FACTORS RELATED TO PREVENTIVE BEHAVIOUR AGAINST DENGUE HEMORRHAGIC FEVER AMONG MIGRANTS IN MUANG DISTRICT, SAMUT SAKHON PROVINCE, THAILAND

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ABSTRACT

This cross sectional study was conducted on factors related to preventive behaviour against dengue hemorrhagic fever (DHF) among migrants in Muang district, Samut Sakhon province, Thailand. A total of 176 migrant workers ranging from 15 to 50 years old were interviewed using a structured questionnaire from the community in Muang district from February 5-8, 2007. Descriptive statistics and Chi-square test were applied to show the frequency of variables and the association between independent and dependent variables. The aims were to identify demographic variables, knowledge, perception and cues to action as the factors related to preventive behaviour against DHF among migrants, and explore the association between these factors and preventive behaviour.

The results of the study revealed that 43.18 percent of respondents took a moderate level of preventive behaviour against DHF, and 42.61 percent of them had a high level of preventive measures. 71.02 percent had poor knowledge, but had high perception toward DHF, at 64.77 percent. Furthermore, they mostly received the information about this disease from health volunteers, announcements and TV, 65.91, 60.80, 52.27 percent, respectively. Covering water containers was the most common preventive measure. The findings also showed that there was a significant correlation between duration of stay, advice from doctors or family members, experience from dengue patients associated with the respondent and receiving information from TV, and preventive behaviour against DHF (P-Value< 0.05).

This study indicates that attention is especially needed on the migrants who stay long term in Muang District, Samut Sakhon, to improve precautionary measures against DHF. Furthermore, the information tools for migrants, such as TV and doctors, should be strengthened. Health volunteers should also act as powerful encouragement to migrants to take countermeasures against DHF.

KEY WORDS: PREVENTIVE BEHAVIOUR/DENGUE HEMORRHAGIC FEVER/ MIGRANTS

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LIST OF ABBREVIATIONS

DF	**:**	Dengue Fever
DHF	**:**	Dengue Hemorrhagic Fever
DSS	**:**	Dengue Shock Syndrome
Ae.	**:**	Aedes
ADE	**:**	antibody-dependent enhancement
PDVI	**:**	Pediatric Dengue Vaccine Initiative
WHO	**:**	World Health Organization
HBM	**:**	Health Belief Model
KAP	**:**	Knowledge Attitude and Practice
DEET	**:**	N, N-Diethyl-m-Toluamide
ITMN	**:**	insecticide-treated mosquito nets
Bt.	**:**	Bacillus thuringiensis
Bs	**:**	Bacillus sphaericus
IGRs	**:**	Insect growth regulators
ULV	**:**	Ultra-low volume
DALYs	**:**	disability-adjusted life years

CHAPTER 1
INTRODUCTION

1.1 Rational and Justification

Dengue Fever (DF) is nowadays one of the most rapidly expanding diseases of the tropics. WHO estimates that 50 to 100 million cases of DF occur worldwide every year, and about two fifths of the world's population are now threatened by dengue. Remarkable recent dengue outbreaks have occurred in five of six WHO regions such as Washington, Cairo, Brazzaville, Manila and Delhi. A significant number of imported dengue cases however has been reported from several countries in European region as in Figure1. Not only the people who live mainly in urban areas in tropical and subtropical regions are at risk of infection, but also in rural areas in South East Asia.

Dengue virus causes morbidity and mortality by Dengue Hemorrhagic Fever (DHF) and Dengue Shock Syndrome (DSS) in the tropical region. Four serotypes of virus have been reported, such as DEN-1, DEN-2 DEN-3 and DEN-4, and they have been found in all tropical regions. For example, three serotypes have circulated in Northern Queensland, Australia, two serotypes in the Middle East and four serotypes in South East Asia. There has been a dramatic global increase in the frequency and epidemics of DF, DHF, and DSS over the last two decades. Before 1970, only nine countries had experienced DHF epidemics, a number that has been increasing rapidly for 25 years. Besides that, epidemics of DHF is said to be cyclical. The disease is now endemic in more than 100 countries, 20 countries in Africa, 42 in the Americas, 4 in the Eastern Mediterranean, 7 in South East Asia and 29 in the Western Pacific. South East Asia and the Western Pacific are most seriously affected as in Figure 1. [1]

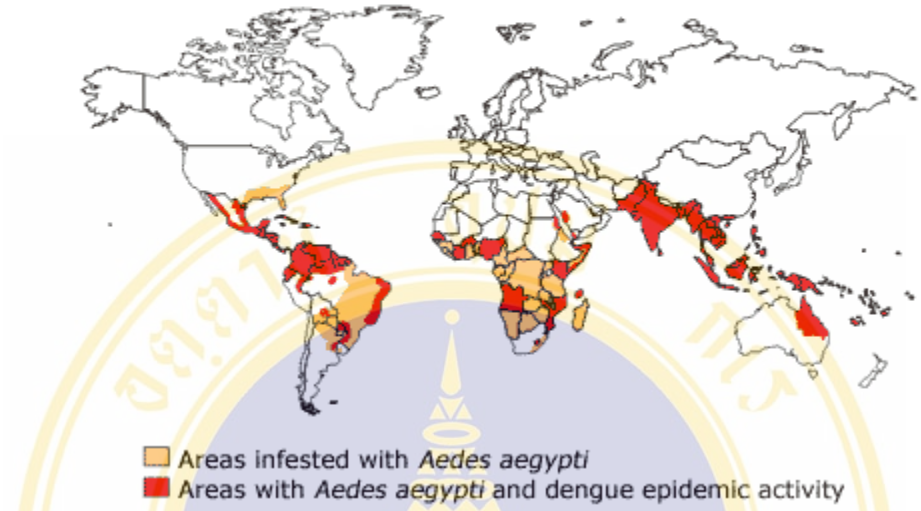


Figure 1 World Distribution of Dengue Viruses and Their Mosquito Vector, *Aedes aegypti*, in 2003 [2]

DHF causes hospitalization and death. The WHO estimates that there are 25,000 deaths per year, and 500,000 DHF cases per year need hospitalization. 90 percent of the patients are children who are less than 15 years old. At least 2.5% of those cases are fatal, and case fatality of DHF could be twice as high. With proper treatment, the mortality rate of dengue would be fewer than 1 out of 10,000. In contrast, if DHF patients do not receive proper and modern intensive treatment, the DHF case fatality rates might exceed 20 percent. [3]

Seven out of ten countries in South East Asia have a serious DHF problem. The number of DHF cases has increased over the last three to five years, with recurring epidemics, and the number of reported cases and case fatality rate of DF/DHF in this region was shown in Figure 2. The incidence of DHF in this region has increased dramatically in the past 17 years, and the number of the reported case is approximately five times higher than over last 30 years. Recently, major epidemics of dengue cases were in India, Sri Lanka, Thailand, Myanmar and Indonesia. There has particularly been an increased proportion of severe dengue cases in India, Sri Lanka and Myanmar. Furthermore, the geographic distribution has expanded within the countries as well as to new countries in the region.

South East Asia region can be stratified into four categories by level of hyperendemic of DF/ DHF as follows. [1]

- Category A includes Indonesia, Myanmar and Thailand. DF/ DHF is a major public health concern in these countries. Multiple virus serotypes circulate in these regions, and *Aedes aegypti* is the principal epidemic vector. The role of *Aedes albopictus* however is uncertain. There are cyclical epidemics in urban centers with three to five years periodicity. Furthermore, it has spread to rural areas as well.
- Category B includes Bangladesh, India, Maldives and Sri Lanka. DHF is an emergent disease in these countries, and cyclical epidemics are becoming more frequent. Multiple virus serotypes circulate in these regions, and *Aedes aegypti* is the principal epidemic vector. The role of *Aedes albopictus* however is uncertain. Furthermore, DF/ DHF is expanding geographically within the countries.
- Category C includes Bhutan and Nepal, there is no reported case of DF/ DHF, and endemicity is also uncertain.
- DPR Korea has been categorized in category D, but there is non endemic DF/ DHF in this country.

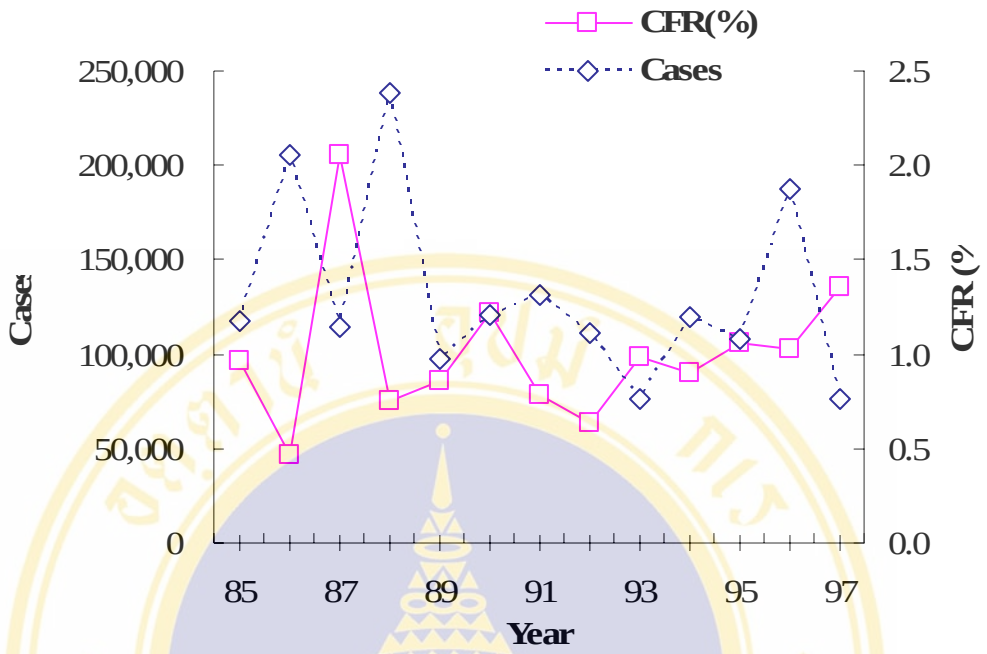


Figure 2 The Number of Reported Cases and Case Fatality Rate of DF/DHF in the South East Asia Region, 1985-1997 [1]

DHF has been a major public health problem in Thailand over the past 30 years. It is without a declining tendency of the incidence and mortality rate. There was a rising trend with an epidemic occurrence every two years in 1997, 1998, 2001 and 2002 as in Figure 3. However, the DHF case-fatality rate has been declining as in Figure 4.

