

## CHAPTER II

# ESSAY ON DENGUE FEVER AND PERSUASIVE AMPAIGN: AN INTERVENTION TO PREVENT DENGUE HAEMORRHAGIC FEVER IN RATCHABURI ROVINCE, THAILAND

### 2.1 Introduction

In the South-East Asia region, the most successful country in the prevention and control of Dengue Heamorhagic Fever is Singapore. In recent years, the number of Dengue Haemorhagic Fever patients has decreased in Singapore, while there has been an increase in other countries of the South-East Asia region. The government of Singapore conducts regular and effective activities to promote reduction in the mosquitoes' breeding sources. Some of these campaigns are targeted to create awareness of breeding sources such as public toilets and people are encouraged to cooperate and help minimize these sources. Singapore has a strong central government to stimulate and encourage their people. Whereas, in South-East Asia, the *Ae.aegypti* control failed because the government has not addressed the real issue and also has been unable to sustain the activities initially started. Their-main concern is not to solve the problem but to go through the motions required to avoid blame and to keep their jobs.

The *Ae.aegypti* control failed in central and South America because of the lack of sustainability of their preventive and control programs. Instead of learning to accept responsibility for their own health destiny, people became dependent upon the government for the service. People refused to practice larval source reduction in their home. Although government monitoring and participation is required, in the long term, it

is inexpensive and sustainable to involve the people of these countries to reduce larval source reduction containers.

The persuasive campaign is an approach to reduce *Ae.aegypti* as the Campaigns are sustained communication efforts involving more than a single message for the purpose of social influence (Michael Pfau & Roxanne Parrott, 1993). At the same time, Persuasive campaign is a conscious sustained and incremental process designed to be implemented for a specific audience. (Michael Pfau & Roxanne Parrott, 1993)

## **2.2 Global Situation and Epidemic**

Only 29% of the world population lived in urban areas in 1950's, in the mid of 2001, the world population has increase to over 6 billion people and 46% live in urban areas. Although the Philippines have the first DHF epidemic in 1954 in south –East Asia, during 1779-1780 the virus had started a global epidemic with simultaneous outbreaks in 3 continents: South-East Asia sub region in Asia, Africa and North America. The major epidemic caused by their mosquito vectors was transported between population centers by sailing vessels in the port of cities of Africa, Asia and Americas.

During World War II hundreds of thousands of Japanese and Allied soldiers were susceptible to dengue virus infection, were constantly moving between countries in Asia and the Pacific. The war destroyed water system and water storage was increased for domestic use as well as for fire control and some containers used to collect rain water was moved between cities. The large numbers of equipment used during the war were left behind which made ideal larval habitats for *Ae.aegypti*.

In 1975, after World War II, DHF has emerged in the Pacific region and the Americas. The epidemic caused by multiple serotypes (hyperendemicity) and Dengue virus's geographic distribution has expanded. Hospitalization and death among children in many countries in South-East Asia become a leading cause of DHF.

In the 1980s, DENGUE 3 was predominant in South-Asia and genetically distinct from classic DENGUE 3. In East -Asia, epidemic occurred in both Taiwan and People's Republic China. On Hainan Island was reported its first DHF major epidemic caused by DENGUE 2.

Dengue is spread in the southern provinces of Guangdong, Guangxi, Hainan and Yunan. This is a small number when compared with other countries in South-East Asia. The DHF incidence cases from 1991-1998 are 902, 2, 359, 17, 6,114, 8, 637 and 76 cases respectively. The dengue haemorrhagic problem occurred in China because of the unhygienic conditions provided for construction workers and is also associated with tourism.

Dengue Haemorrhagic Fever (DHF) is one of the most important and newly emerging mosquito-borne tropical diseases. Geographical concerns on the increase of *Aedes aegypti* mosquitoes infestation, presently, dengue and dengue haemorrhagic fever epidemics, threaten more than 85 countries in Asia, the Pacific islands, the Americas and Africa, causing millions of (DHF) cases annually with thousands of deaths (S.B. Halstead & H. Gomez-Dantes). Its significance and rising importance is also affected by environmental problems associated with rapid urbanization and population movements.

## 2.3 Dengue Haemorrhagic Problem in South –East Asia

Urbanization of South-East Asia began after World War II, with millions of people moving from rural areas to the cities of the region. This rapid growth led to massive urban concentration in the cities of these countries. The uncontrolled population increase led to inadequate housing and destroyed waste management system. The new ecological setting was a major factor of dengue virus's epidemics.

Signification of Dengue/Dengue Haemorrhagic Fever in South-East Asia and Asia Region can be divided into 4 categories: A, B C and D.

Category A consists of Indonesia, Myanmar and Thailand which DHF is a major public health problem that caused death and hospitalization among children. Multiple virus serotypes circulating and *Aedes aegypti* is the principle epidemic vector and spread to rural area and cycle epidemics in urban centers with 3-5 years periodicity as shown in table 2.1.

Category B consists of Bangladesh, India, Maldives and, Sri Lanka. Cycle epidemic are becoming more frequent, multiple virus serotypes circulating and expanding geographically within countries as shown in table 2.2.

Category C: Bhutan and Nepal has no reported case and endemicity uncertain.

Category D: People's Democratic Republic of Korea has non-epidemic.

