027	1296	0.96	1
Maldives	Jan-Oct	2339	1494	9	1	0.38	0.07
Myanmar	Jan-Aug	8674	9578	102	117	1.18	1.22
Nepal	Jan-Aug	0	3	0	0	0	0
Sri Lanka	Jan-Nov	10406	5540	43	24	0.41	0.43
Thailand	Jan-Nov	41116	58836	59	81	0.14	0.13
Timor Leste	Jan-Oct	144	156	0	1	0	0.64
Total		172708	204058	1264	1532	0.73	0.75

Indonesia:

DHF is endemic throughout the country and is currently endemic in more than 300 regencies. *Aedes aegypti* is the principal vector species and breeds extensively in all the islands. All four serotypes (DEN 1 to 4) are endemic in most of the large cities of the country. In Indonesia dengue is predominantly endemic in urban areas where more than 35% of the country's population lives. In 2007 maximum cases were reported from Jakarta and West Java (each reported more than 25,000 cases). East Java and Central Java reported between 10,000 to 20,000 cases and Bali, East Kalimantan and Lampung, South Sumatra,

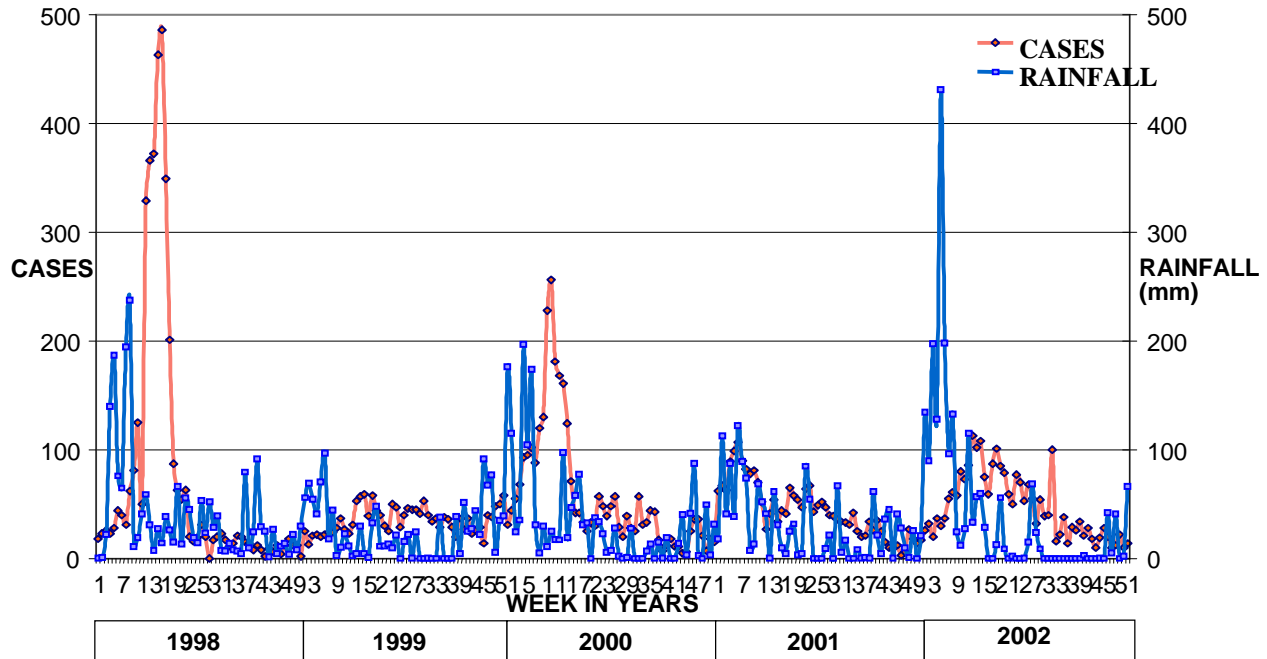
Yogyakarta, West Sumatra, North Sumatra, north Sulawesi, South Kalimantan, South Sulawesi reported between 1000 to 5000 cases each and the rest of the provinces reported less than 1000 cases.

Indonesia has maximum transmission in the early part of the year. Figure 1 shows inter-epidemic case fatality rate is above 1% in most years but case fatality rates are observed to be highest in the beginning of the transmission period. Small focal outbreaks in semi urban areas are reported to have higher case fatality rates than in urban areas probably due to better facilities in urban areas.



