



## CHAPTER II

### LITERATURE REVIEW

#### 2.1 Introduction

This chapter reviews the International literature on dengue prevention and people's Knowledge, Attitude and preventive behavior of the disease. It then goes on to examine the mosquito vector, dengue virus, manifestation of dengue virus and the impact of the disease on the health care system. Knowledge of dengue is as an essential component of dengue fever prevention and will be discussed in the light of current literature.

#### 2.2 Knowledge, Attitude and Practice (KAP) studies on Dengue Fever

Swaddiwudhipong (1992) conducted a study on Knowledge, Attitude and Practice of the prevention of dengue fever in an urban community in Thailand. 417 households, selected by a systemic cluster sampling method, were interviewed. They found that more than 90% of them know that the disease is transmitted by *Aedes* mosquitoes and indicated water jars and water retention in the house as the common breeding places. However, the other two common breeding places, and traps and cement baths, were less frequently mentioned.

Gupta et al. (1998) conducted a study to assess the knowledge and attitudes about dengue and practice of prevention followed by the residents of a rural area and an urban resettlement colony of East Delhi. It was an interview based cross sectional KAP study which was undertaken in January 1997 to February 1997, a few months

after the dengue epidemic in rural area and urban areas of East Delhi. A pre-structured and pre-tested format containing the relevant questions was administered to the subjects. A total of 687 subjects (334 rural and 353 urban) were interviewed. Nearly four fifth (82.3%) of these were aware of Dengue. Audiovisual media was the most common source of information in both the areas. Knowledge about the disease was fair to good. Fever was the commonest symptom of the disease known to 92% urban and 83% rural respondents followed by symptoms of bleeding and headache. Mosquito was known to spread the disease to 71% rural and 89% urban respondents. More than two third respondents in urban and two fifth in rural areas had used some method of mosquito control or personal protection during the epidemic.

Kumar & Gururaj (2000) conducted a study on community perception regarding mosquito-borne diseases in Karnataka, India. The study revealed that more than 90% of the people interviewed perceived mosquitoes as a problem. However, this perception was with regard to the nuisance value of mosquito bites rather than disease-causing potential. Quite a large number of people did not know where the mosquitoes bred. More than one third of the interviewees did not know of any preventive measures against mosquitoes at the community level. Approaches based on social mobilization and communities aimed at bringing behavior change in the communities are stressed.

Van Benthem et al. (2002) conducted a study in knowledge and use of prevention measures related to dengue in northern Thailand. They found that of the 1,650 persons, 67% had knowledge of dengue. People with knowledge of dengue reported a significantly higher use of prevention measures than people without knowledge of dengue. In multivariable analyses, knowledge of dengue significantly

differed by age, sex, occupation and site ( $p < 0.05$ ). The authors did not give the directions of the associations.

Hairi et al. (2003) conducted a study on knowledge, attitude and practices (KAP) on dengue among selected rural communities in the Kuala Kangsar district. The study population was 1511 by simple random sampling method. The data was collected by face-to-face interview of the head of households using a semi-structured questionnaire and found that the knowledge on dengue of community was good. Cross tabulations were done between knowledge and practice, knowledge and attitude, and attitude and practice. There was no significant association seen between knowledge and practice. However, there was a significant association seen between knowledge and attitude towards Aedes control ( $p = 0.047$ )

Matta et al. (2006) conducted a study on Knowledge, Attitude & Practice (KAP) on Dengue fever: A Hospital Based Study. The study was done with the aim of assessing knowledge regarding Dengue fever among general population attending a hospital out-patient department. Another aim was to assess, whether simple preventive measures to check and destroy the breeding sites of mosquito like checking of coolers, discarded tires, flower pots etc. are being practiced in the community. Overall 500 interviews were taken in 28 days (from 1st October to 28th October 2003). Overall 82.4% respondents knew that dengue fever is transmitted by mosquito & 54% associated Dengue with flies/person to person transmission. Regarding knowledge about breeding, 399 (79.8 %) respondents knew about breeding places of mosquitoes. "Coolers" as the most probable breeding site (for mosquitoes) was named by 42.4% respondents followed by "cooler & tires" by 24.2%. In this study they

concluded that though the knowledge regarding dengue is good in the general population, practice of checking coolers, tires & flower pots is quite poor.

Claro et al. (2004) wrote an article on Dengue prevention and control: a review of studies on knowledge, beliefs, and practices. This article aims to contribute to dengue control programs through a review of recent studies on knowledge, beliefs, and practices concerning dengue and dengue prevention. The results show that adequate knowledge of dengue and prevention methods are found in close association with high rates of domiciliary infestation by *Aedes aegypti*. This suggests that traditional education strategies, although efficient in transmitting information, have failed to change population behavior. Qualitative studies reveal two important issues that appear to explain these attitudes: representations of dengue and risks associated with mosquitoes and difficulties in avoiding infestation of household water recipients due to sanitation problems in communities.

