

## Dengue in Nakorn Phanom, Thailand

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**Abstract:** Dengue virus infection constitutes major health problem in Nakorn Phanom, Northeast Thailand. Its epidemic season in Nakorn Phanom tends to start earlier than entire Thailand, or even Northeast Thailand as a whole. This discrepancy could be due to its geographical and climatic condition in Mae Kong Valley. Recent hospital data indicate health transition as shown by the emergence of traffic accidents and adult diseases to be counted among top 10 causes of death or hospitalizations.

**Key words:** Dengue, Nakorn Phanom, Thailand

### INTRODUCTION

Dengue virus infection has been a major health problem in tropical areas in the world, by increased number of patients and expansion of epidemic areas. Especially in the southeast Asia, appearance of severe clinical manifestation of dengue haemorrhagic fever (DHF) since 1953 has created a serious problem for medical personnels (Hammon *et al.*, 1966; World Health Organization, 1966; Halstead, 1966; 1992). Nakorn Phanom Province cannot be an exception and has been suffering from attacks of dengue. In this communication, its unique features in Nakorn Phanom are described as well as recent trends of other diseases.

### MATERIALS AND METHODS

**Data sources:** Geographical, meteorological, and sociological data were taken from the description of Buppasiri (1993). Hospital statistics were summarized from the record of Nakorn Phanom Provincial Hospital, Thailand. Epidemiological data were collected from Department of Epidemiology, Ministry of Public Health, Thailand.

## RESULTS

**Geographical, meteorological and sociological description of Nakorn Phanom**

Nakorn Phanom Province is situated on the west bank of Mae Nam Kong River which borders Thailand and Lao P. D. R. Its area 5,512,688km<sup>2</sup> is divided into 10 Districts including its capital Nakorn Phanom City. The city locates at 17° 30' N and 104° 55' E with elevation of 140 m from sea level, and approximately 700km northeast from Bangkok, the capital of Thailand (Fig. 1). The land transportation from Bangkok is available by road communication, but there is no airline service, which commutes only to the neighboring provincial capital, Sakorn Nakorn. The climate of Nakorn Phanom is typical tropical Thailand. Although the maximum temperature is significantly high all year round, March and April are the hottest season, while November to February next year corresponds to cool season with relatively low minimum temperature (Fig. 2). Rainy season starts from May and continued to September to October, while November to April nesxt year corresponds to dry season (Fig. 3). The total population in Nakorn Phanom Province is 636,399 with 317,101 males and 319,298 females.

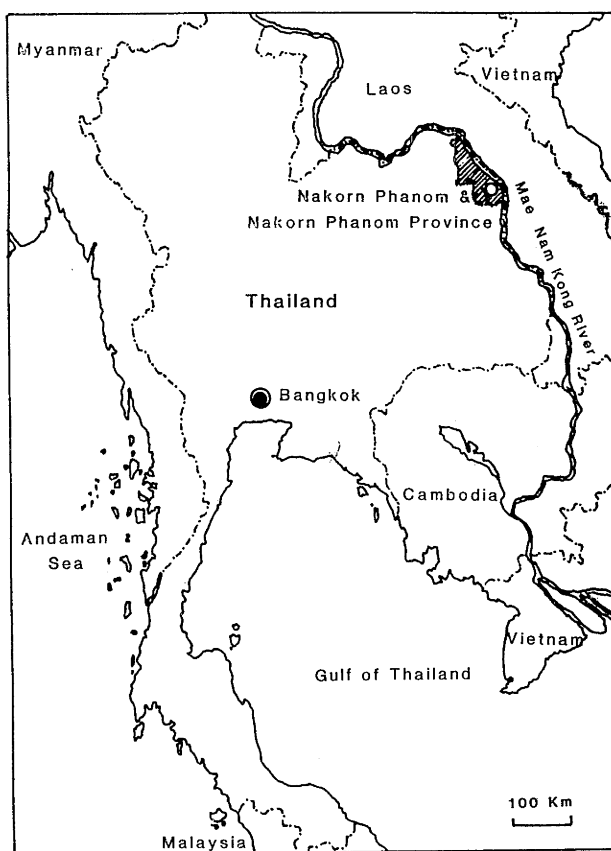


Fig. 1. Geographical location of Nakorn Phanom Province and its capital Nakorn Phanom City in Thailand