**Table 2.1: Number of Report Cases and Deaths of DF and DHF in the South-East Asia**

Region of WHO category A.

By Country, Years 1985-97

Year		Indonesia	Myanmar	Thailand	Total
1985	Case	13,588	2,666	80,076	96,330
	Death	460	134	542	1,136
	CFR(%)	3.39	5.03	0.68	9.1
1986	Case	16,529	2,092	27,837	46,458
	Death	608	111	236	955
	CFR(%)	3.68	5.31	0.85	9.84
1987	Case	23,864	7,231	174,285	205,380
	Death	1,105	227	1,007	2,339
	CFR(%)	4.63	3.14	0.58	8.35
1988	Case	44,573	1,178	26,925	72,676
	Death	1,527	64	179	1,770
	CFR(%)	3.43	5.43	0.636	9.496
1989	Case	10,362	1,196	74,391	85,949
	Death	464	62	290	816
	CFR (%)	4.48	5.18	0.39	10.05
1990	Case	22,807	5,242	92,002	120,051
	Death	821	179	414	1,414
	CFR (%)	3.60	3.14	0.44	7.19
1991	Case	21,120	6,772	43,511	71,403
	Death	578	282	137	997
	CFR (%)	2.74	4.16	0.31	7.21
1992	Case	17,620	1,685	41,125	60,430
	Death	509	37	136	682
	CFR (%)	2.89	2.20	0.33	5.42
1993	Case	17,418	2,279	67,071	86,768
	Death	418	67	222	707
	CFR (%)	2.40	2.94	0.33	5.67

Year		Indonesia	Myanmar	Thailand	Total
1994	Case	18,783	11,647	51,688	82,118
	Death	471	461	140	1,072
	CFR (%)	2.51	3.96	0.27	6.74
1995	Case	35,102	2,477	59,911	97,490
	Death	885	53	183	1,121
	CFR (%)	2.52	2.14	0.31	4.97
1996	Case	44,650	1,655	38,109	84,414
	Death	1,192	18	114	1,324
	CFR (%)	2.67	1.09	0.30	4.06
1997	Case	30,730	3,993	99,150	133,873
	Death	681	76	227	984
	CFR (%)	2.22	1.90	0.27	4.39

CFR: Case Fatality Rate

From table 2.1, among 3 cities in category A, Thailand has the most reported cases and Indonesia has the most reported death. The numbers from Myanmar may not be accurate because of the country's under-development of the health care system. However, these numbers could be helpful in estimating the epidemiology trend.

**Table 2.2:** Number of Report Cases and Deaths of DF and DHF in the south-East Asia

Region of WHO category B.

**By Country, Years 1985-97**

Year		India	Maldives	Sri Lanka	Total
1988	Case		2,054	10	2,064
	Death	NA	9	0	9
	CFR (%)		0.43	0.00	0.43
1989	Case			203	203
	Death	NA	NA	20	20
	CFR (%)			9.85	9.85
1990	Case			1,350	1,350
	Death	NA	NA	54	54
	CFR (%)			4.00	4.00
1991	Case	6,291		1,048	7,339
	Death	3	NA	31	34
	CFR (%)	0.05		2.96	3.01
1992	Case	2,683		656	3,339
	Death	12	NA	15	27
	CFR (%)	0.45		2.29	2.74
1993	Case	11,125		750	11,875
	Death	36	NA	7	43
	CFR (%)	0.32		0.93	1.25
1994	Case	7,494		582	8,076
	Death	4	NA	7	11
	CFR (%)	0.05		1.20	1.25
1995	Case	7,847		440	8,287
	Death	10	NA	11	21
	CFR (%)	0.13		2.50	2.63
1996	Case	16,517		1,298	17,815
	Death	545	NA	54	599
	CFR (%)	3.30		4.16	7.46
1997	Case	1,177		980	2,157
	Death	36	NA	17	53
	CFR (%)	3.05		1.73	4.78

CFR: Case Fatality Rate

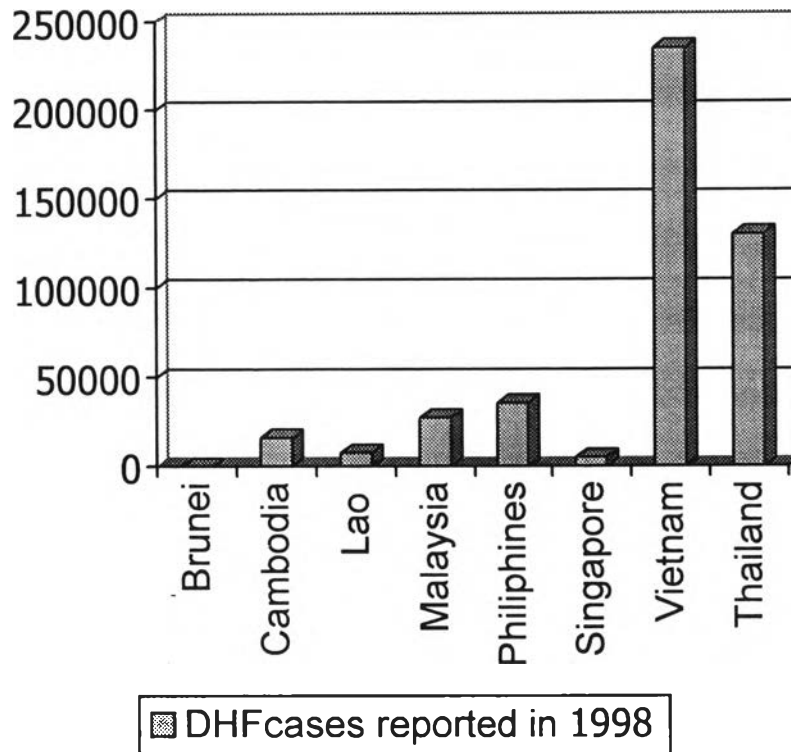
From table 2.2, there are no reported cases from Maldives, so Maldives cannot be compared with other countries. Sri Lanka is a small country but reported death during 1991-1995 in the average is more than India which is a bigger country with an enormous population. The epidemic period is in 1996 and shows that India is one of the endemic areas of DHF in south Asia.