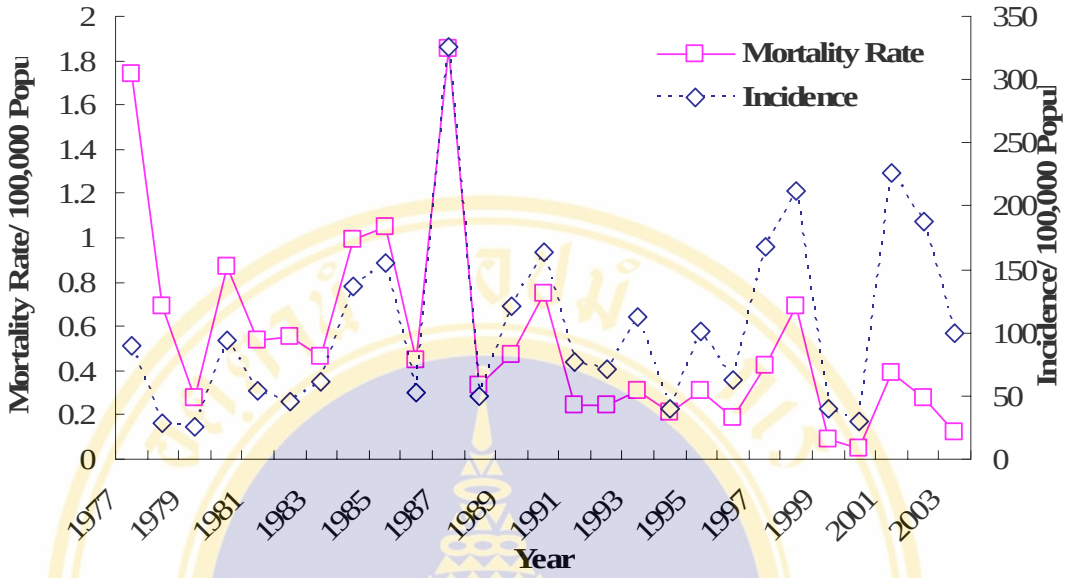


Figure 3 Incidence and Mortality Rates of DHF, Thailand, 1977-2003 [4]

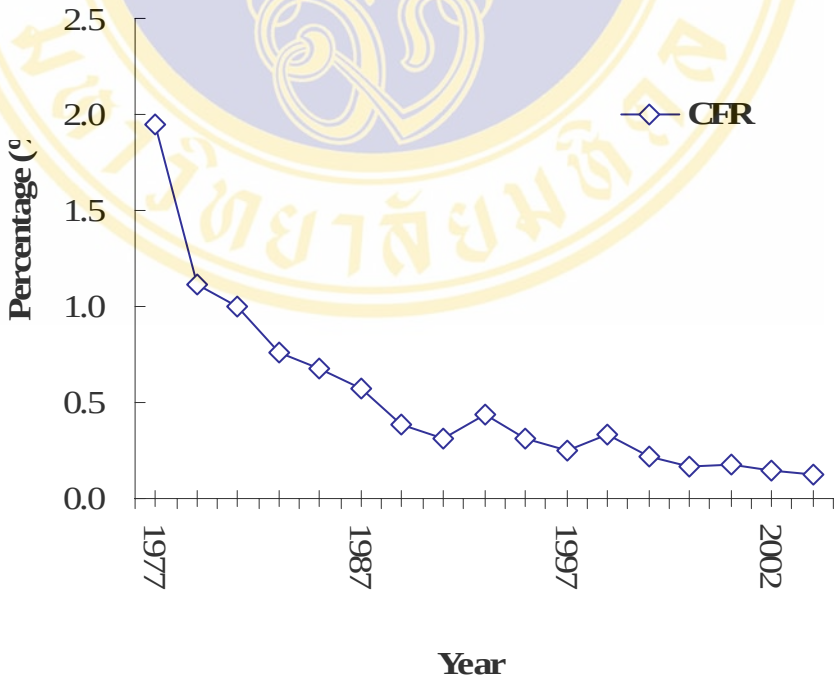


Figure 4 Case-Fatality Rate of DHF in Thailand, 1977-2003 [4]

According to the report of WHO [5], a total of 38,367 cases including 48 fatal cases were reported in Thailand in 2004, and the Ministry of Public Health in Thailand reported [6] that there were 45,893 dengue cases including 71 fatal cases in 2005. By October in 2006, a total of 36,372 cases including 34 fatal cases were reported. [7]

Thailand aims to reduce DHF by 20 percent in 2007. [8] To achieve this goal, a strategy to control dengue was developed. The main component of it is to train personnel and recommend using chemical spray, conduct susceptibility tests and study about the life cycle of the mosquito in each area to prevent DHF.

DHF is epidemic in every area of Thailand as in Figure5. Figure 6 shows that there were high cumulative DHF cases in the central part of Thailand. Kamphaeng Phet, Nakhon Sawan, Phichit and Uthai Thani were declared red zones of DF due to the high number of the cases reported on July 2006. [9]

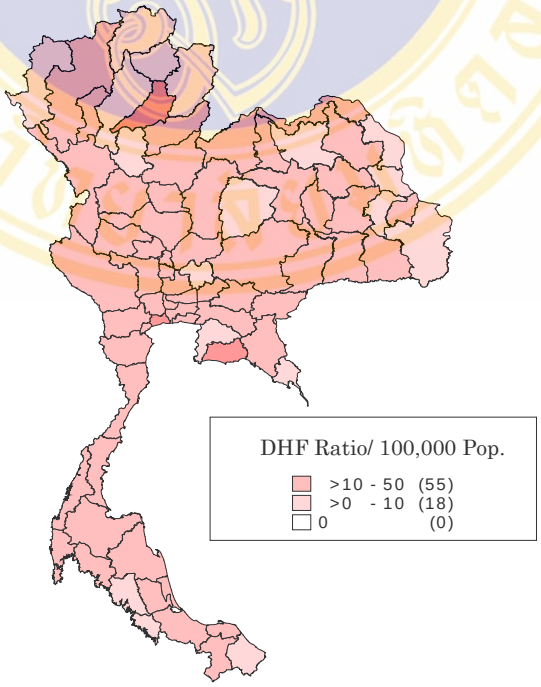


Figure 5 DHF Ratio per 100,000 Population, 1 January- 4 July in 2006 [10]

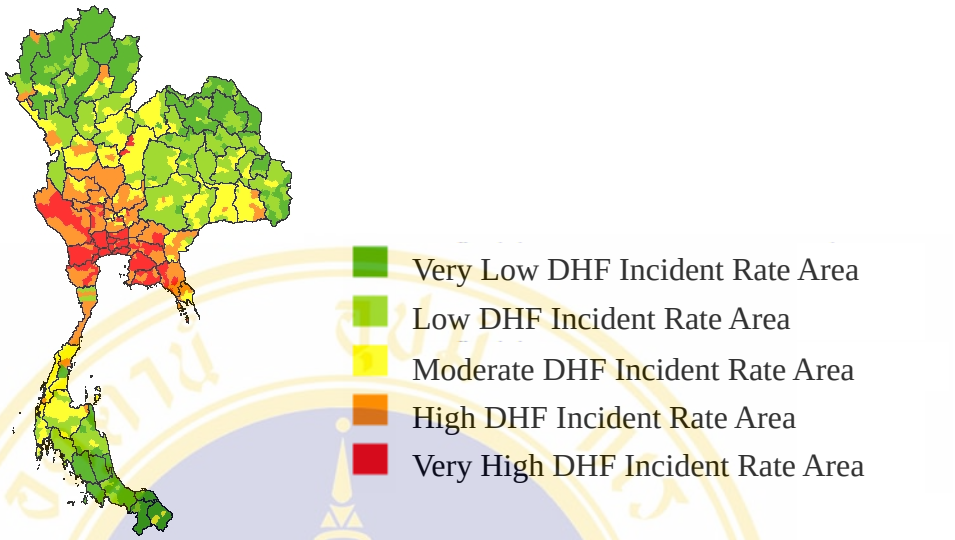


Figure 6 Cumulative DHF Cases from 25th June to 1st July in 2006 [10]

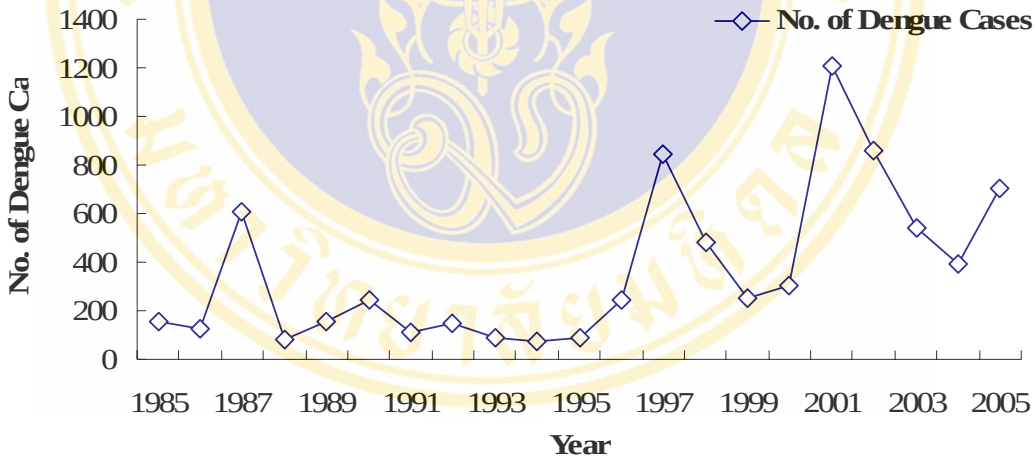


Figure 7 Number of Dengue Cases in Samut Sakhon 1985-2005

Samut Sakhon is a province in central Thailand. The report from the Ministry of Public Health in Thailand showed that there was 1 death due to dengue in 2003 and again in 2004 in this province. [11, 12] Figure 7 shows the prevalence of dengue cases in this province from 1985 to 2005, with peaks in 1987, 1997 and 2001. [13] Dengue's recurring year is every four years in Samut Sakhon. The year 2006 was correspondent to this dengue epidemical year. Therefore, the provincial health office in Samut Sakhon provided intensive prevention campaign of DHF for the

habitants, and intensive treatment was provided for high DHF prevalence areas in this province. There were 557 dengue cases from January to October in 2006 in Samut Sakhon. [7] The case rate per 100,000 population by 4 November 2006 was 74.55. [14] The morbidity rate per 100,000 population was 123.23 in 2006. [15] The following line graph shows a transition of dengue cases in Samut Sakhon from January to October in 2006. [7] There was a peak of the number of dengue cases in Samut Sakhon in 2006 on January and August, while it was remarkably low in May and October.

