

# CHAPTER I

## INTRODUCTION

### 1.1 Rationale and Background

Dengue Haemorrhagic Fever or DHF a kind of virus infection for which common house mosquito (*Aedes Species*) is the carrier of disease insect. Its still be the problem of country's public health. It has been found and reported since 1949. First outbreak in Asian countries from Philippines in the year 1954. The first outbreak in Thailand in the year 1958. The number of patient was 2,706 cases, 296 cases were died. Later it spreaded to other provinces where crowded of people and easy of communication. The disease spread to all of the country (Department of Communicable Disease Control, 1993: 1). Collecting of epidemiological report in regarding to the situation of Dengue Haemorrhagic Fever in three decades found that, the first decade (1958 - 1967) second decade (1968 - 1977) and the third decade(1978 – 1987). The incident rate of Dengue Haemorrhagic Fever was 10, 23 and 54 in a hundred thousand respectively. The mortality rate was 10% in first decade 3% in second decade and 0.3 % in the third decade. While the mortality rate decreased in 10% of the first decade. The incident rate increased 2.3 times of the second decade and increased in 2.3 times the third decade.

The tendency of case infected still monotonous increasing although the decrease in 1990-1992. In summarize, Dengue Haemorrhagic Fever still be the problem in country public health (Department of Communicable Disease Control, 1993: 1-2).

For the Epidemiology of DHF, in Thailand, during 1996-2003 the number of patients 67,017, 51,688, 129,954, 37,929, 87,960, 127,189, 87,824 and 69,289 the incident rate was 114.88, 87.49, 211.42, 61.09, 163.46, 209.14, 235.72 and 179.38 per 100,000 population respectively. The mortality rate in 1996 to 2003 in percentage were 0.33, 0.27, 0.30, 0.31, 0.23, 0.34, 0.21 and 0.17 respectively. The data mentioned found the rate of infected case increase in the year 1993 decrease in the year 1994, but the tendency of increasing in the year 1998 and the year 2001 there were two times of spreading that cause the total infected cases are 257,143 cases. And 569 cases of death. It was found that DEN-3 is the virus that virulent during that time. Mostly of patients are child among 5-9 years old (Department of Communicable Disease Control, Ministry of Public Health, 1997-1998) while the mortality rate decrease from 0.33% in the year 1996 to 0.17 % in the year 2003. The reason for contrary of incident rate was increased and mortality rate was due to the better quality of remedy, while the prevention of disease is worthless (Kumnuan Aungchoosak, 1988: 277-281). Spreading of disease at present day cause by factors that need to be considered. The community extension, boundary extension of the city, lack of water supply, people movement from outer and inner of the country. Incorrect used of chemical insecticide with the adult mosquitoes, that gain mosquitoes the resistance to chemical. (Thongcharoen P. and Jatanasen S., 1999: 1-39; Gubler DJ,1997: 1-22). The increased number of patients found in the rainy season with optimum temperature. Mosquitoes lay eggs, grow up in

places where water trapped to increase large amount of population. Dengue Haemorrhagic Fever can be a seasonal variation. The number of patient begins from May, and the peak is always in July in every year. Then the decrease go on until October and keep going on until February to begin the next cycle. Patients are always found either in the urban or suburban, but more in the suburban (Department of Communicable Disease Control, 2001: 5).

Nakorn Si Thammarat Province found yearly spread of Dengue Haemorrhagic Fever and the report incidence rate and fatality rate of the year 1997-2003 are shown in Table 1.

**Table 1: Number and incidence rate and Fatality rate in Nakhon Si Thammarat Province during the year 1997- 2003**

Year	Incidence Rate		Fatality Rate	
	Number of case / 100,000		Number of case / 100	
1997	1,225	95.46	2	0.11
1998	3,365	685.12	6	0.24
1999	957	76.25	3	0.16
2000	1,584	237.80	4	0.18
2001	1,615	292.45	6	0.23
2002	2,484	438.83	14	0.30
2003	882	71.59	6	0.14

**Source :** Report 506 Section of Epidemiology, Nakorn Si Thammarat Provincial Health Office year 2003

According to Table 1, number of patients found in the year 1997, 1998 and 1999 are 1,225, 3,365, 957 cases, the incidence rate was 95.46, 685.12 and 76.25 per 100,000 population for which they are higher than the rate of whole country in the same year, and still higher than the target of Ministry of Public Health limits the incident rate of DHF in all ages not more than 50 per 100,000 population. For the year 2002 January to December Epidemiology report number of cases report from patient record card was 2,484 cases and the number of patients died was 14 cases. The largest number of patients found are in Muang District.