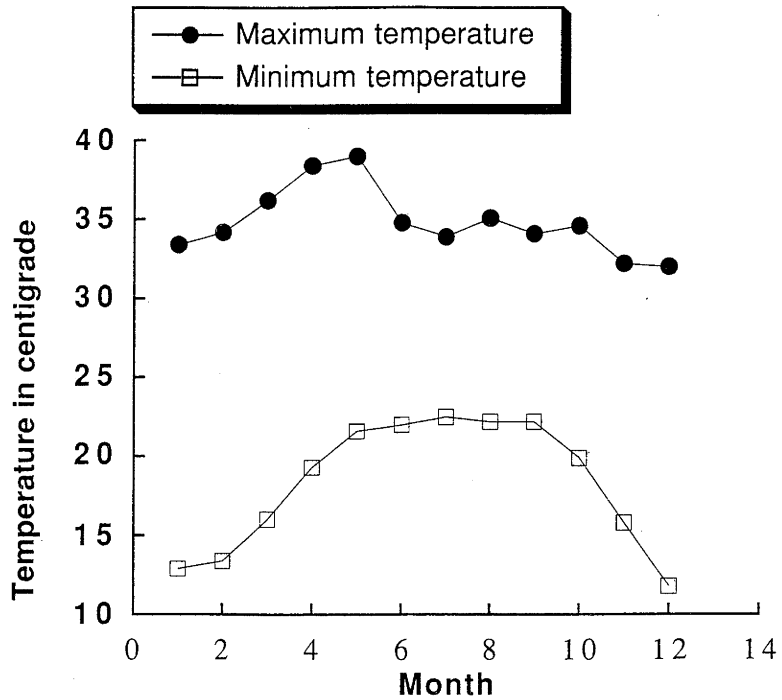


Fig. 2. Monthly maximum and minimum temperature in Nakorn Phanom, Thailand, 1991

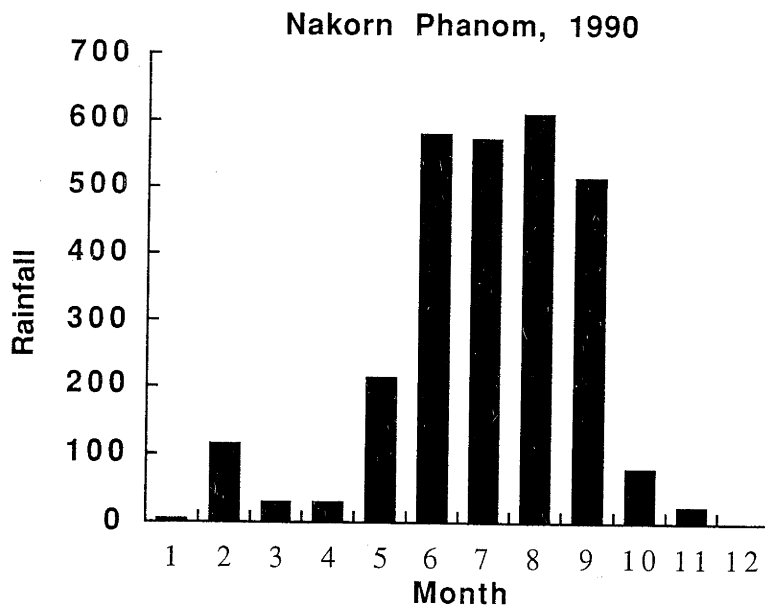


Fig. 3. Monthly rainfall in Nakorn Phanom, Thailand, 1990

### Health services in Nakorn Phanom Province

Tables 1 and 2 describes the number of medical personnels and facilities in Nokorn Phanom Province, respectively. Since medical service facilities are relatively limited in Nakorn Phanom, the Provincial Hospital functions both as reference as well as primary hospital. As a result, significant number of dengue patients visit the Provincial Hospital at early stage of the disease, which is an advantage for the studies on dengue.