The situation of DHF epidemic can be seen from resurgences dengue/DHF in Singapore during 1990-1994. A control program has succeeded in preventing the transmission. However, there is mass dengue outbreak in South-East Asia and Singapore is one of the countries that has dengue epidemic. Dengue haemorrhagic Fever incidence occur 5,285 cases and 1 death.

In 1998, Lao has dengue reported case 7,671 and 30 deaths. Cambodia has only dengue haemorrhagic fever reported cases (not include Dengue shock syndrome and Dengue Fever like other countries) 16,216. Malaysia has dengue reported cases 27,379 and 58 deaths. The Philippines has 35,648 reported dengue cases and 514 deaths. Thailand has 129,954 cases and 424 deaths. In Vietnam children less than 15 years of age have been the most affected (71.6%), dengue reported cases 234,920 and 377 deaths.



**Figure 2.1:** Dengue Haemorrhagic Fever reported cases in South-East Asia in 1998



As in Figure 2.1 during the mass DHF epidemic in South-East Asia in 1998, Vietnam and Thailand have more than one hundred thousand people infected with dengue virus while surrounding countries are lower.

#### **2.4 Dengue Haemorrhagic Fever Problem in Thailand**

DENGUE 2 serotype is a major vector in Thailand and DHF occurs during rainy season from May to October. The peak period of the disease occur in June and July.

The first DHF recoded in Thailand was in 1949 in Bangkok. Thereafter, there were more than 1,500 cases reported. In 1958, Bangkok had a major DHF outbreak which also spread to the surrounding provinces.

The national dengue control campaign was established in 1974. It is a vertical program whose activities focus mainly on chemical spraying because it is acceptable by the health workers. In 1983-1992, the strategy has changed to primary health care with cooperation from health volunteers to survey the breeding sites and larvae control.

In 1987, DHF spread country-wide, the morbidity rate per 100,000 population was 325.13 which became the highest in the past 30 years, and the morbidity rate rose again to 211.42 per 100,000 population in 1998.

The Ministry of Public Health launched the prevention and control program which decreased the morbidity rate to 40.38 per 100,000 population (24,826 cases) and case fatality rate is 0.22, in 1999. Even though the case fatality rate had decreased to 0.18% in 2001, but the dengue haemorrhagic fever incidence rose to 132,082 cases and most of the patients were children. The significance is dengue haemorrhagic fever causes death and children life are worth to the country. They should not be at risk for getting this disease.

**Table 2.3:** Morbidity, mortality and case Fatality rates of Dengue Haemorrhagic Fever in Thailand during 30 years, 1972-2001.

Year	Cases	Deaths	Morbidity Rate (/100,000)	Mortality Rate (/100,000)	Case Fatality Rate
1972	23,782	685	61.81	1.78	2.88
1973	8,280	315	20.92	0.80	3.80
1974	8,160	328	20.05	0.81	4.02
1975	17,767	438	42.43	1.05	2.47
1976	9,616	361	22.43	0.84	3.75
1977	38,768	756	88.28	1.72	1.95
1978	12,547	308	27.93	0.68	2.45
1979	11,478	127	24.92	0.28	1.11
1980	43,328	403	91.96	0.85	0.93
1981	25,670	257	54.06	0.54	1.00
1982	22,250	159	45.89	0.33	0.71
1983	30,025	559	60.71	0.46	0.76

Year	Cases	Deaths	Morbidity Rate (/100,000)	Mortality Rate (/100,000)	Case Fatality Rate
1984	69,101	496	137.12	0.98	0.72
1985	80,076	542	154.94	1.05	0.68
1986	27,837	236	52.88	0.45	0.85
1987	174,285	1,007	325.13	1.88	0.58
1988	26,926	179	49.37	0.33	0.66
1989	74,391	290	133.95	0.52	0.39
1990	92,005	414	13.43	0.74	0.45
1991	43,511	137	76.79	0.24	0.31
1992	41,125	136	71.16	0.24	0.33
1993	67,017	222	114.88	0.38	0.33
1994	51,688	140	87.47	0.24	0.27
1995	60,330	183	101.46	0.31	0.30
1996	37,929	116	63.09	0.19	0.31
1997	101,689	253	167.21	0.42	0.25
1998	129,954	424	211.42	0.69	0.33
1999	24,826	56	40.38	0.09	0.22
2000	18,617	32	30.19	0.05	0.17
2001	132,082	238	N/A	N/A	0.18

Source: Epidemiology Division, Ministry of Public Health, Thailand

## 2.5 Dengue Haemorrhagic Fever Biology

Dengue haemorrhagic fever in Thailand and neighboring countries in South East Asia occur from Dengue virus that is called dengue hemorrhagic fever (DHF), which have high incidence in each year. The patients may experience shock and die suddenly if they do not receive proper diagnosis and treatment. This disease was recorded as an emerging disease 40 years ago, and the first epidemic appeared in Philippines in 1954. Thailand had the first epidemic in 1958, and mostly children aged less than 16 years and only some adults were infected.