Chusongsang (2005) studied factors affecting dengue fever prevention and control behaviors of household leaders and primary school teachers in Khuankhanun District, Phatthalung Province. Logistic regression analysis was used. The results from univariate analysis showed that household leaders with higher level of knowledge had 3.73 times better prevention and control behaviors of DHF (OR=3.73, 95% CI=2.10 – 6.61)

Limros (2006) did a cross-sectional analytical study among health leaders of Konkrait District, Sukhothai Province. He found out that attitude score was positively correlated with knowledge score ( $p < 0.001$ ), but attitude, unlike knowledge, was not associated with elimination of breeding places. For community level cooperation against dengue infection, attitude was associated with campaign

( $p=0.001$ ), and frequency of information with spray use ( $p<0.001$ ) and coil use ( $p=0.022$ ).

Koenraadt et al. (2006) conducted a survey on Knowledge, Attitude, and Practice (KAP) in two sub-districts of Kamphaeng Phet province, Thailand, to test the hypothesis that correct dengue knowledge and practice reduce dengue vector populations. They found a negative association between respondents' knowledge of preventive measures and the number of unprotected containers in and around their houses. Knowledge of development sites was positively associated with unprotected containers. No relationships existed between knowledge of dengue and adult mosquito reduction practices. A higher number of unprotected containers increased the likelihood of the house being infested with one or more adult *Aedes aegypti*. Surprisingly, houses of respondents that used mosquito coils or had screening on doors and windows were significantly more likely to be infested (odds ratio =2.0) with adult *Aedes aegypti*. They concluded that there is a direct link between knowledge on dengue prevention and container protection practices, whereas measures against adult mosquitoes are used only when people experience a mosquito nuisance problem.

Community Awareness Survey on Dengue was done in December, 2007. The survey intended to determine the knowledge, attitude and practices on dengue among the population. A convenient sampling was used for the study and 2000 people participated in the survey. The respondent were from Male', Hulhumale' and K.Villingili. Among the respondents, 62.25% were aware of the type of dengue. They have recommended in the study that there is a need of public participation in controlling dengue (Male', Maldives, 2008).

In light of the survey's done on dengue fever it showed that knowledge was associated with the preventive behaviors of the people. Koenraadt et al. (2006) concluded in the study that there is a direct link between knowledge on dengue prevention and container protection practices, whereas measures against adult mosquitoes are used only when people experience a mosquito nuisance problem. The study done by Claro et al. (2004) showed that adequate knowledge of dengue and prevention methods are found in close association with high rates of domiciliary infestation by *Aedes aegypti*. Another study which was done by Van Bentem et al. (2002) showed that people with knowledge of dengue reported a significantly higher use of prevention measures than people without knowledge of dengue.

This showed that correct knowledge was needed in order to prevent from dengue fever. Along with all the support we need to provide the community with the precise knowledge regarding the disease and to clarify any doubts they have.

### **2.3 Dengue Virus**

It is a RNA virus belonging to Flaviviridae group consists of 4 serotypes, DEN-1 to DEN-4. All are capable of causing disease in humans. Recent trends show an increase prevalence of DEN-3 serotype.

### **2.4 Mosquito Vector**

Dengue Fever (DF) is caused by mosquito of *Aedes* group. The most important one is *A. aegypti* which is a day biting mosquito, rests indoors and can breed in small collection of water. Rainy season increases risk of DF as it increases larval population; ambient temperature and humidity favor viral propagation.

## **2.5 Human Activities that Influence the Spread of Dengue**

The phenomena of human population growth in the tropics and dramatic redistribution of the human population into urban centers have greatly influenced the epidemiology of dengue; the density and distribution of its vector. However, in the American region, the urban population exploded during the period 1970 to 1990 and it is in these urban areas that dengue has become a major health problem, while rural populations have been less affected. Insufficient municipal water supplies, necessitating the storage of water for drinking and washing, and poor sanitation (resulting in the great amount of devices that collect rainwater, e.g., bottles, cans, tires, etc) have been responsible for a huge expansion of *A. aegypti* populations in America. This coupled with a very large supply of susceptible human hosts has created a system ideal for the inexhaustible transmission of dengue viruses.