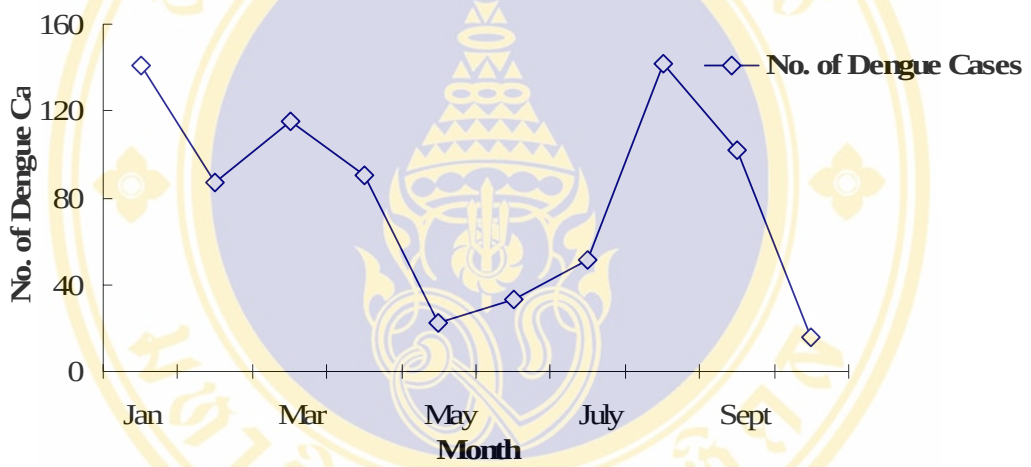


Figure 8 Number of Reported Dengue Cases in 2006 in Samut Sakhon (January-October)

Table 1 showes the annual number of DHF patients in Muang District, Samut Sakhon by occupation and gender in 2006. [13] More than half of DHF patients were students, and 33.75 percent of DHF patients were labours.

Table 1 The Annual Data of DHF Patients in Muang District, Samut Sakhon by Occupation and Gender in 2006

Occupation/Gender	Male	Female	Total	%
Farmer	2	0	2	0.83
Civil Servant	0	1	1	0.42
Labour	44	37	81	33.75
Merchant	0	2	2	0.83
House Work	2	8	10	4.17
Student	69	60	129	53.75
Fishing	0	0	0	0
Other	12	3	15	6.25
Total	129	111	240	100

Table 2 The Annual Data of the DHF Patients in Muang District, Samut Sakhon by Age and Gender in 2006

Age/ Gender	Male	Female	Total	Rate of Illness	Total Population
< 1	5	1	6	220.83	2717
1-4	4	4	8	64.57	12389
0-4	9	5	14	92.68	15106
5-9	19	16	35	189.61	18459
10-14	35	29	64	351.4	18213
15-24	39	36	75	203.89	36785
25-34	14	18	32	79.04	40485
35-44	9	7	16	40.07	39930
45-54	4	0	4	15.28	26183
55-64	0	0	0	0	13681
>65	0	0	0	0	13905
Total	129	111	240	107.75	222747

Table 2 shows the annual data of the DHF patients in Muang District, Samut Sakhon by age and gender in 2006. [13] There are remarkable peaks in the number of DHF patients under 1 year old, and between 5 and 24 years old.

Samut Sakhon has a large proportion of migrants in this province. The report in 2003 showed that 19.4 percent of the population in this province was migrants [16]. The following table showed the number of dengue cases from 2004 to 2006 classified into nationality. [17-19] Around 4 percent of DF patient were migrants, and approximately 6 percent of migrants got DHF.

Table 3 Number of Dengue Cases in Samut Sakhon by Nationality (2004-2006)

Year	Total	Thai	Migrants	Fatal Case
2004	**462**	**437**	**25**	**(Thai: 1)**
2005	**1265**	**1192**	**73**	
2006	**557**	**531**	**26**	

1.2 Importance of Primary Health Care

DHF are often, though not exclusively, associated with poor environmental sanitation, inferior housing and inadequate water supplies. Where such conditions prevail, communities need to be instructed in what steps they can take to prevent and control the disease. The diagnosis and management of DHF, as well as the control of outbreaks, may be a problem that can be addressed by primary health care workers. The disease tends to spread from large cities to smaller ones and to villages infested by vector mosquitoes. Transmission of the disease can be reduced by community participation in vector control. In addition, the case fatality rate of DHF can be considerably decreased if appropriate fluid replacement therapy is given early in the course of the disease. Referral to a well equipped hospital is not always possible; therefore, health care workers, particularly in rural areas, should be instructed in the early diagnosis and effective management of patients suspected of having DHF. [20]

1.3 Research Question

What are the factors affecting preventive behaviour against DHF among migrants in Muang District, Samut Sakhon?

1.4 Research Objectives

1.4.1 General Objectives

To find out the preventive behaviour of migrants against DHF in Muang District, Samut Sakhon and identify the factors related to preventive behaviour against DHF among migrants.

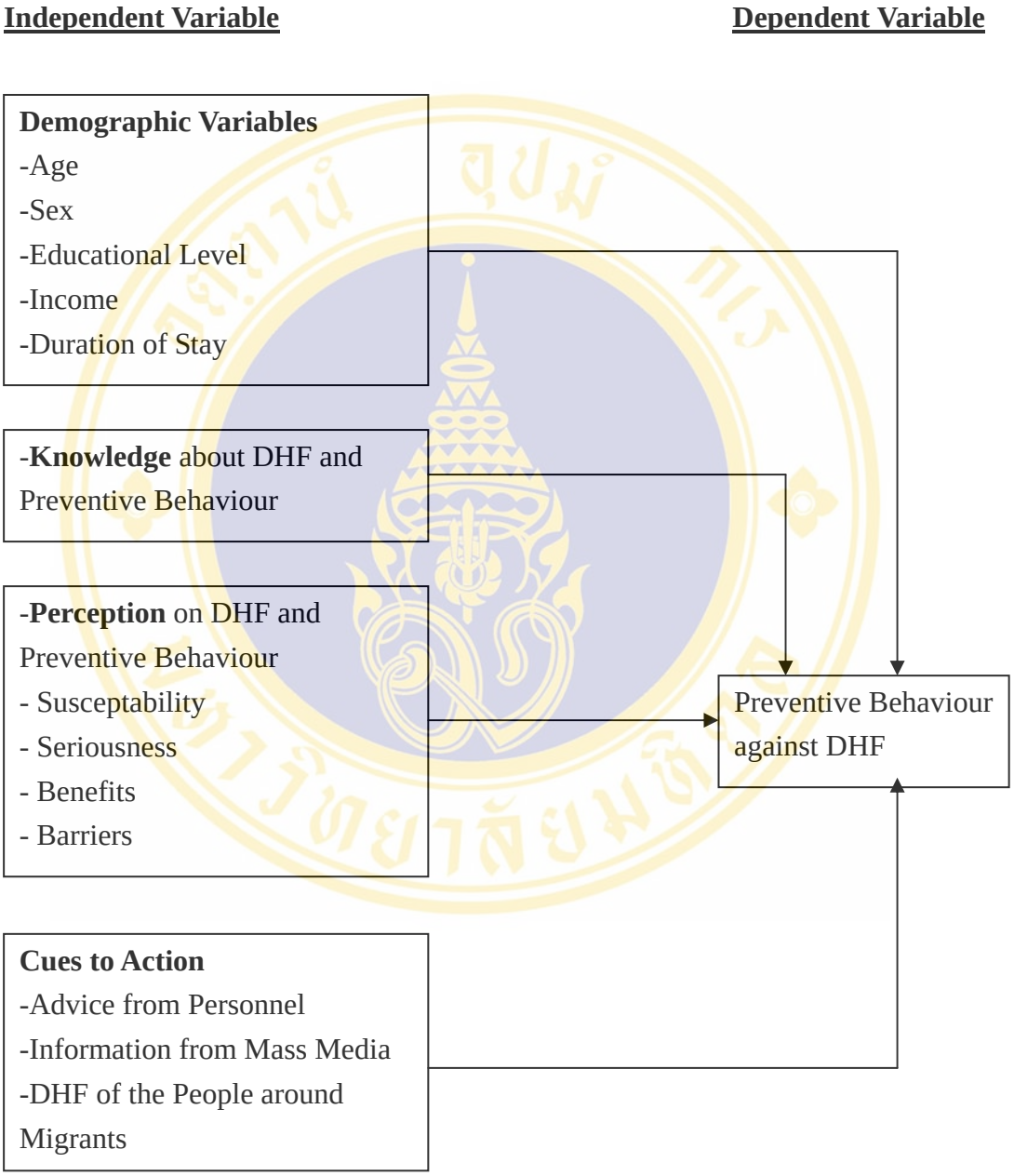
1.4.2 Specific Objectives

1. To identify the preventive behaviour against DHF among migrants in Muang District, Samut Sakhon.

2. To identify the demographic variables, knowledge, perception about preventive behaviour and cues to action against DHF among migrants in Muang District, Samut Sakhon.

3. To describe the association between the demographic variables, knowledge, perception about preventive behaviour and cues to action, and preventive behaviour against DHF among migrants in Muang District, Samut Sakhon.

1.5 Conceptual Framework (Health Belief Model)



1.6 Operational Definition

Migrants: The people who work in Muang District, Samut Sakhon aged 15 to 50 years old. They move from foreign countries to Muang District, Samut Sakhon in central Thailand.

Demographic variables

Age: In this study refer to the age of migrants.

SEX: Defined as gender of migrants.

Education level: Defined as the highest level of study of migrants.

Income: Refers to the total income of migrants per month.

Duration of stay: Defined as the time that the migrant stays in Samut Sakhon for working.

Knowledge about DHF and preventive behaviour: The knowledge of migrant workers about the cause (transmission, environment), symptom, treatment, preventive method of DHF.

Perception on DHF and preventive behaviour: The realization that results in action for prevention against DHF among migrants. The perception is composed from susceptibility, seriousness, benefits and barriers.

Cues to action

Advice from personnel: The advice to migrants about DHF from doctors, nurses, health volunteers, family members, relatives and friends in Muang District, Samut Sakhon.

Information from mass media: From which mass media, TV, radio, newspaper, brochure, leaflet or announcement, have the migrants get the information about DHF.

DHF of the people around migrants: Whether the family members, relatives or friends of the migrants have had DHF before.

Preventive behaviour among migrants against DHF: Use of mosquito net, repellent, remove water containers, biological larvicide (fish)

1.7 Limitation of the Study

The data is collected by stratified sampling. It does not cover all the migrants in the study area therefore the result might not generalize the information of all the migrants. In addition, migrants generally back away from contacting external people and there is a language barrier. Thus, it is difficult to communicate with them directly for data collection, and the study has been conducted in limited of time.

CHAPTER 2
LITERATURE REVIEW

2.1 Dengue and Dengue Hemorrhagic Fever

Dengue virus infection may be asymptomatic or may cause undifferentiated febrile illness (viral syndrome), DF, or DHF including DSS as seen in Figure 9.