### 2.5.1 Cause of the disease

Dengue caused by RNA virus of the Flaviviridae Family, group B arbovirus that has 4 serotypes, DEN 1,2,3,4. These four serotypes have composition antigen which cause cross-reaction and have cross protection in a short period. If any person is infected with one of the four types, she/he will have permanent immunity and partial immunity from other 3 types for 2-6 months. A secondary dengue infection from different serotypes as the first time is a major cause of the dengue hemorrhagic fever.

From the study in the hospital AFRIMS the results shows that 85%-95% of primary dengue infection DHF patients aged less than 1 year old, every case has passive dengue antibody from DHF infected mother.

Four dengue types are found in Bangkok. DEN 2 can be found all the time and others only during some periods.

### 2.5.2 The epidemic

Female *Aedes aegypti* mosquito is a vector of DHF by biting in the daytime and consuming blood. When the mosquito bites the high fever patient the virus is transmitted to RNA. The virus flow through the mosquito's stomach and stay at the stomach wall. The virus increases and then goes into salivary gland, ready too transmit to human body in the next bite.

The cycle of the mosquito is about 8-12 days. The transmission may occur after the bite. When the mosquito is disturbed during the bite then the mosquito cannot finish feeding. It will bite another person or multiple feeding and transmit the virus to the

human body. When the virus infects a person, the incubation period range from 3-15 days (usually 3-5 days) before any signs and symptoms of dengue occurs.

### **2.5.3 Risk factors of DHF**

#### **A. Host**

- Age: In case of the second infection, children have higher risk than adults.
- Race and biology: Example of Negro in Cuba has DHF/DSS less than the whites.
- Sex: Females have DSS and death rate higher than males.

#### **B. Immune**

- In the simultaneously endemic of multiple dengue serotypes is the risk area of infecting DHF.
- A sequentially endemic of dengue virus is a risk factor of second infection from DEN 1 and DEN 3. The study in Rayong Province, Thailand found that after the first infection with DEN 2 and followed by a second infection with DEN1 has higher risk than others.
- The secondary infection has higher risk of DHF than the first infection around 160 times, 87-99 % of DHF/DSS cases are second infection. Mostly, the patients who have symptoms from the first infection are babies aged below 1 year old and every case has dengue anti-body from mother.

- Virulence: DEN 2 genetic subtypes can be divided into five groups. In Thailand DEN 2 subtype is in two groups. These 2 groups have the virus that causes DHF/DSS. This subtype is transport to America Continent in 1980. Therefore, the vaccination for dengue virus appropriate to use.

### C. Vector

- *Aedes aegypti* is the major vector and can be epidemic even though they are smaller in number, but they can spread.
- *A.albopictus* breeds in water stored in the bamboo or holes in the trees. *A. aegypti* breeds in artificial containers.
- The temperature and humidity in the raining season is appropriate for breeding, only 2-3 *Aegypti* mosquitoes can spread the dengue. During rain, it is mostly the children and the mosquitoes who stay indoors, so the children are exposed to a higher risk of mosquito biting.

Presently, we do not know the prevalence of mosquitoes that cause DHF epidemic but the prevalence of *A.aegypti* in Thailand have shown that they are very high and may even be higher than other countries. These 3 factors, host, immune and vector have the composition to encourage increasing DHF/DSS.

#### 2.5.4 Diagnosis

After the dengue infection, the incubation period is 5-8 days. The patients have symptoms of different severity from illness-like fever like dengue/DHF to DSS and death. Four characteristics of DHF symptoms are as follows:

(1) High fever for 2-7 days

Every DHF case has emerging high fever 38.5 Celsius until 40-41 Celsius. In some children who have a history of infantile convulsion, babies aged less than 6 months may experience convulsions.

The patients have flushed face and injected pharynx. Mostly, patients have running nose cough that can be diagnosed as different from measles and respiratory system. The older child may have pain behind the eyes during this period. Some other symptoms that appear is not wanting to eat any thing, vomiting and some have stomach ache, joint and muscle pain.

(2) Bleeding on the skin

In very severe cases, some patients may vomit and have bleeding in the intestines and may experience a long period of shock.

(3) Liver enlargement and Associated Pain

The liver will enlarge 3-4 days after the dengue infected person get sick. The liver get softer and it will be painful when pressed. This kind of symptom occurs in Thai children but people in some other countries do not have this kind of symptom.

(4) DSS (shock syndromes)/ problems of blood flow

Approximately one-third of Dengue Haemorrhagic Fever's patients have problems of blood flow occur because of the leakage of plasma in the lungs and stomach. If it leaks too much, it will cause hypovolemic shock that mostly occur suddenly together with a decreasing of body temperature.