**Table 1.** Number of medical personnels in Nakorn Phanom Province, Thailand

| Medical personnels |        | Number of population for 1 medical personnel |
|--------------------|--------|--|
| Categories         | Number |  |
| Medical doctor     | 44     | 14,369                                       |
| Dentist            | 9      | 70,248                                       |
| Pharmacist         | 13     | 48,634                                       |
| Nurse              | 193    | 3,276  |
| Health assistant   | 224    | 2,822  |
| Midwife            | 236    | 2,679  |

Modified from Buppasiri (1993)

**Table 2.** Medical service facilities in Nakorn Phanom Province, Thailand

| Categories             | Number of beds | Number of facilities |
|------------------------|----------------|----------------------|
| Provincial hospital    | 270            | 1                    |
| District hospital      | 60             | 1                    |
|                        | 30             | 2                    |
|                        | 10             | 6                    |
| Health center          |                | 1                    |
| Clinics                |                | 25                   |
| Pharmacy shops         |                |                      |
| Modern pharmacy        |                | 3                    |
| Dispensary for humans  |                | 46                   |
| Dispensary for animals |                | 5                    |
| Traditional medicine   |                | 17                   |

Modified from Buppasiri (1993)

### Statistical data at Nakorn Phanom Provincial Hospital, 1992

Table 3 shows number of outpatients and inpatients in each Clinical Department of the Nakorn Phanom Provincial Hospital in 1992. In the case of outpatients, largest number of cases visited Medical (33,926), followed by Pediatric (25,996) and Surgical (12,180) Departments. While, the largest number of inpatients were admitted to the Pediatric Department (5,868), which was followed by the Surgical (4,293), Medical (4,171), and Gyneco-Obstetric

**Table 3.** Number of outpatients and inpatients received in each Department of Nakorn Phanom Provincial Hospital, 1992

| Department          | ouptatients | inpatients |
|---------------------|-------------|------------|
| Medical             | 33,926      | 4,171      |
| Surgical            | 12,180      | 4,293      |
| Orthopedics         | 2,064       | 324        |
| Pediatrics          | 25,996      | 5,868      |
| Gyneco—obstetrics   | 6,527       | 3,458      |
| Ophthalmology       | 2,794       | 152        |
| Otorhinolaryngology | 5,349       | 177        |
| Dental              | 8,442       | 32         |

(3,458) Departments in this order.

Tables 4 and 5 show top 10 disease categories in outpatients and inpatients, respectively. In the outpatients, the largest number of patients suffered from respiratory diseases (20,826), which was followed by gastrointestinal (12,321) then parasitic (7,646) diseases. While the disease category was not identified for the largest number of hospitalization (1,188), however, pneumonia (1,156) and acute gastroenteritis (1,149) constituted the 2nd and the 3rd largest cause of hospitalization. Surprisingly, DHF as the cause of hospitalization was identified only for 647 cases. It should be reminded that the serological examination on the FUO (fever of unknown origin) cases which was previously performed at the Virus Research Institute, Thailand, demonstrated that approximately 2/3 of them were actually dengue. Also, mild cases of dengue sometimes could resemble to acute respiratory infection and some of the dengue cases complain abdominal pain or discomfort. Taking into these facts, real feature of dengue in Nakorn Phanom could be much larger than shown in these data.