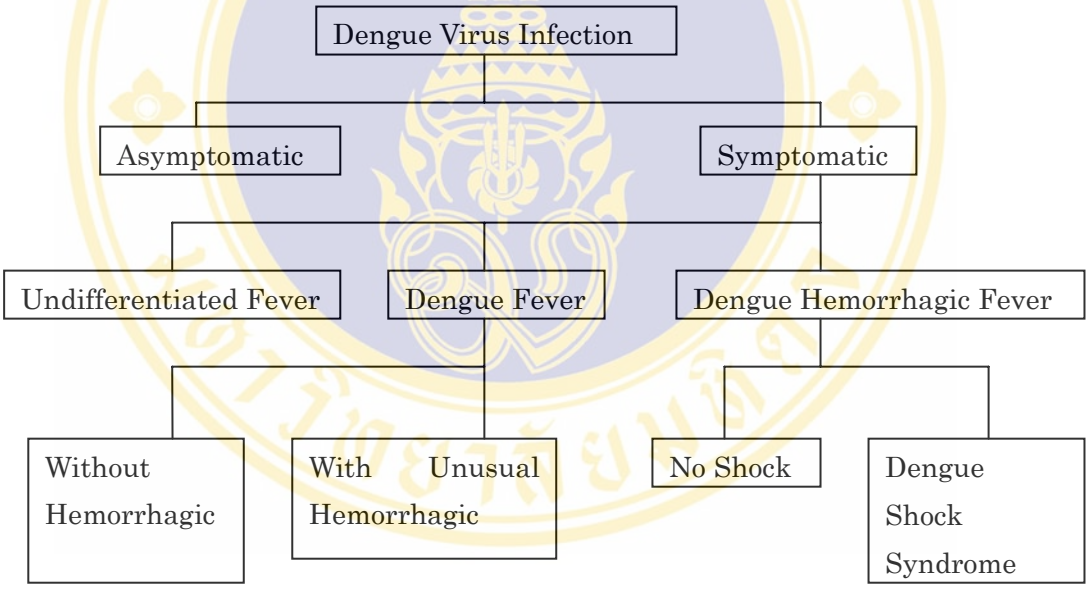


Figure 9 Manifestation of Dengue Infection [1]

DF is most common in older children and adults. It is generally an acute biphasic fever with headache, myalgias, arthralgias, rashes and leucopenia. Basically, patients recover naturally from most cases of DF. DF seldom occurs among indigenous people in dengue endemic areas.

DHF is most common among children who are less than 15 years old, but it also occurs among adults. DHF is characterized by the acute onset of fever and

associated non-specific constitutional signs and symptoms. There may be hemorrhagic diathesis and a tendency to develop DSS. The case fatality rate is high if patients take on symptoms of DSS. Abnormal haemostasis and plasma leakage are the main pathophysiological changes, with thrombocytopenia and haemoconcentration presenting as constant findings. Although DHF commonly occurs among children who have experienced secondary dengue infection, it has been reported in primary infections as well. [1]

2.1.1 Grading the Severity of Dengue Infection

The severity of dengue infection is classified into the 4 grades in table 4. [21]

Table 4 The Classification for Severity of Dengue Virus Infection

DF/DHF	Type	Symptoms
DF		Fever with two or more of the following signs: headache, retro-orbital pain, myalgia, arthralgia
DHF	I	The above manifestations and hemorrhagic manifestation
DHF	II	The above manifestations and spontaneous bleeding
DHF	III	The above manifestations and signs of circulatory failure (weak pulse, hypotension, restlessness)
DHF	IV	Profound shock (undetectable pulse and blood pressure)

DHF Grade III and IV are also called DSS.

2.1.2 Transmission of Dengue Viruses

Dengue viruses are transmitted to humans by infected Aedes (Ae.) mosquito bites, principally *Ae. aegypti* which is considered to carry arboviruses (arthropod-borne viruses). Once infected, the mosquito remains infected for life. It

transmits the virus to susceptible individuals during probing and feeding. Infected female mosquitoes may also pass the virus to the next generation of mosquitoes by transovarian transmission, but it rarely occurs and probably does not contribute significantly to human transmission. Humans are the main amplifying host of the virus. The virus circulates in the blood of infected humans at approximately the time when the infected person has fever, and uninfected mosquitoes may acquire the virus if they feed on the individual who is viraemic. The virus then develops in the mosquito for a period of eight to ten days, before it can be transmitted to other humans during subsequent probing or feeding. The length of time required for this extrinsic incubation depends on environmental conditions, especially ambient temperature. [20] Figure 10 shows the transmission of dengue virus.

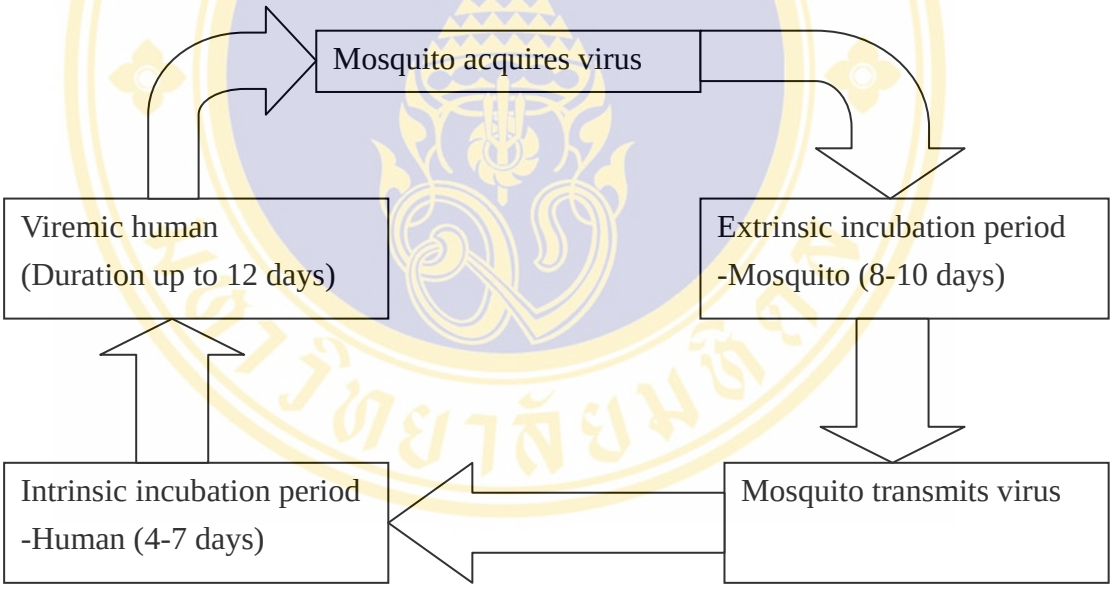


Figure 10 The Transmission of Dengue Virus [21]

2.1.3 The Virus

DF is an acute febrile disease in tropical areas. Four types of the dengue virus which are DEN-1, DEN-2, DEN-3 and DEN-4 have been discovered. These dengue viruses form a distinct complex within the genus Flavivirus based on antigenic and biological characteristics. Each virus confers lifelong immunity to the virus serotype. [1] According to S.B.Halstead in the 1970s [22], DHF is more likely to happen to patients who have been infected by different types of the virus before.

This is known as antibody-dependent enhancement (ADE), as these four types of the dengue virus are closely related. When the patient recovers from his primary infection which provides lifelong immunity, the immunization does only mean a partial and transient protection against subsequent infection by any of the other three remaining viruses. [22] All types of dengue virus are associated with epidemics of DF and DHF, and these also cause DHF epidemics. [1] Significant outbreaks of DF tend to occur every five to six years. [22]

2.1.4 The Vector

DF is transmitted by mosquitoes. *Ae. aegypti* is the most important epidemic vector, because *Ae. aegypti* is highly anthropophilic and thrives in close proximity to humans and often lives indoors. However, the other species such as *Ae. albopictus, Ae. polynesiensis,* several species of the *Ae. scutellaris* complex and so on have also been incriminated as secondary vectors, and these have attributed to dengue outbreaks as well. There is however restricted geographical distribution for these vectors except *Ae. aegypti,* and they may be excellent hosts for dengue viruses. However, these are generally less efficient for dengue epidemic than *Ae. aegypti*. A factor complicating eradication of the vector is that the eggs of *Ae. aegypti* can withstand long periods of desiccation, sometimes for more than one year. [1, 20]

Figure 11 *Aedes aegypti* mosquito [21]

Figure 12 *Aedes albopictus* mosquito [21]

2.1.5 The Host

Dengue virus infects humans and several species of lower primates. Humans are the main urban reservoir of the viruses. Dengue virus strains grow well in insect tissue cultures and on mammalian cell cultures after adaptation. [1]

In humans, each of the four dengue virus serotypes has been associated with DF and DHF. DSS occurs with higher frequency in two immunologically-defined groups. One of them is children who have experienced a previous dengue infection, and the other group is infants with waning levels of maternal dengue antibody. The acute phase of infection, following an incubation of 3-14 days, lasts about 5-7 days and is followed by an immune response. The first infection produces life-long immunity to the infecting serotype, but temporary and partial protection against the other three serotypes. The secondary or sequential infections are possible after a short time. Transmission of dengue virus from infected humans to feeding mosquitoes is determined by the magnitude and duration of viraemia in the human host. Persons with high viraemia provide a higher infectious dose of virus to the feeding mosquito. Normally, this leads to a greater percentage of feeding mosquitoes become infected, though even very low levels of virus in blood may be infectious to some vector mosquitoes. [20]

2.1.6 Prevalence of Dengue Hemorrhagic Fever

The disease was identified and named in 1779. The first epidemics of dengue occurred at the same time in the 1780s in Asia, Africa and North America. A

global pandemic began in South East Asia in the 1950s and DHF caused many deaths among children in these regions by 1975. This infectious disease was endemic between the 1980s and the late 1990s. After malaria, DF is the most important infectious disease transferred by mosquitoes. There are around 40 million cases of DF and several hundred thousand cases of DHF globally per year. [22] During epidemics of DF, the attack rate among the susceptible population is often said to be 40-50 percent, but it can practically reach 80-90 percent. [3]

According to the Ministry of Public Health in Thailand, there were 36,997 dengue cases and 49 fatal cases in Thailand by November 4, 2006. The prevalence rate per 100,000 population is 59.27 and case fatality rate is 0.13 percent. [14]

The following is data on reported dengue cases by age group in Samut Sakhon from 2003 to 2006. [23-26] There were many patients aged 10 to 14 years old and 15 to 24 years old in this area.