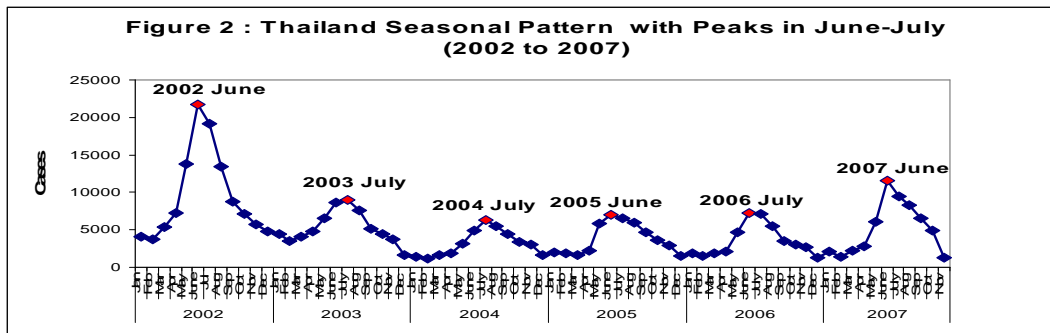
Studies suggest that rainfall patterns seem to be a reasonably effective predictor of time of peak dengue transmission which occurs about six or eight weeks after the peak in rainfall. A 5 year study in Indonesia (Figure below) shows DHF cases started to rise after about 4 weeks of the peak rainfall and within the next 4 weeks the peak dengue transmission was recorded.

**RELATIONSHIP DHF CASES WITH RAINFALL IN EAST JAKARTA
YEAR 1998-2002**



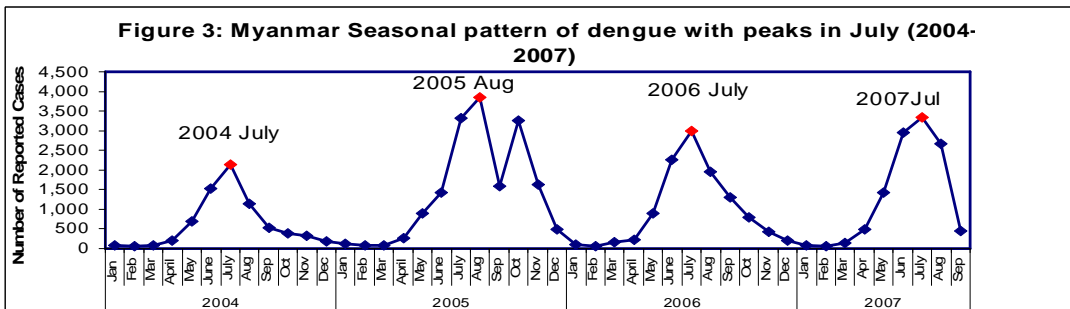
Thailand:

In Thailand every year dengue is reported from all four regions: Northern, Central, North-Eastern and Southern. In June outbreaks were reported from Trat province, 400 Km southeast of Bangkok, on the Cambodian border, Bangkok, Chiangrai, Phetchabun, Phitsanulok, Khamkaeng Phet, Nakhon Sawan, Phit Chit in Northern Zone of Thailand. Thailand has peaks in June- July as has been observed over the last few years



Myanmar

Dengue outbreak started in week 27 and week 28 was the peak period after which there was gradual reduction of the cases in the subsequent weeks. The states/divisions that reported maximum cases were Mon, Yangon, Ayayarwaddy, Kayin, Tanintharyi, Rakhine, Mandalay, Bago(W), Bago(E), Magway, Sagaing and fewer number of cases reported from a few more other states. Myanmar has peaks in July as has been observed over the last few years (fig 3)



Conclusion: Seasonality of the disease is well established in most countries now. Preventive measures should be targeted before the transmission begins and should be sustained throughout the transmission season. In the absence of effective mathematical predictive models, geographical or other, that considers different levels of risk of transmission and sensitive tools for identification of indicators of risk of transmission, countries should resort to making best use of the available epidemiological data, vector surveillance data and rainfall data to undertake preventive measures well ahead of the transmission season to prevent outbreaks.

In the absence of vaccines for prevention and effective anti-virals for treatment of dengue fever/DHF countries should enhance capacity of peripheral health workers in management of DF/DHF/DSS to reduce case fatality rates below 1%. Facilities should be improved so that case fatality rates are reduced as it has been observed that much higher case fatalities are reported in small focal outbreaks in smaller townships/ villages than in urban areas where there are better health facilities.

Way forward for Prevention and Control of Dengue/Dengue Hemorrhagic Fever would be through implementing the Bi-regional Dengue Strategy (2008-2015) consisting of six elements: (1) *Dengue surveillance*, (2) *Case management* (3) *Outbreak response* (4) *Integrated Vector Management* (5) *Social mobilization and communication for dengue* and (6) *dengue research* (combination of both formative and operational).