## 2.6 Manifestations of Dengue Virus infection

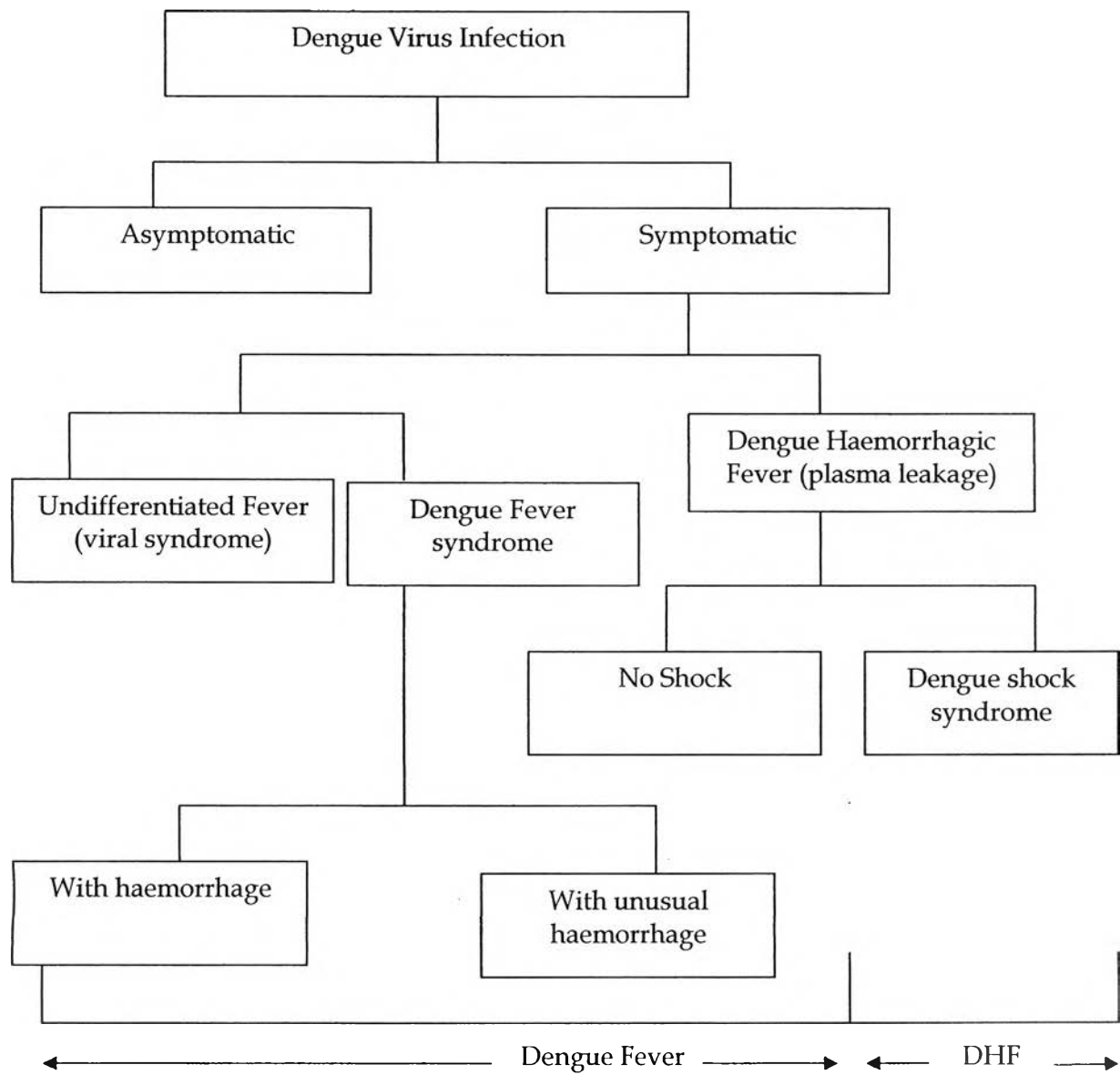


Figure 2: Manifestation of dengue virus



## **2.7 Impact of Dengue Fever in the Health Care System**

Clark et al. (2005) conducted a study on dengue fever and dengue hemorrhagic fever which constitutes a substantial health burden on the population in Thailand. In this study, the impact of symptomatic dengue virus infection on the families of patients hospitalized at the Kamphaeng Phet Provincial Hospital with laboratory-confirmed dengue in 2001 was assessed, and the disability-adjusted life years (DALYs) lost for fatal and non-fatal cases of dengue were calculated using population level data for Thailand. When they accounted for the direct cost of hospitalization, indirect costs due to loss of productivity, and the average number of persons infected per family, they observed a financial loss of approximately US \$61 per family, which is more than the average monthly income in Thailand. The DALYs were calculated using selected results from a family level survey, and resulted in an estimated 427 DALYs/million population in 2001. These results indicate that dengue prevention, control, and research should be considered equally important as that of diseases currently given priority.

Harving & Ronsholt (2007) conducted a survey on the economic impact of dengue hemorrhagic fever on family level in Southern Vietnam and this study shows that the average family cost of treating one child is approximately (USD 61) including direct and indirect costs. On average, the largest expenses were those related to the initial visit at a local general practitioner, the hospital bill and lost income for the parents. Dengue hemorrhagic fever is a large expense for a family and can rightly be considered as a substantial socio-economic burden in Southern Vietnam.

## **2.8 Summary**

This chapter has highlighted why people need to have good knowledge of dengue fever and provided literature from around the world which suggested that peoples' knowledge on dengue fever plays an important part in the prevention of the disease. It has described dengue virus, mosquito vector, manifestation of dengue virus and human activities that influence the spread of dengue. It has also provided information on the impact of dengue on health care systems. The following chapter describes the methods used for this research in detail.