Table 5 Cases of Dengue by Age Group in Samut Sakhon, 2003-2006

Year	2003	2004	2005	2006
Total	638	462	901	557
<28 days	0	0	0	0
<1 year	3	2	5	8
1+	2	3	5	4
2 +	4	5	7	2
3 +	9	7	10	0
4 +	14	7	14	8
5 +	21	6	13	9
6 +	18	6	20	18
7-9	83	55	104	51
10-14	158	92	201	128
15-24	195	161	277	194

Table 5 Cases of Dengue by Age Group in Samut Sakhon, 2003-2006 (Cont.)

Year	2003	2004	2005	2006
25-34	75	68	156	81
35-44	42	33	56	33
45-54	13	9	21	13
55-64	1	6	12	5
65+	0	2	0	3

According to Ministry of Public Health in Thailand, the proportion male to female DHF cases in Samut Sakhon was almost the same in 2005 and 2006. The following graph is data from 2006. [27]

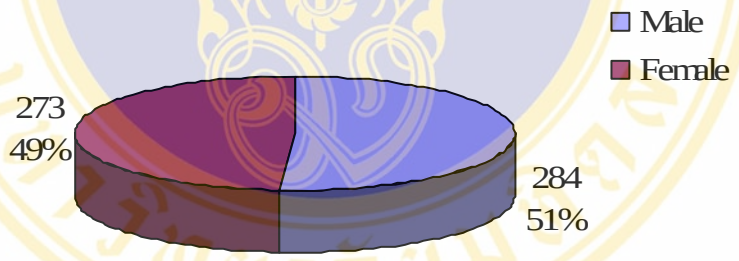


Figure 13 Reported DHF Cases by Gender in Samut Sakhon in 2006

2.1.7 Treatment

There are no specific drugs for its treatment. The supportive therapy is therefore the mainstay of treatment. The patient is encouraged to keep up oral intake, especially oral fluids. If the patient is not able to maintain oral intake, supplementation with intravenous fluids may be necessary to prevent dehydration and significant hemoconcentration. A platelet transfusion is rarely indicated when the platelet level drops significantly, or there is significant bleeding. [22]

There is no vaccination against DF at the moment. It is difficult to develop the vaccine for this infectious disease because each dengue virus is unique and closely related. Only one or two dengue viruses could actually increase the risk of DHF. The sequential infection may cause a shock reaction due to antibody-dependent enhancement (ADE).

The PDVI (Pediatric Dengue Vaccine Initiative) is still on its way to developing protection against all four dengue viruses. It was set up in 2003, and is affordable and accessible for poor children in endemic countries. The project to develop a DHF vaccine started in 1980 at the WHO Collaborating Centre for Research on Immunopathology of DHF at Mahidol University in Thailand. This project was undertaken by scientists of Mahidol University, and supported by the Thai government, WHO, the governments of Australia, Italy and Rockefeller Foundation. [28] This project achieved phase III testing, and planned to test a DF vaccine on 3,000 to 5,000 human volunteers over the next two years after the test of animals and a small group of human volunteers could be successfully conducted.[22]

2.1.8 Prevention Against Dengue Hemorrhagic Fever

The primary method to prevent dengue and DHF are mainly to combat the vector mosquitoes at the present. There are four main methods to prevent DF, such as environmental management, personal protection, biological control and chemical control. They are safe, cost-effective and environmentally acceptable. [1]

2.1.8.1 Environmental Management

Environmental management can be categorized into environmental modification and environmental manipulation. This prevents or minimizes vector breeding and reduces human-vector contact.

Environmental modification includes improving water supply. Where people use an inadequate piped water supply and it is available only in a limited time or with low pressure, they are encouraged to use the storage of water in varied types of containers. This causes an increase in Ae. breeding. It is essential that potable

water supplies be delivered in sufficient quantity, quality and consistency to reduce the necessity and use of water storage containers that serve as the most productive larval habitats. Furthermore, mosquito-proofing of overhead tanks/ cisterns or underground reservoirs also needs to be considered. The structures which are *Ae. aegypti* larval habitats, such as overhead tanks/ cisterns and masonry chambers of piped waterlines should be mosquito-proofed. Mosquito-proofing of domestic wells and storage tanks of underground water should be undertaken. Masonry chambers of sluice valves and water meters are required to be provided with soak pits as part of preventive maintenance.

Environmental manipulation includes draining of water supply installations such as water collection and leakages in masonry chambers, distribution pipes, valves, sluice valves, surface boxes for fire hydrants, water meters and so on. These collect water and serve as significant *Ae. aegypti* larval habitats in the absence of preventive maintenance.

In addition, the containers for domestic use are the major sources of *Ae. aegypti* breeding in most urban areas in South East Asia. Water storage containers should be covered with tight-fitting lids or screens, and care being taken to replace them after water is used.

Flower pots, vases and traps are also the common source of *Ae. aegypti* breeding. These should be punctured to produce a drain hole. Conversely, live flowers can be placed in a mixture of sand and water. Flowers should be removed and discarded weekly and vases scrubbed and cleaned before reuse. Brass flower pots, which make poor larval habitats, can be used in cemeteries instead of traditional glass containers. Ant traps can be treated with common salt or oil.

Desert (evaporation) water coolers, condensation collection pans under refrigerators and air conditioners should be regularly inspected, drained and cleaned.

The design of buildings is also important to prevent Ae. breeding. Drainage pipes of rooftops, sunshades and porticos often get blocked and become breeding place of Ae. mosquitoes.

On the other hand, fire prevention regulations may require mandatory water storage. Such storage tanks need to be kept mosquito-proofed. Metal drums used for the water storage at construction sites also should be mosquito-proofed.

Furthermore, solid wastes, namely tins, bottles, buckets or any other waste material scattered around houses, should be removed and buried in land fills. Household and garden utensils, such as buckets, bowls and watering devices, should be turned upside down to prevent the accumulation of rain water. Similarly, canoes and small boats should be emptied of water and turned upside down when it is not used. Plant waste like coconut shells and cocoa husks should be disposed of properly and without delay.

Used automobile tires are also the common breeding sites of urban Ae. Tire depots should always be kept under cover to prevent the collection of rain water.

Fences and fence posts made from hollow trees like bamboo were cut down to the node, and concrete blocks should be filled with packed sand, crushed glass or concrete to eliminate potential Ae. larval habitats.

Similarly, glass bottles, cans and other small containers should be buried in land fills or crushed and recycled for industrial use. [1]

2.1.8.2 Personal Protection

Cloth reduces the risk of mosquito biting if the cloth is significantly thick or loosely fitting. Long sleeves and trousers with stockings may protect the arms and legs, which are the sites mosquitoes prefer to bite. School children should follow these practices whenever possible. Impregnating cloth with chemicals such as permethrin can be especially effective to prevent mosquito bites.

Household insecticidal products, such as mosquito coils, pyrethrum space spray and aerosols, have been used extensively for personal protection against mosquitoes. Electric vaporizer mats and liquid vaporizers are marketed in urban areas.

Repellents are also very common for personal protection. This is broadly classified into two categories, natural repellents and chemical repellents. Essential oils from plant extracts are the main natural repellent ingredients. Chemical repellents such as DEET (N, N-Diethyl-m-Toluamide) can provide protection against *Ae. albopictus*, *Ae. aegypti* and *anopheline* species for a few hours. Permethrin has effect when it is impregnated in cloth.

On the other hand, insecticide-treated mosquito nets (ITMN) and curtains have limited utility in a dengue control prgramme, because the vector species bites during the day. It is however effective for the people who sleep in day time, such as infants and night workers. [1]

2.1.8.3 Biological Control

The application of biological control agents which are directed against the larval stages of dengue vectors has been somewhat restricted to small scale field operations in South-East Asia.

Larvivorus fish (Gambusia affinis and Poecilia reticulata) have been extensively used for the control *An. Stephensi* and/ or *Ae. aegypti* in large water bodies or large water containers in many countries in South East Asia. The applicability and efficiency of this control measure depends on the type of containers.

Two species of endotoxin-producing bacteria, *Bacillus thuringiensis serotype H-14* (Bt.H-14) and *Bacillus sphaericus* (Bs), are effective mosquito control agents. These do not affect non-target species. Bt.H-14 is the most effective against *An. Stephensi* and *Ae. aegypti*, while Bs is the most effective against *Culex*

quinquefasciatus which breeds in polluted water. Bt.H-14 has an extremely low-level mammalian toxicity and has been accepted for the control of mosquitoes in containers for storing water for domestic use.

2.1.8.4 Chemical Control

Larviciding or focused control of *Ae. aegypti* is usually limited by domestic use containers that can not be destroyed, eliminated or managed. It is not fit for a long term basis due to difficult and expensive to apply. The chemical larvicides are best used in certain periods of high risk and in localities which outbreak might occur according to disease and vector surveillance. Establishing the precise timing and location are essential to get maximum effect. Larvae control by environmental sanitation is better than chemical. There are three insecticides that can be used for treating containers which hold drinking water. Firstly, temephos 1% sand granules are applied to containers using a calibrated plastic spoon to administer a dosage of 1 ppm. The effect continues for 8 to 12 weeks, especially in porous earthen jars, under normal water use patterns. Secondly, insect growth regulators (IGRs) prevent development of the immature stage of the mosquito by interference of chitin synthesis during the molting process in larvae or disruption of pupal and adult transformation processes. Most IGRs have extremely low mammalian toxicity. In general, IGRs may provide long term residual effects, from three to six months, at relatively low dosage when it is used in porous earthen jars. IGRs do not cause immediate mortality of the immature mosquitos. Thirdly, Bt.H-14 is commercially proven. It is environmentally-nonintrusive mosquito larvicide and entirely safe for the human body when it is used in appropriate dosage in drinking water. The advantage of Bt.H-14 is that an application destroys larval mosquitoes, but spares any entomophagus predators and other non-target species. Bt.H-14 formulations tend to rapidly settle at the bottom of water containers, and frequent applications are therefore required. The toxin is also photolabile and is destroyed by sunlight.

Furthermore, space spraying involves the application of small droplets of insecticide into the air to kill adult mosquitoes. Organophosphate insecticides, such as malathion, fenitrothion and pirimiphos methyl has especially been used for the

control of adult Ae. vectors. It is the principal method used to control DF and DHF, and is used in most countries in dengue prevalence areas for 25 years. Unfortunately, it has not been effective. Moreover, the space spray has a detrimental effect. Therefore, it should not be used except in the acute period during a major DHF epidemic. The operations however should be carried out at the right time and at the right place. According to the prescribed instructions with maximum coverage, the fog penetration effect is complete enough to achieve the desired results. Generally, there are two forms of space-spray that have been used for *Ae. aegypti* control. They named thermal fogs and cold fogs, such as Ultra-low volume (ULV) and aerosols. Both of them can be dispensed by vehicle-mounted or hand-operated machines.