The patient will get worse and anxious, having cold feet and the blood pressure changed, with pulse pressure equal to or less than 20 mm. Mostly, the patient who has shock syndrome will still be conscious, complaining and thirsty. Some patients have a sudden onset of stomach ache, before getting into shock.

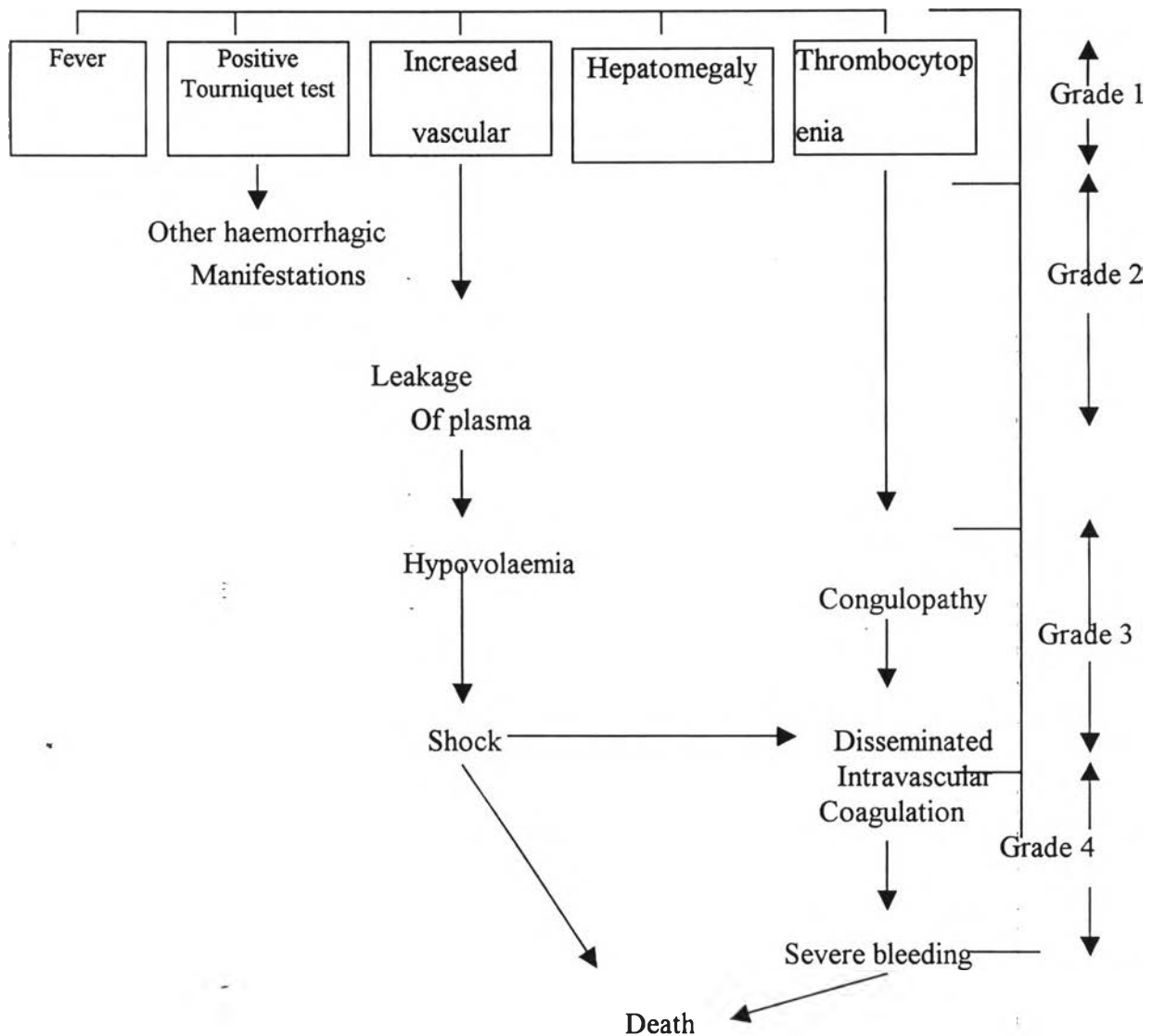
Sometime the diagnosis may be wrong, and the shock syndrome may not be cured in time. When the symptoms worsen, the lips start getting green, the body becomes cold, the skin become purple (profound shock), gets unconscious and dies within 12 – 14 hours. At the onset of the shock syndrome, if the diagnosis is accurate (before profound shock), the patient can be successfully treated and recovery can be swift.

#### **2.5.5 Clinical manifestations**

The grade of DHF severity ranges in 4 grades as illustrated in Figure 2.2. No shock is in the grade 1 and 2. Spontaneous hemorrhage occurring in grade 2. Grade 3 means that the patient is in shock and grade 4 being the most severe is when the patient is in profound shock.



**Figure 2.2: The spectrum of Dengue Haemorrhagic Fever Dengue Infection**



Source: Dengue haemorrhagic fever-Diagnosis, treatment, prevention and control, 2 edition, World Organization, Geneva

### 2.5.6 Treatment

Presently, there is no vaccination to prevent DHF and the patient is given symptomatic treatment. The treatment will be effective if the physician accurately diagnoses the disease at the onset, and must understand the nature of Dengue. He/she

should also prescribe the treatment according to the established guidelines, during the critical 24-48 hours of plasma leak.