Epidemiological surveillance report of Nakorn Si Thammarat Provincial Health Office, found the spreading all District in Nakorn Si Thammarat especially Muang District was the highest number of patients in continuously from 1998 to 2003 by the rate per 100,000 of 613.93, 186.42, 272.06, 443.34, 503.14, and 99.46 respectively. In the study of each Sub-District found Pho Sadet is high incidence rate from 2000 to 2002 in continuously and prevalence rate was 129.33, 268.67 and 697.50 per 100,000 population. The average patient were divided to 5-9 years was 37.9%, 10-14 years was 28.1%, 15 year or above was 18.0%, 0-4 years 16% (Nakorn Si Thammarat Provincial Health Office, 2002: 3). In separation to villages of Pho Sadet Sub-District, Moo 4 Ban Yuan Lair, found the highest incidence rate either male or female morbidity rate of the age group 5-9 years was 37.42%, the second is 10-14 year old in 28.87%. In the year 2001 morbidity rate of the age group 15 years or above found to be increased up to 28.41%. The minor of cases were found at Ban Pra Mongkoot.

Dengue Haemorrhagic Fever is, nevertheless, the controllable and preventable by eradication of *Aedes aegypti* larvae, the disease carrier. Mosquitoes as have been mentioned of, its life cycle are in four steps namely as Eggs, larva, pupae and adult. There for, the stage to be eradicated easily was larva and adult larva as they are the outdoor confined target in water trapped container. Nakorn Si Thammarat Provincial Health Office has tried the criterion in controlling *Aedes aegypti* larvae by chemical, physiology and bio-physiology, but not satisfy with the result, as it was only the official staff activity. There also need the participation of the people to practice preventing and controlling with continuity (Ministry of Public Health, 1999: 7-8).

May 2002, The author studied on basic research data by studied on the factor that influence behavior related to controlling *Aedes aegypti* larvae and guideline of analysing factor that related to PRECEDE PROCEED Framework (Green & Kreuter, 1991: 153) By interviewing 30 family health volunteers, Moo 4 Ban Yuan Lair, Pho Sadet Sub – District, Nakorn Si Tammarat Province. Their representative interrogated regard to the environment. They are 20 - 65 years old, but mostly 30-40 in 66.66%. Primary school 54.38%, used to get the matters of Dengue Haemorrhagic Fever form public health staff and health volunteers was 55.45%. They never eliminated *Aedes aegypti* larvae bleeding place 69.87%, like the discarded vessels or even water change of vases in a week. They even don't know how the Abate sand is to be applied, and neglect, or irregularly of entirely close water containers. In consider of various factors what we fond are,

**Predisposing Factors.** Most of them still lacked adequate knowledge about DHF disease 69.87% and everybody thought that they had not ability to prevent DHF and responsibility of preventing DHF was duty of public health staff. It would be affect to themselves lacking intention to conducting and destroying breeding places of *Aedes aegypti* larvae inside and around household and only 15.27% attempted to destroy *Aedes aegypti* larvae when they had been found in their house.

**Enabling Factors.** The community environment, their surrounding homes are threes and canals and some discarded vessels like broken pottery, plastic bottles, tires etc. Some family they don't know Abate sand and how to use it. The criterion in the pass, survey and control *Aedes aegypti* larva, usually it is the duty of public health staffs. They also propagare the news to the health volunteer staffs, and give the abate sand to people in the village in spreading season of Dengue Haemorrhagic Fever. People who get services from public health station, they by the same time get the information about the prevention of Dengue Haemorrhagic Fever by eradication of *Aedes aegypti* larvae breeding place, and *Aedes aegypti* larvae control.

**Reinforcing factors.** More than 50% to receive about Dengue Haemorrhagic Fever information from public health staff, health volunteers, the neighbor, the village messenger. They also set up the campaign for *Aedes aegypti* breeding place eradication once in a year. In practice of *Aedes aegypti* larvae control people do not close water reservoir like earthen jar at once 88.52% and do not destroy the discard that can trap water inside 68.57%, never burn or bury the unused or broken vessels 50%, cannot control or prevent Dengue Haemorrhagic Fever if without Abate sand 50%. People in

the village mostly they go to Maharat Nakorn Si Thammatat Hospital, Ban Yuan Lair public health station, and private clinic when they are ill.