However, the use of insecticides to prevent and control dengue vectors should be integrated into environmental methods wherever possible. The environmental measure, which integrated into larvicide application in containers, should be during the period of little or no dengue virus activity. On the other hand, when the emergency control occur, both insecticides and source reduction should be undertaken to destroy the population of *Ae. aegypti* rapidly. [1]

2.1.9 Impact of Dengue

2.1.9.1 Economic Impact

Dengue has both direct and indirect costs. Children mainly suffer from DHF/DSS. The severe case should stay in the hospital about five to ten days for intensive care. In 1987, epidemic of DHF/DSS in Thailand, the direct costs including hospitalization and mosquito control were estimated about US$16 million. A report in 1995 estimated that the annual economic burden of DHF in Thailand ranged from US$19 million to US$51 million per year, and it depends on the levels of transmission.

Although the exact economic burden due to DHF is difficultly calculated, DHF and DSS obviously affect to damage the economy and society. [20]

Danielle V. studied about the impact of symptomatic dengue virus infection on the families of patients hospitalized at the Kamphaeng Phet Province Hospital with laboratory-confirmed dengue in 2001. It showed that the disability-adjusted life years (DALYs) lost for fatal and non-fatal cases of dengue. The direct cost of hospitalization, indirect costs due to loss of productivity and the average number of infected household per family were also calculated. A financial loss was approximately US $61 per family, which was more than the average monthly income in Thailand. The DALYs were 427 DALYs/million population in 2001. This figure showed that the impact order of symptomatic dengue virus infection was the same as the impact of several other diseases, such as the tropical cluster, trypanosomiasis, Chagas disease, schistosomiasis, leishmaniasis, lymphatic filariasis, onchocerciasis, malaria, meningitis, and hepatitis. [29]

Furthermore, Adults need to take care of their children when their children are in the hospital. They may need to be absent from their work. Besides that, the costs for vector controls are required for local municipalities, and if DHF spreads in their area, they lose revenue from tourists. [20]

Okanurak [30] conducted a study in Thailand to assess the economic burden of DHF patients and of the Thai government for treatment, prevention and control of DHF. Patient burden was reported by caretakers who stayed with the admitted patients in three hospitals; Children's Hospital in Bangkok, Suphan Buri Provincial Hospital, Don Chedi Community Hospital in Don Chedi District in Suphan Buri. The hospital costs, which included medicine and laboratory costs, were collected from the treatment forms, and the routine service cost was estimated by the staff of the hospitals. Cost of prevention and control were compiled from the budget reports of the Ministry of Public Health and the Ministry of Interior. Based on 184 DHF patients admitted at the three hospitals, the direct patient costs per patient for one episode of DHF including treatment cost and the costs of travel, food and lodging was US$66.99 and US$61.02 in Bangkok and Suphan Buri respectively. The total patient cost, including both direct patient costs and opportunity costs, was US$118.29 for a child patient and US$161.49 for an adult patient in Bangkok, and in

Suphan Buri it was US$102.82 for a child patient and US$138.02 for an adult patient. The net hospital cost in providing treatment for each DHF patient was US$54.6 in Bangkok and US$38.65 in Suphan Buri, respectively. The total expenditure on DHF prevention and control in Thailand by government agencies in 1994 was US$4.8724 million. As a result, the whole expenditure of Thailand for DHF in 1994 would be at least US$12.596 million, 54.8 percent from the government budget and 45.2 percent paid by 51,688 patients and their families. The study concluded that in recording the economic-loss from DHF both the expenditures of the government and the patient costs, direct and indirect, should be taken into account.

Shepard et al estimated individual treatment costs including health clinic visits, hospitalization, medications, travel expenses and patients' time seeking treatment for children for South East Asia at US$139 for DHF and US$4.29 for DF. This estimation implied that annual costs in this region are US$105 million, which is US$69.5 million for DHF and US$35.5 million for DF. Extrapolating from current trends, based on the cases reported to WHO since 1960, this figure will increase to an average US$118 million each year through the first decade of the 21st century. Using the Thailand study, if the value of productive work lost is added, this figure doubles to US$236 million. Thus, during the next decade, South East Asian economies could lose a total of US$2.36 billion due to DF and DHF. [31]

2.1.9.2 Impact on Society

During the transmission season, the increased number of DHF cases causes parents to be anxious for their children's survival and the financial consequences of emergency medical care. Van Damme et al [32] conducted a study in Cambodia in 2004. After a dengue epidemic, 72 households were interviewed about health-seeking behaviour, out-of-pocket expenditure and how they financed such expenditure. Then one year later, a follow-up visit investigated how the 26 households with an initial debt had coped with it. The amount of expenditure mostly depended on where the households sought care. The households used a combination of savings, selling consumables, selling assets and borrowing money to finance this expenditure. One year late, most families with initial debts had been unable to settle these debts, and continued to pay high interest rates. Several households sold their

land. In conclusion, even relatively modest out-of-pocket health expenditures frequently cause indebtedness and can lead to poverty. A credible and accessible public health system is needed to prevent catastrophic health expenditure, and to allow for other strategies, like safety nets for the poor, to be fully effective. Even though dengue affects all strata of society, it may selectively affect the poorest. Most larval habitats in dengue-endemic countries are artificial, such as water storage containers, flower vases, discarded food containers, used tires and habitats created by poor design of roof gutters and drains. Local vector ecology is largely determined by community social and cultural practices and infrastructure, and increasing urbanization typically attracts the poor to periurban settlements with deficient water supplies. A study conducted by Nagao et al [33] in Thailand in 2003 showed higher *Ae. aegypti* infestations where water distribution systems were deficient or unreliable. The correlations of three indices of Ae. larval abundance, which were housing index, container index and Breteau index, were tested against 38 socio-economic and four climatic variables. Availability of public water wells, existence of transport services and proportion of tin houses were positively associated with larval indices. Private water wells, health education, health insurance coverage, thatched houses and use of firewood for cooking were negatively associated. These probably represent both direct effects on breeding sites and more general effects of health-related attitudes, housing quality and remoteness from urban areas. Private and public wells decreased necessity to store water, and health education might encourage removing breeding site. Indices were positively associated with daily minimum temperature, an increase in precipitation from the previous month, which reflected the onset of the rainy season, and daily maximum temperatures of approximately 33-34 degrees Celsius. The associations were used to derive statistical models to predict the rank order of larval indices within the study area. The study provides a rational basis for identifying possible social interventions, and for prioritizing previously unsurveyed villages for further monitoring and focalized vector control.

In countries with weak or unprepared health services, epidemics of dengue can be extremely disruptive and health services can be rapidly overwhelmed. Governments frequently declare states of emergency to mobilize additional resources

against dengue outbreaks, sometimes deploying the army to eliminate or apply larvicides to larval habitats. These responses are often launched at or after the peak of the epidemic, and the decline in transmission is unjustifiably attributed to the intervention rather than to the natural epidemic decline. [31]

2.2 Health Belief Model

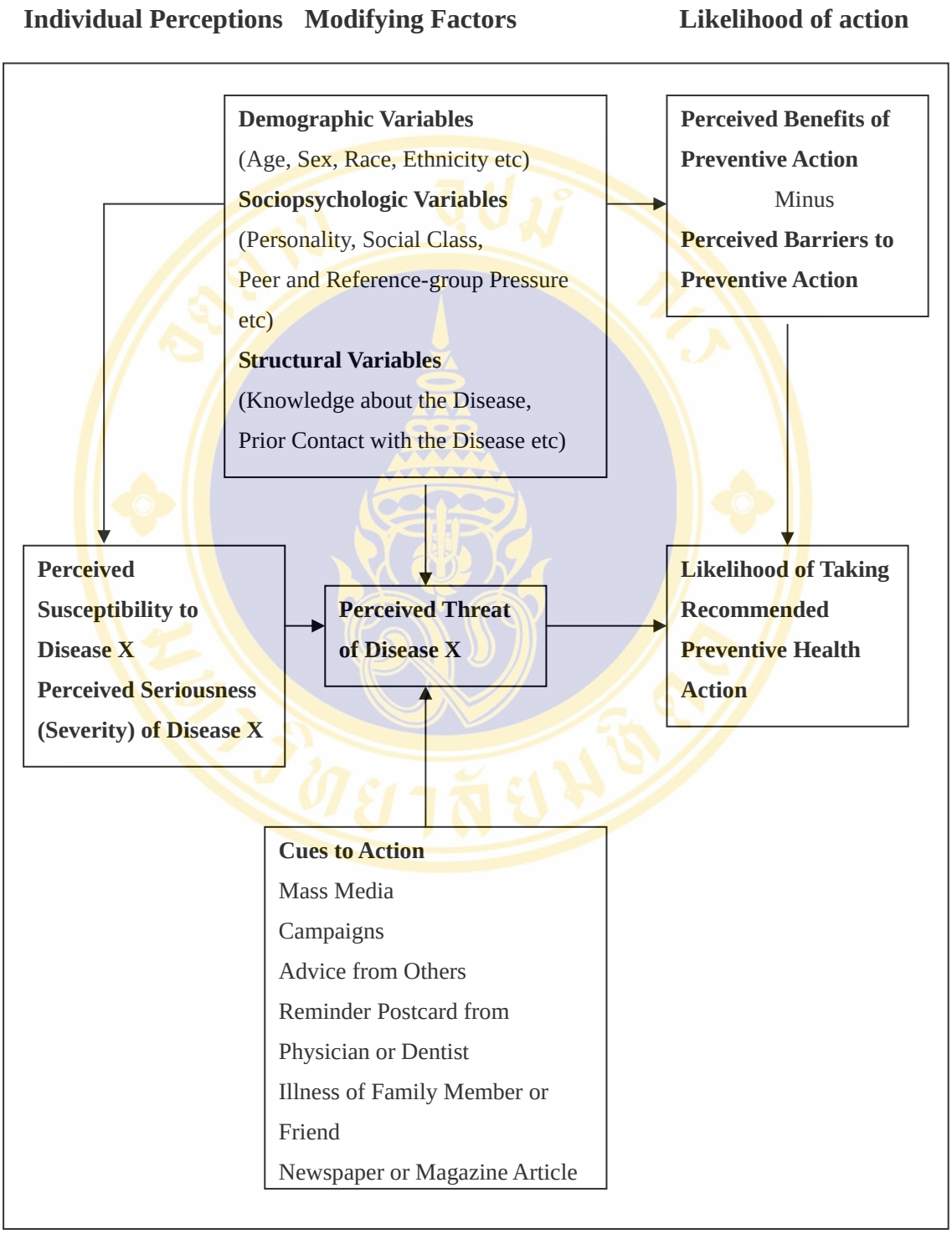


Figure 14 The Health Belief Model [34]

The health belief model (HBM) is a cognitive theoretical model developed by Kurt Lewin during the 1950s. This model explains why some people are motivated to engage in health-seeking behaviuor while others fail to take protective actions. [34, 35] The model is useful to predict those individuals who use or do not use preventive measures and to suggest interventions which might increase predisposition of resistant individual to engage in health-protecting behaviours. The model was modified by Becker is presented in Figure 14.