Treating with paracetamol, instead of aspirin to lower the temperature is recommended, as aspirin may lead to bleeding in the stomach, and also may lead to Reye syndrome. It is therefore advisable to stop using paracetamol after the body temperature is decreased to 39 degrees Celsius, as paracetamol use may affect the liver. The body temperature can be lowered by sponging the patient with a cloth/towel soaked in water at room temperature.

### **2.5.7 Prevention and control**

There are three factors which cause DHF epidemics

#### **A. Agent:**

Dengue serotype, DENGUE 1, DENGUE 2, DENGUE 3, DENGUE 4

#### **B. Host:**

Risk group are children aged 0-14 years old. As DHF occurs only in humans, so we are reservoir of infection. The vaccination is the only thing that can build immune system in our body however the provided vaccine is used for all dengue 4 serotype (Tetravalent vaccine). This can prevent DHF and other symptoms during the illness. If we use Monovalent or Bivalent vaccine and are infected with any Dengue serotype, such vaccination may cause the severe symptoms later. The development of Tetravalent vaccine is on research, use 4-5 years to success.

### C. Environment or vector

Decreasing mosquitoes is only one control strategy of Dengue in these days.

There are four approaches to control vector

- 1) Decrease the breeding sources or Physical control
  - Turn over the containers or material with water storage.
  - Burn the garbage
- 2) Larvicidal or “focal” control of *Ae. aegypti*
  - Release larvae eating fish or larvivorous fish
  - Abate sand or temephos sand granules: it is in an Organohosphate insecticide type which has colourless crystalline solid (pure compound).  
The chemical inside the sand will glaze the inside containers wall up to the water surface. This will make the larvae cannot breath and die.
- 3) Get rid of adults mosquitoes or using chemical control
  - Spray Ultra Low Volume (ULV) Chemical spray that spray Thermal
  - Fogging, spray by spraying machine
- 4) Decrease Man-Mosquito Contact
  - use bed net while sleeping
  - use bed net previously treated with insecticide while sleeping
  - use insect repellent lotion or gel
  - use mosquito coils
  - use mosquito incense

## 2.6 Previous Intervention

In 1999, the Ministry of Public Health launched the National Dengue Prevention and Control plan (NDPCP) to celebrate His Majesty the King's 72 (sixth cycle) birthday.

Dengue Haemorrhagic Fever incidence cases in Thailand has decreased obviously in 1999-2000 as shown the figure 2.3. There were some successes in implementing the program. However, many difficulties were encountered in operating the program: insufficient budget, community's lack of awareness for control and get rid of breeding sources, community's reliance on the government in the prevention effort, insufficient coverage of prevention program and lack of continuity. (Disease Control department 2000: 13)

Figure 2.3: Dengue Haemorrhagic incidences cases in Thailand during 1989-2001.

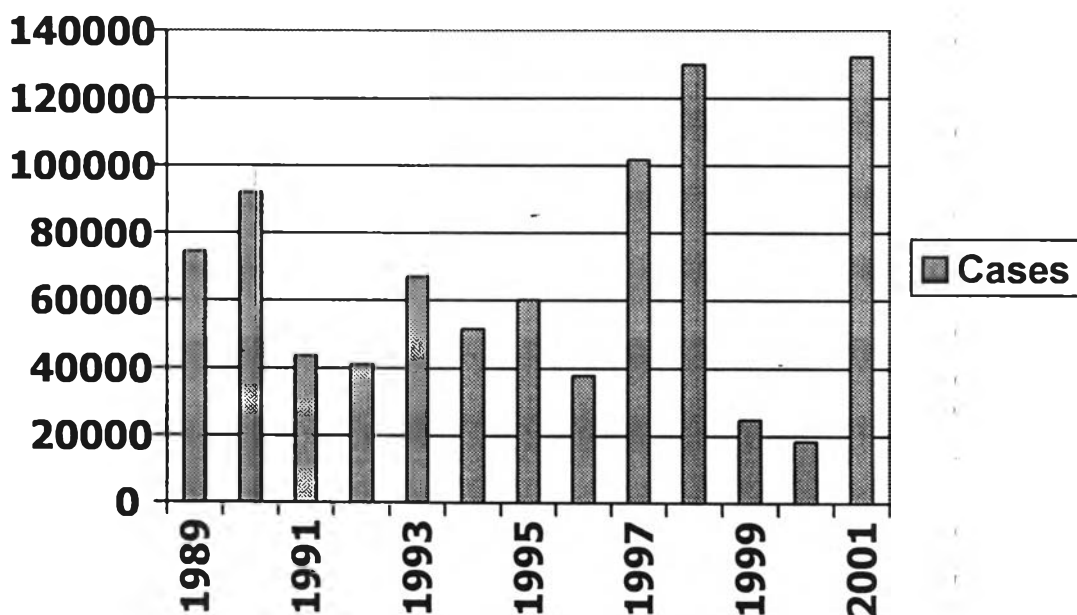


Figure 2.3 shows that in 1999-2000, after the Ministry of Public Health launched the National Dengue Prevention and Control plan (NDPCP) to celebrate His Majesty the King's 72 (sixth cycle) birthday. The dengue Haemorrhagic problem in Thailand has decreased but after the budget allocated for the programme ran out in 2001 the dengue Haemorrhagic problem has increased.