In survey of mosquitoes breeding place in Moo 4 Ban Yuan Lair, Pho Sadet village houses that found *Aedes aegypti* larvae 83.10% (House Index or H.I. not more than 10) the vessels found *Aedes aegypti* larvae 30.15% (Container Index or C.I. not more than 10) the containers that found *Aedes aegypti* larvae are 132.42 in 100 houses (Breteau Index or B.I. not more than 50).

The mentioned above show that family health volunteers lack of knowledge of Dengue Haemorrhagic Fever, and the control of *Aedes aegypti* larvae breeding place, lack of perceived susceptibility and the severity of the disease, and also the process in control of *Aedes aegypti* larvae and the prevention of disease.

The criterion to prevention and control DHF usually its carry out by public health staffs, never get any cooperation from people in the village. That's why the concept of community participation, may do the better potential in health jobs the appropriate health education activities held on for the family health volunteers, as they are the persons who take care himself and the family members in health, particularly the basic care prior to promptly sent to the doctor. They are another way, the local human resource to cooperate on community, and family health volunteers development like activities coordinator between families and government part to solve the public health problems, and health development of family and community in concrete. The family health volunteers also take part in creation of community public health

development to people in continuously. This can be the reinforcing factor for people good health without exception. The health education activities is to be set up in Moo 4, Ban Yuan Lair, Pho Sadet Sub - District, Nakorn Si Thammarat Province, where spreading of Dengue Haemorrhagic Fever. The concept of family health volunteers participation can be the guideline for the activities preparations. The aim for activities is to readjust the behavior in controlling of *Aedes aegypti* larvae, one of the method to control spreading of Dengue Haemorrhagic Fever and the guideline for other public health organizations.

## **1.2 Research Question**

Could a health education program organized by using family health volunteers participation be effective developing *Aedes aegypti* larvae control behaviors among family health volunteers ?

## **1.3 Research Objective**

### **General objective**

To study on the effectiveness of a health education program applying the participation of family health volunteers in controlling *Aedes aegypti* larvae.



### **Specific objectives**

1. To study the change of *Aedes aegypti* larvae control behaviors of family health volunteers who participated in a health education program, as related to the following aspects :
  - 1.1 Knowledge of Dengue Haemorrhagic Fever and control of *Aedes aegypti* larvae;
  - 1.2 Perceived susceptibility of Dengue Haemorrhagic Fever;
  - 1.3 Perceived severity of Dengue Haemorrhagic Fever;
  - 1.4 Perceived cost -benefits of control *Aedes aegypti* larvae; and
  - 1.5 *Aedes Aegypti* larvae control practices of family health volunteers.
  
2. To compared *Aedes aegypti* larvae index in the community before and after the experimentation, as regards to:-
  - 2.1 House Index;
  - 2.2 Container Index; and
  - 2.3 Breteau Index

### **1.4 Research Hypotheses**

1. After the intervention, the experimental group who received a health education program using on family health volunteers participation would gain significantly higher *Aedes aegypti* larvae control behaviors than before the program, regarding:

- 1.1 Knowledge of Dengue Haemorrhagic Fever and *Aedes aegypti* larvae control
  - 1.2 Perceived susceptibility of Dengue Haemorrhagic Fever
  - 1.3 Perceived severity of Dengue Haemorrhagic Fever
  - 1.4 Perceived cost - benefits of *Aedes aegypti* larvae control
  - 1.5 *Aedes aegypti* larvae control practices
2. After the program, The *Aedes aegypti* larvae index would be decreased regarding the :
- 2.1 House Index
  - 2.2 Container Index
  - 2.3 Breteau Index

## 1.5 Variables of This Study

1. **Independent variable:** A health education program organized by using family health volunteers participation process for encouraging *Aedes Aegypti* larvae control behaviors of the participants.
2. **Dependent variables:**
  - 2.1 Knowledge of Dengue Haemorrhagic Fever and *Aedes aegypti* larvae control
  - 2.2 Perceived susceptibility of Dengue Haemorrhagic Fever
  - 2.3 Perceived severity of Dengue Haemorrhagic Fever
  - 2.4 Perceived cost - benefits of controlling *Aedes aegypti* larvae
  - 2.4 *Aedes aegypti* larvae control practices of family health volunteers

## 1.6 Operational Definitions of Terms

**Participation of family health volunteers** refers to the process of having family health volunteers understand the problem and make decision to plan and implement the program for controlling *Aedes aegypti* larvae.