Preventive actions occur where we perceive a threat to personal health and where the benefits of taking action to protect health outweigh the barriers. Beliefs of personal susceptibility and the seriousness of a specific disease combine to produce the degree of threat or negative valence of a particular disease. Perceived susceptibility reflects individuals' feeling of personal vulnerability to a specific health problem. Perceived seriousness or severity of a given health problem can be judged either by the degree of emotional arousal created by the thought of having the disease or by the medical and clinical or social difficulties. For example, family and work life, that individuals believe a given health condition would create for them. Perceived benefits are believes about the effectiveness of recommended actions in preventing the health threat. Perceived barriers are perceptions concerning the potential negative aspects of taking action such as expense, danger, unpleasantness, inconvenience, and time required. Demographic, sociopsychologic, and structural variables affect action tendencies through their relationship with perception of threat. HBM is appropriate as a paradigm for health-protecting or disease-preventing bahaviour. [34]

Janz and Becker [34] concluded that perceived barriers are the most powerful of the HBM dimensions in explaining or predicting various health behaviours. Perceived susceptibility is also important to understand preventive behaviours. Both perceived benefits of taking action and perceived seriousness of disease lacked power to explain or predict health-protecting behaviour. Therefore, two component variables in the model rather than the whole model appear relevant to design health-protective interventions. In 1988, Rosenstock et al proposed that

self-efficacy should be added to the HBM as an explanatory variable and suggested that it is incorporated in interventions based on the model. Burns has suggested that further additions to the model might include variables of emotional response, behavioural norms, and intention.

Hmwe Hmwe Kyu [36] used health belief model in a study conducted to assess the knowledge attitudes and practices (KAP) to prevent DF among Myanmar migrant woman caretakers in Mae Sot District in Tak province in Thailand in 2004. The variables were age, education level, occupation, marital status, monthly family income, duration of stay in Mae Sot in demographic characteristics, knowledge of DF and attitude towards DF, preventive practices on DF and source of information. The result found a significant association between respondent's duration of stay in Mae Sot District and knowledge, knowledge and attitude, and attitude and preventive practices on DF. It indicated that if migrant women are supplied with correct knowledge through appropriate channels, they may change their attitudes and, ultimately, their practices.

Phan Quan [37] also used health belief model in the survey. This study was conducted to reveal the preventive practice against DF/DHF and its correlating factors to the residents in Phong Dien townlet in Vietnam in 2001. Age, gender, occupation and education were set as variables of socio-demographic characteristics. Furthermore, knowledge and attitude towards DF/DHF prevention practice and residents' participation and their support sources for DF/DHF prevention were set as variables as well. Then DF/DHF prevention practice was set as a dependent variable. Consequently, it was found there were significant associations between knowledge, attitude, residents' participation and their support sources, and occupational groups and the residents' preventive practice. There were however no significant associations between gender, age groups and education groups and the residents' practice for prevention against DF/DHF.

Tran Ngoc Huu [38] used health belief model in the study as well. The study was conducted to describe factors affecting DHF prevention behaviour among

housewives in Vietnam in 1998. Socio-demographic characteristics such as age, occupation and education, social activities, knowledge, perceptions and attitude were examined. The study revealed there were significant associations between housewives knowledge on DHF, perception on severity, susceptibility to DHF and benefit, difficultly of DHF prevention, attitude on community-based DHF prevention methods, social activities and housewives' DHF prevention behaviour.

2.3 The Related Study

2.3.1 Socio-Demographic Factors

2.3.1.1 Age

Age is the most significant determinant of differences in traits among all person variables. [39]

B. H. B. van Benthem [40] conducted a survey in three areas in northern of Thailand in 2001, and found that knowledge of dengue significantly differed by age, sex, occupation. Younger people have more knowledge than elder people. It therefore concluded that the group of housewives, unemployed and older people may need special attention in future on dengue education programmes.

Susilowati A. [41] conducted a KAP survey to analyse the correlation of the housewives' awareness about DHF and its control in Indonesia. A correlation was found between the housewives' practice in controlling DHF. Every increase of 10 years in the age of a housewife resulted in a better practice by 2.88 times.

Somchai T. [42] conducted a survey among family leaders to identify the factors associated with preventive behaviour on DHF in Ban Chang-Lo, Bangkok-Noi in 2005. It was found that there was no association between age and preventive behaviour against DHF among the family leaders.

Phan Quan [37] conducted a study about preventive practice against DF and DHF and its correlating factors of Phong Dien Townlet Residences in Vienam in 2001. It found that there was no association between age group and preventive practice against DF/DHF. Thus, the residents in the categorized age group had the same practice for prevention of DF/DHF.

Tran Ngoc Huu [38] conducted a study to describe factors affecting DHF preventive behaviour among housewives in Vietnam in 1998, and found out there was a significant relationship between age group and DHF preventive behaviour. Especially age 35 to 44 years group had high preventive behaviour.

2.3.1.2 Sex

Somchai T. [42] found that there was no association between the preventive behaviour on DHF among family leaders, which meant both genders took the same preventive behaviour. Also in the work of Phan Quan [37], he concluded that there was no association between gender and preventive practice among the residents.

2.3.1.3 Educational Level

Persons with higher education levels are more prevention oriented, know more about health matters, and have a better health status. Some disease variables may not show much of a cause-effect association when correlated with education. Yet, education as a trait of the person does have an effect on the health status of the population and this variable should not be overlooked in epidemiological research and reports. When combined with other traits of the person such as age, much information can be learned about populations. For example, when educational attainment and age are compared, different age groups show different levels of education. [39]

Some researchers find no significant association between education and prevention.

Somchai T. [42] concluded that there was not significant association between education level and preventive behaviour among family leaders. It meant that any level of education had not changed the preventive behaviour of the family leaders. Phan Quan [37] found that there was no association between education and preventive practice. This meant the preventive practice between low education group and high educated group was not significantly different. Tran Ngoc Huu [38] also

resulted that there were no significant association between education level of housewives and preventive behaviour against DHF.

2.3.1.4 Income

Susilowati A. [41] found that there was a significant correlation between the income of household and the presence of DHF cases with the housewives' knowledge about controlling DHF. The more the income of the household increased, the better knowledge the respondent had. On the other hand, Somchai T. [42] concluded that there was not a significant association between income and preventive behaviour against DHF among family leaders.

2.3.1.5 Duration of Stay

Hmwe Hmwe Kyu [36] found that there was significant association between respondents' duration of stay in Mae Sot District and knowledge. Those respondents who lived in Mae Sot more than three years had better knowledge of DF than migrants who lived there less than three years.

On the other hand, Maria Theresia Benner [43] conducted a study to assess the factors determining malaria prevalence among migrants from Myanmar in Tak province in 1997. It however did not show any significance between duration of stay in the area and the different malaria groups.

2.3.2 Knowledge

Kittigul L. [44] conducted the KAP survey of their care takers between July 1998 and June 1999 to identify dengue virus-infected patients who are under 15 years old admitted to seven government hospitals in Ang Thong Province, a central region of Thailand. The majority of interviewees were mothers whose educational level was primary school. Half of the care takers were workers. There was no difference in DHF knowledge among the care taker dengue cases, non-cases and healthy students. The results indicated that DHF remains a public health problem in this area therefore the community participation and continuous campaigns were still required for prevention and controlling DHF successfully, and the people need more understanding of the disease.

B. H. B. van Benthem [40] found that knowledge of dengue among students was significantly higher than farmers, but lower than farmers among housewives and unemployed. Furthermore, it was found that people with knowledge of the disease more frequently reported preventive measures than the people without knowledge. It seems that educational programmes are valuable as a tool in dengue prevention.

Hairi F [45] conducted a KAP study on dengue among selected rural communities in the Kuala Kangsar District in 2002. The research was to assess the level of KAP against dengue and its vector Ae. mosquito in Kuala Kangsar District. According to this survey, the knowledge of respondents in the rural community was good. The main source of information on dengue was television/radio. Thus, mass media was an important resource to convey health messages to the public among the rural population. Furthermore, the respondent's attitude was good and most of them were supportive of Ae. control measures. The result also indicated that there was a significant association found between knowledge of dengue and attitude towards Ae. control. It was also found that good knowledge does not necessarily lead to good practice. This was most likely due to certain practices like water storage for domestic use, which was deeply ingrained in the community.

Susilowati A. [41] found that there was a significant correlation between the housewives' knowledge and their practice in controlling DHF. People with better knowledge had as high as 3.43 times better practice.

Hmwe Hmwe Kyu [36] found significant associations between the duration of respondent stay in this District and knowledge, knowledge and attitude and attitude and preventive practices on DF. The study indicated that if pertinent knowledge is supplied to migrant females by appropriate channels, their attitude may be changed, and ultimately their practices as well.

Somchai T. [42] however found that there was no significant association between knowledge and preventive behaviour. It meant that even targets had a good knowledge about the disease and the prevention of DHF, but they might not have done prevention. Furthermore, it found that most of the family leaders had the moderate or high level of knowledge about DHF and prevention, and family leaders who had more knowledge about the disease and prevention would have low risk

preventive behaviour as well.

Phan Quan [37] found that 64.2 percent of residents attained a high knowledge score. 90 percent of residents had high level of general knowledge. However, only 59.4 percent of residents had a high knowledge about transmission, and 59 percent of them correctly answered for the question whether *Ae. aegypti* bite in daytime. Regarding the knowledge about prevention of dengue, 93.9 percent of residents answered that avoiding mosquito bites is a preventive measure. Furthermore, Phan found an association between knowledge and preventive practice. The high knowledge group had nearly three times higher preventive practice than the low knowledge group.

Tran Ngoc Huu [38] found that 96 percent of the housewives agreed with covering water containers, and 72.6 percent of the respondents agreed with using larvae fish in water containers. Furthermore, 90.9 percent of housewives answered that weekly cleaning of unnecessary containers can reduce the number of mosquitoes, but only half of them accepted to do weekly cleaning. 79.4 percent of the housewives agreed with sleeping in the mosquito-net in daytime helps to prevent DHF. Furthermore, it was found that there was a relationship between knowledge attitude and preventive behaviour.

2.3.3 Perception

Therawiwat M [46] assessed the effectiveness of a community-based approach programme in two villages of Muang District, Kanchanaburi Province, and found that knowledge, perceived susceptibility, self-efficacy and larval survey practices in the experimental group were significantly higher than before the experiment, and higher than the comparison group in the study. Container Index, House Index and Breteau Index decreased sharply to exceed the national target.