A Planning Department of Prevention and Control Dengue Haemorrhagic Fever 2002, Epidemiological division, MOPH stated the goal for the year 2002 is to decrease DHF morbidity rate to 50 per 100,000 populations. This was a goal in Public Health Development Plan of Thailand in National Economic and Social development 8th plan (1998-2001). The 2002 target set by MOPH is lower than NESD 9<sup>th</sup> (2002-2005)

Master plan which stated a goal to decrease DHF morbidity rate to 20 per 100,000 population and DSS not over 2 cases per year.

Division of Epidemiology, Ministry of public health, Thailand reported that there are 8,712 DHF incidence cases and 16 deaths all over the country, during 1 January – 24 March 2001. The 10 highest DHF incidence rate occurrences are Ratchaburi, Nakorn Prathom, Samutsakorn, Rayong, Nakorn Sawan, Bangkok Samutprakan, Phetburi and Samutsungkram Province, respectively.

Ratchaburi Province would be the endemic area to study and launch intervention program in order to prevent further trend.

**Table 2.4: Morbidity and Mortality rate/ 100,000 population of DHF in Thailand and Ratchaburi Province from 1995 –2001**

Year	THAILAND		RATCHABURI	
	Morbidity	Mortality	Morbidity	Mortality
1995	101.46	0.31	112.47	0.00
1996	63.09	0.19	68.55	0.63
1997	167.21	0.42	253.97	0.25
1998	211.42	0.69	136.79	0.49
1999	40.38	0.09	49.24	0.00
2000	30.19	0.05	167.42	0.37
2001	*14.15 (as of 24 Mar)	*0.03 (as of 24 Mar)	229.33	0.24

Source: Epidemiological Division, MOPH, Thailand

Table 2.4 shows that morbidity and mortality rate of Dengue Haemorrhagic Fever in Ratchaburi when compared with the morbidity and mortality rate of the whole country of Thailand is higher except in 1998. This can be interpreted as, that although the National Dengue Prevention and Control plan (NDPCP) to celebrate His Majesty the King's 72 (sixth cycle) birthday programme was successful, the program was not as successful in Ratchaburi province.

## 2.7 Campaign Key Features

The campaign is a part of the Public Relations field which focuses on changing people's behavior at the final stage. The word Public Relations (PR) is quite wide because it consists of many channels of communications such as advertising, television, radio spots, newspapers and other print media. These examples of the mass media are accessible to most people in the developed world. However, there are many small channels that we normally do not think about and which are highly effective, especially if we want to address our messages to the grass roots level in many of the villages. In many of the poorer villages, most modern forms of communications are not available, and in these instances, word of mouth communication or the grapevine is a highly effective channel. This is a channel of PR that people pass the message from person to another person by chatting. Many activities are useful if we know how to use them.

Health promotion is another step of PR that can influence people in enhancing and changing health behaviour. This is a highly effective tool that can be used in the public health arena. There is a campaign which is mostly used for encouraging people to do something or changing their behaviour. The most powerful campaign that is widely organized and implemented is the Persuasive campaign. It comes from the information campaign which is used in the social work and services field.

Normally, Persuasive campaign is used in political, social and commercial field. The use of persuasive communication messages influences the people or the audience to follow the instructions or the messages of the campaign. For example, in an election campaign, the candidate gives a speech aimed at persuading the people to vote for him or her. This is the same in the health field which is related to social field. Audiences vote

for the person who will help them for better life. In health terms, better life is healthier. The prevention of disease is an approach to make your quality of life better.

Dengue Haemorrhagic Fever can be prevented if people eradicate mosquitoes. In reality however, “eradicate” is an enormous goal to achieve. If every human being helps in getting rid of mosquitoes, we can hope to nearly touch the word eradicate. The best way to approach this target would be to get rid of their larvae.

Persuasive campaign, which means a sustained communication campaign to increase people action in the community, is an activity to reduce *Ae.aegypti* vectors. Persuasive campaign emphasizes on the communication theory which consists of verbal or/and non-verbal communications including the passing of the message to the audience and amount of message that they can receive. Therefore, the message (content of the message) is an important part to develop in the Persuasive communication campaign.

There are five Persuasive communications designs that Otto Lerbinger’s describes:

(1) Stimulus-response is the simplest design in which two things are seen together many times: people will think of one of them when they have seen another. It works well with animals like dogs. Before the dog gets food the bell will ring first every time, so the dog will start drooling every time when the bell ring.

(2) Cognitive is the design that people will reach the right conclusions if given the right information in a logical, understandable way. People will agree with you when you provide reasonable information, in the other words if other things being equal.

(3) Motivation is the design of giving some emotional reward for accepting communication. The kind of emotional reward human needs so the message that was written has to identify the relevant needs of audience.



(4) Social is the design that concerns with social class and group norms. The members or group are influencing in individual decision when he/she belong to that group.

(5) Personality is the design that cannot be used effectively. Actually the persuasive message is frequently directed to a large group with many personalities. However, it will work well in a specific group.