Table 6 shows the top 10 cause of death in the Nakorn Phanom Hospital. It is a pity that the real cause of death was not identified for the largest number of fatal cases (49),

**Table 4.** Top 10 disease categories of outpatients in Nakorn Phanom Provincial Hospital, 1992

| Disease categories | Number of patients |
|--------------------|--------------------|
| Respiratory        | 20,826             |
| Gastrointestinal   | 12,321             |
| Parasitic          | 7,649              |
| Muscular and bone  | 4,983              |
| Unidentified       | 4,864              |
| Genito—urinary     | 4,807              |
| Neuropsychiatry    | 3,988              |
| Trauma & poisoning | 3,892              |
| Perinatal          | 2,835              |
| Endocrine          | 2,957              |

**Table 5.** Top 10 disease categories of inpatients in Nakorn Phanom Provincial Hospital, Thailand, 1992

| Disease category             | Number of inpatients |
|------------------------------|----------------------|
| Unidentified                 | 1,188                |
| Pneumonia                    | 1,156                |
| Acute gastroenteritis        | 1,149                |
| Accident                     | 762                  |
| FUO*                         | 652                  |
| DHF**                        | 647                  |
| Other infectious diseases    | 580                  |
| Car and motor cycle accident | 530                  |
| Malaria                      | 416                  |
| Anemia                       | 381                  |

\*FUO: fever of unknown origin

\*\*DHF: dengue hemorrhagic fever

**Table 6.** Top 10 cause of death in Nakorn Phanom Provincial Hospital, Thailand, 1992

| Disease category            | Number of deaths |
|-----------------------------|------------------|
| Unidentified                | 49               |
| FUO*                        | 38               |
| Heart disease               | 29               |
| Intracerebral hemorrhage    | 22               |
| Pneumonia                   | 21               |
| Infectious diseases         | 20               |
| Renal diseases              | 20               |
| Malaria                     | 15               |
| Accident                    | 13               |
| Car & motor cycle accidents | 11               |

\*FUO: fever of unknown origin

which was followed by FUO (38).

One of the recent disease trends, not only in Nakorn Phanom but also in whole Thailand, is the health transition. Although infectious diseases still occupy a major proportion of health problem, car and motor cycle accident or other accidents came up to significant numbers and counted among the top 10 cause of hospitalizations and death. Also heart disease at the 3rd and intracerebral hemorrhage at the 4th cause of death appear to imply that such adult diseases have been recent health problems.

#### **Epidemiology of dengue in Nakorn Phanom**

Fig. 4 shows monthly distribution of dengue patients in whole Thailand as well as North, Northeast, Central, and South of Thailand in 1991. In the whole Thailand, the largest

number of patients were reported in July, and same results were observed also in 1990, 1989 and 1987 (data not shown). The largest number of dengue patients were reported in July also in the North and Northeast Thailand in 1991, 1989, and 1987. Nakorn Phanom exists in Northeast Thailand. While in Central Thailand, where Bangkok Metropolitan area exists, the largest number of patients were reported in September in 1991; July in 1990, 1988, and 1987; August in 1989, respectively.

Fig. 5 shows monthly distribution of dengue patients in Nakorn Phanom Province from 1987 to 1991. Except 1989, the peak of dengue patients was observed in June, therefore the epidemic season of dengue tends to be 1 month earlier than in whole Thailand, or even in Northeast Thailand.