**The family health volunteer** referred to one of the family member, who volunteered to take a health care of their family's member. In all families, there will be at least one person that be responsible for this task, and willingly for the duty. They can read or write, eager to know and available of studying time. The duty in the village they do on a group of houses including in schools.

**Health education program** referred to health activities that were arranged systematically by applying family health volunteers participation in community for household to change the behavior about the perceived susceptibility of DHF, perceived severity of DHF, perceived cost – benefits in controlling *Aedes aegypti* larvae for preventing DHF, participating in controlling *Aedes aegypti* larvae in community.

***Aedes aegypti* larvae** referred to *Aedes aegypti* larvae stages including pupa that found in water containers, some fragments with water trapped either the inner and outer house. They are all assumed a *Aedes aegypti* larvae.

**Knowledge of Dengue Haemorrhagic Fever and the control of *Aedes aegypti* larvae** referred to the ability of family health volunteers to explain, memory

and understand the cause of Dengue Haemorrhagic Fever, and life cycle of *Aedes aegypti* larvae also the communication, prevention, the breeding place of *Aedes aegypti* larvae and how to control the *Aedes aegypti* larvae. This can be checked by the questionnaire created by the researcher.

**Perceived susceptibility of Dengue Haemorrhagic Fever** referred to the perception of family health volunteers and family members about their risk to the Dengue infection, this can be tested by the rating scale interview format created by the researcher.

**Perceived severity of Dengue Haemorrhagic Fever** referred to the perception of family health volunteers of severity of the disease on one's body, whether death could occur, amount of time and money lost in treatment and time lost for working. This can be tested by the rating scale interview format created by the researcher.

**Perceived cost - benefits in control the *Aedes aegypti* larvae** referred to the perception of family health volunteers that controlling *Aedes aegypti* larvae is useful, and causes the good result, and to be tested by rating scale interview format created by the researcher.

***Aedes aegypti* larvae control practices as followed :**

Behavior in preventing DHF at home of family health volunteers such as :

1. Surveying the habitats of *Aedes aegypti* larvae every week.
2. Closing water containers for consumption immediately after use.

3. Sleeping under mosquito netting all the time both day and night.
4. Preventing and eliminating *Aedes aegypti* larvae breeding place either in the house and outside by doing these.
  - Plates under food container cupboard legs, by putting any chemical such as detergent powder, sodium chloride or vinegar in the water plate beneath cupboard legs or putting in used engine oil instead of water every month.
  - Cement tanks or other water containers in the bathroom or latrine by putting abate sand granules and add to them every 1-3 months or changing water every week.
  - Vases or containers for decorative plants or fresh flowers by changing the water every week or a soft tissue plug to the opening of vases.
  - Put eating - larvae fish for eat *Aedes aegypti* larvae like guppy, are kept in un lid of water container or a basin for water plants.
  - Clean and change of water the un lid containers like toilet reservoir, consuming water reservoir, foot ablution basin and all kinds of pets feeding containers. This could be done in every week.
  - Pieces of objects such as cans, fruits shells, coconut shells by turning them over or burning them every week.
  - Keep away of some miscellaneous or discarded container tub, earthen jar, can etc.

**House or premises Index** referred to the percentage of houses or premises with one or more habitats positive for *Aedes aegypti* or related species. It is calculated as follow:

$$\text{House Index ( H.I.)} = \frac{\text{Number of infested houses X 100}}{\text{Number of inspected houses}}$$

**Container Index** referred to the percentage of containers with one or more habitats positive for *Aedes aegypti* or related species. It is calculated as follow:

$$\text{Container Index ( C.I.)} = \frac{\text{Number of infested containers X100}}{\text{Number of inspected containers}}$$

**Breteau Index** referred to the percentage of containers with one or more habitats positive for *Aedes aegypti* or related species per total of houses. It is calculated as follow:

$$\text{Breteau Index ( B.I.)} = \frac{\text{Number of infested containers X100}}{\text{Number of inspected houses}}$$