Persuasion is an emotional process. The message itself has to be persuasive by using some theory and the basic effective theory is Maslow Theory of needs. People always think about their needs in their life. The message will affect the audience's emotion or needs and only then would they follow what the message tells.

People graduates from each hierarchical needs to the next. The basic needs is at the bottom of the hierarch and after the people get their basic needs in their life such as food, water, shelter etc., their needs expand and focus safety after that which on safety issues.

Safety means that only they have water to drink and use in their lives but they needs safe water for better health. Safety also includes freedom from danger to their personnel security and health.

Social needs is a sense of community self-reliance, they are doing things together for the common good. The social needs fit the strategy in wanting community to take charge of intervention. People have to help themselves in reducing vectors; It means the campaign has to enhance empowerment and self-reliant to the community.

**Figure 2.4:** Maslow theory of human needs



People have different kinds of needs, ranging from the most basic, physical needs (like food, water and sleep) to sophisticated needs for self-actualization, such as achieving personal fulfillment. (Dong Newsom & Tom Siegfried, 1981)

There are many factors reflecting the campaigns. Channel and time are the points to consider because they are the benefits that audience will receive. Can audience listen or read it easily?

Time means the audience time. This survey has to be done before setting a timetable to launch the message because the messages will not be affected, if the target audiences are not available. For example, the prime time of public announcement in a small community is 5.30-7.00 before people go to work

Either in public health field or in a campaign, it is most important to put the right thing in the right place. If the message in the campaign is persuasive, but the place that receive the campaign has low Dengue Haemorrhagic Fever incidence rate and larval

infestation is rare, there would be no effectiveness of the campaign and would not address the public health issue/concern of the audience.

As mentioned before, changing behaviour is a very difficult activity. The public health field is mainly concerned about people's lifestyles. The combination of effective communication and public health activities can contribute to help people to better prevent themselves from any diseases which might affect the well-being of the people.

In the recent year, new dengue virus strains and serotypes will likely continue to be introduced into the area where the population densities for *Ae.aegypti* are at high levels. *Ae.aegypti* also adapts to live in any environment which makes the classic dengue virus develop.

The public health authorities have to emphasize disease prevention and mosquito control through community efforts to reduce larval breeding sources. A public information campaign is an activity that can be instituted. With stressing the basic epidemiological characteristics of dengue and DHF and the measures the individual can take to reduce the risk of infection.

The source reduction efforts at home and in the neighborhood are the main issue. Solid Waste Disposal is another primary of mosquito breeding sites. The plethora of unusable containers is discarded by the population. These containers have been the target of massive clean-up campaigns by all dengue programs.

The role of the government is to mobilize residents of affected area and start clean-up campaign. There are many campaigns created for reducing *Ae.aegypti* purpose. Some are effectiveness and some are not, the different outcomes of the campaigns depend upon the appropriate campaign that use in the suitable environment and/or the

background of people that able to accept the campaign. The following are three campaign examples in The Philippines, Singapore and Cambodia.

### **(1) The Philippines:**

During 1996, a severe epidemic was recorded in the Metro Manila area with a morbidity rate of 28/100,000 and mortality rate of 0.7/100,000. Dengue becomes endemic all over the country.

The collaboration between government and NGOs had lunched “4 o’clock habit” campaigns whereby every 4 o’clock in the afternoon, everyone has to search and destroy or eliminate breeding places of mosquitoes in homes, offices and the environment. This 4 o’clock habit can be practiced at one’s own convenience of necessary.

These campaigns more often boost the popularity of local politicians rather than sustainable changes in people’s habits. They do not take account that most Filipinos are poor and have to live in circumstance where any “four o’clock habit” is futile and reflects insensitivity to the people’s miserable living conditions.

### **(2) Singapore**

There slogan “Collective action today to ensure Singapore’s long-term environmental sustainability.”

The public Education Department (PED) was set up in 1992, to spearhead efforts in public health issues. The primary function of the department was to facilitate awareness as a resource and educational institutions, green groups, grassroots

organizations, Non-governmental Organization (NGOs), the public and private sectors, through community programmes and projects.

The objective of Dengue Haemorrhagic Fever project is to raise awareness of DF/DHF, its dangers, and the important role both the community and the individual play in its prevention.

The success of the programme is the collaboration between health and environment Organizations in Singapore. The promoting of good environment can help to solve health problems such as Dengue Haemorrhagic fever.

An interactive CD-Rom "Our Environment We Care" developed for primary school students addresses key environmental issues like nature appreciation, DF/DHF and cleans public toilets. The topics complement the school science and health education syllabi to help students understand how intimately the environment affects them.

### **(3) Cambodia:**

Within nearly one month since 16 May, 2001 more than 100 cases of DHF had been recorded in children in Pursat Province with a fatality rate of approximately 12% "This is an unacceptably high fatality rate." said Neil Hawkins, CARE country director in Cambodia." With proper management, the case fatality has decreased approximately 1 percent."

The rapid response was carried out in collaboration with Pursat Province department of health operate the public health education campaign. The use of larvacide against the *Aedes aegypti* mosquito, which lay eggs mainly in water jars is the major preventive instrument against DHF outbreaks.

The campaign used loudspeaker and TV message, leaflets, posters, and one-to-one education to spread the message about the outbreak and help contain its spread.

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