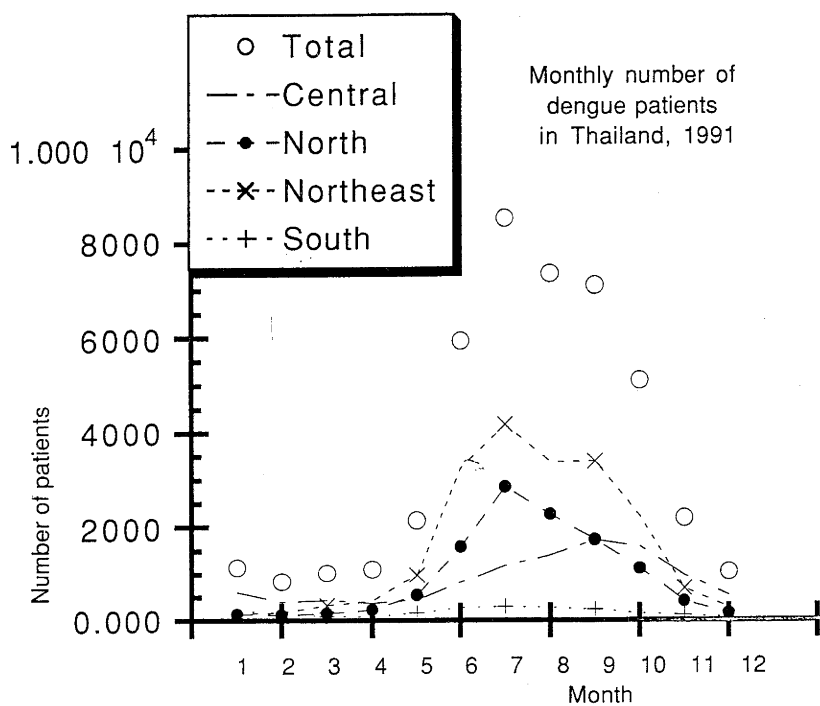


Fig. 4. Monthly reported number of dengue patients in whole Thailand and its regions in the north, northeast, central and south

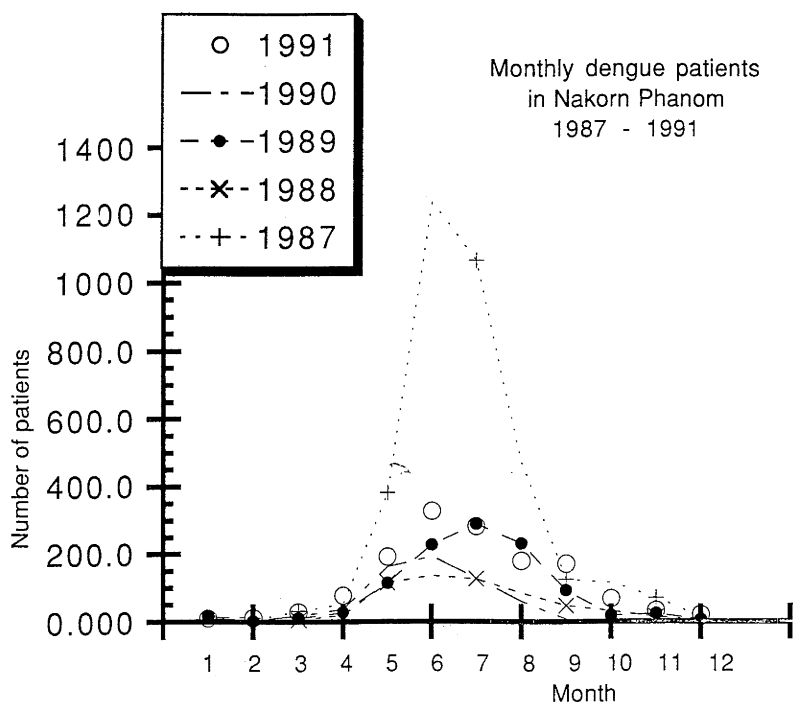


Fig. 5. Monthly reported number of dengue patients in Nakorn Phanom Province in the years 1987 to 1991

## DISCUSSION

Dengue in Nakorn Phanom is no less significant than other parts of Thailand or tropical areas in the whole world. Although hospital statistics did not clearly indicate that dengue is the leading cause of hospitalization in Pediatric Department. The reason why dengue epidemic in Nakorn Phanom tends to start earlier than entire Thailand or even other part of Northeast Thailand could be due to its geographical location. Nakorn Phanom, on the west bank of Mae Nam Kong River, is separated from other parts of the Northeast Thailand by elevations such as Phu Nang Ngoi, Phu Phan, Phu Lan Chang, and Phu Mae Nang Mon. These elevations at 500–600 m from sea level apparently block moistures brought by the Northeast monsoon from the Gulf of Tongking and cause abundant precipitation. It has been well-described that in rainy season increased number of water containers and high humidity provide favorable conditions for the breeding and activity of vector mosquitoes, leading to dengue epidemic.

Health transition in Thailand has been documented in recent years as a result of socioeconomic transitions (Kachondham and Chunparas, 1994). In spite of persisting tropical diseases, health personnels in Thailand are now facing with emergence of new disease categories to be leading cause of hospitalizations and deaths.



## ACKNOWLEDGMENTS

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