Tran Ngoc Huu [38] found that most housewives perceived DHF as a severe disease that may cause death if children are not treated early. However, 14 percent of the target agreed that there is no specific treatment for DHF. Regarding susceptibility, 74 percent perceived that children are susceptible to DHF. About the benefit of DHF prevention, 57 percent of the respondents believed that the treatment of DHF costs a lot compared with their economic situation, and 70 percent of the

housewives answered it takes a lot of time to take care of the patient. 72 percent of them believed that there are some ways to prevent DHF, 63 percent believed there are some ways to control the mosquito that causes DHF. A significant relationship between perception on severity, susceptibility, benefit and difficulty of DHF prevention and DHF prevention behaviour was found in this study.

2.3.4 Cues to Action

2.3.4.1 Advice from Health Personnel

Swaddiwudhipong W. [47] conducted the KAP survey to evaluate the effect of a health education programme on the prevention and control of DHF in the municipality of Mae Sot, Tak Province in 1990. 417 adult residences, mainly housewives, were selected and interviewed. The survey was implemented in late April 1990 to assess their knowledge of DHF and practice of preventive methods. As a result, health education played an important role to disseminate the information on preventive methods against DHF. Radio and TV were effective mass media for public health education against DHF in that area.

Gupta P [48] conducted a research in 1997 to assess the KAP against dengue among the residents in rural and slum areas in East Delhi. This survey found that audiovisual media was the most common source of information in both areas. A high level of dengue awareness was observed among the respondents who received the health education and information campaign from mass media. Knowledge about the disease was fair to good, particularly among the urban residents. Fever was the most common symptom which is known, then bleeding and headache followed. The mosquito was known to spread the disease. Moreover, the majority of the sample group used some method of mosquito control or personal protection during the epidemic. It also concluded that prevention of dengue must start within the locality to ensure that the people are receptive to the messages and easy to adopt behavioural changes.

Therawiwat M [46] held the monthly meeting with the key stakeholders and was used to share experiences learned, to reflect on the programme outputs and outcomes as well as to plan for the next cycle of programme activities in the study.

As a result, community status as community leaders was the best predictor for larval survey behaviour at the first survey. Participating in the study programme activities was the best predictor at the end of the programme. The result of this study suggested that monitoring the disease control programme outputs and outcomes should be performed regularly during monthly meetings, and local health officers need to be empowered for these matters.

Hmwe Hmwe Kyu [36] found that the respondents in Mae Sot District in Tak province in Thailand had a moderate level of knowledge about DF, and one third of the respondents who received the information about dengue were from their families, friends and neighbours. The other respondents got the information from TV, pamphlet, hospital and clinic, newspaper, magazine, radio and school.

Somchai T. [42] found that most family leaders had received advice and supervision from the health officers. Especially, they got advice and supervision on prevention of mosquito bite, elimination of breeding place, and cause of DHF, while the information about sleeping in mosquito nets and screen was lower than the other information. Besides that, the study found that 52.9 percent of family leaders got the information from media, especially TV, announcement from the public health center, and heath volunteers, but less received it from brochures and health line in the community. There was significant association between the information about the prevention of DHF from mass media and preventive behaviour. It showed that the more information family leaders got, the better the result of preventive behaviour they took. In addition, the advice and supervision from public health officers about the prevention of DHF in the target group had significant association to the risk preventive behaviour. It meant that more advice and supervision from public health officers could have lower risk of the preventive behaviour among the family leaders.

Phan Quan [37] found that there was a relationship between support resources for DF/DHF prevention and preventive practice. 84.3 percent of residents got the support from the health staff to prevent DF/DHF. 64.6 percent of residents answered that their health staff visited to their houses. The residents who belong to low support sources group had twice lower preventive practice than high support sources group.

Tran Ngoc Huu [38] mentioned 78.9 percent of the housewives received training or some printed materials for prevention of DHF to accept larvivorous fish.

2.3.4.2 Illness of Family Member

Kittigul L. [44] found that the care takers of dengue cases had a higher response in prevention, control and treatment of DHF than non-cases and healthy students after their children were admitted to hospital.

However, Susilowati A. [41] found that the housewives with the presence of DHF cases had 0.28 times less knowledge than housewives without them. In addition, a significant correlation was found between the presence of cases with the housewives' behaviour in controlling DHF. Housewives with the presence of DHF cases had a preventive behaviour level 0.41 times lower than the housewives without cases.

2.3.5 Preventive Behaviour

Swaddiwudhipong W. [47] concluded that more than 90 percent of respondents knew that the disease is transmitted by Ae. mosquitoes and indicated water jars and water retention in the houses as the common breeding places. Ant traps and cement baths, the common breeding places, were less frequently mentioned. It meant that many residents do not take any larval control methods for these two mosquito breeding sites. The most common practice was to cover water containers for drinking water to prevent the mosquito breeding. While, the methods which are add abate, temephos sand granules or change stored water frequently were commonly used for non-drinking water storage. Larval control for ant traps was mainly accomplished by the addition of chemicals, including abate, salt, oil or detergent. The residents accepted to join the Ae. control programme by the health education which was conducted by health personnel.

Peter J [49] conducted a survey to evaluate the community based dengue prevention programmes which was studied in Puerto Rico in 1995. Four programmes, namely the Head Start module, public school programme, posters and televised Public Service Announcements (PSAs) and a Children's Museum exhibition on *Ae. aegypti* were evaluated respectively by using knowledge and practices surveys

administered to children and their parents, surveys of house lots for larval container habitats, focus groups, and interviews with programme organizers and participants. It found that the programmes were associated to increased dengue-related knowledge, increased proportion of protected tires against rain, decreased proportion of water storage containers and increased indoor use of aerosol insecticides. Moreover, the elementary school programme was associated with slightly lower indices of residential mosquito infestation. The programmes induced high levels of awareness, some behaviour changes and limited change in larval indices among children and their parents. Emphasis on the skills which are necessary for community members to keep containers free of mosquito larvae increases programme effectiveness.

Somchai T. [42] found that most of the family leaders had moderate risk in prevention of DHF. Around 43 percent of family leaders use the mosquito insecticide and smog in the community during an outbreak of DHF, and the others like container, flower vase, plant's pot plate, toilet cemented discarded and coconut shell had low risk.

On the other hand, Phan Quan [37] found that 56.8 percent of the residents stood at high practice scores for prevention of DF/DHF in the study. Using mosquito repellents was especially higher than any other practices. Half of the residents (50.7%) treat water containers well, and 41.9 percent of residents had a high practice to destroy mosquito breeding sites. Moreover, 45.9 percent of residents and their children slept in the mosquito net in the daytime.

Tran Ngoc Huu [38] found that 70 percent of the housewives do not cover any containers, and 47.1 percent of them drop at least one larvivorous fish in the container during last rainy season, but 9.4 percent of them continue to do it during dry season as well. Moreover, 84.8 percent of respondents answered that they completely remove discarded containers every week. Only 37.2 percent of housewives always prepare their children to sleep in mosquito-net daytime.

CHAPTER 3
RESEARCH METHODOLOGY

3.1 Research Design

This was a cross sectional study with descriptive components. The main purpose was to study the factors related to demographic variables, structural variable, cues to action and preventive behaviour against DHF among migrants in Muang District, Samut Sakhon.

3.2 Study Population

The study population was the migrant workers in Muang District, Samut Sakhon ranging from 15 to 50 years old.

3.3 Sample Size

The sample size of this study was estimated by

Formula: $n = \frac{Z^2P(1-P)}{E^2}$ [50, 51]

Where

n= The number of migrant to be investigated

Z at 0.05 (critical region), 1.96

E= Degree of accuracy (0.07)

P= 0.29 Proportion of the good preventive practices against DF. [36]

$n = \frac{1.96^2(0.29)(1-0.29)}{0.07^2}$

$= 161.42559$

≈ 162

Then, the sample size of this study was 162 cases.

3.4 Sampling Technique

Muang District of Samut Sakhon province was purposively selected. The basis of the selection was the high prevalence of DHF cases with the largest district with higher migrant population.

3.5 Data Collecting Tools and Methods

The instrument that was used for data collection is a structured questionnaire. It was translated from English to Thai, and Thai to Burmese. The migrant workers were interviewed by trained interviewers. After data collection, the questionnaire was tested for validity and reliability. 30 cases were collected for reliability-test, and examining the knowledge part by KR20, and perception part by Cronbach's alpha coefficient. The result of the pretest was 0.58 for the knowledge part, and 0.54 for the perception part.

3.6 Research Instrument and Measurement

The questionnaire had five parts as follow:

Part 1: Demographic Variables

Age: it was grouped into 2 categories, 15-32 years and 33-50 years old.

Sex: Defined as sex of migrants, male and female.

Education level: Defined as the level of study of migrants, and categorized into 5 groups as follows:

No education
Primary school (Grade 1, 2, 3, 4, 5, 6)
Secondary school (Grade 7, 8, 9)
High school (Grade 10, 11, 12)

Higher Education.

Income: Referred to the total income of migrants per month. It was categorized into 3 groups as follows,

Low income ≤2,700 Baht/month

Moderate income 2,701-5,299 Baht/month

Higher income ≥5,300 Baht/month.

Duration of stay: it was categorized into 3 categories as follows: less than 36 months (<3 years), 36-120 months, and more than 120 months (>10 years).

Part 2: Knowledge

Respondents' knowledge of DHF was composed of the cause (transmission, environment), symptom, treatment, preventive method of DHF. There were 11 questions. If migrants correctly selected the answer, they got 1 score. The score was varied from 0 to 11. The level of the respondents' DHF knowledge was categorized into 3 groups: [52]

High level: > 80 percent correct responses.

Moderate level: 60-80 percent correct responses.

Low level: < 60 percent correct responses.

Part 3: Perception

Perception was composed of susceptibility, seriousness, benefits and barriers. There were 22 questions in three scales, disagree, undecided and agree [53]. Minimum score was 22 and maximum score was 66. The scores of all variables were summed up, and the mean and standard deviation (SD) were calculated.

Positive Statement		**Negative Statement**	
	Score		Score
Agree	3	Agree	1
Undecided	2	Undecided	2
Disagree	1	Disagree	3

Furthermore, perception was categorized into 3 levels by using following formula

$$\frac{\text{Maximum score} - \text{Minimum score}}{\text{Number of the level}}$$ [54]

Then the perception can be categorized by

Low Level	22-36
Moderate Level	37-51
High Level	52-66

Part 4: Cues to Action

The question was asked about respondents' experience of migrants who have ever had contact with DHF patients, and the way to receive the information or advice about DHF of the migrants in Muang District.

Part 5: Preventive Behaviour

The preventive behaviour was composed of 7 questions about using a mosquito net/ screen, repellent, destroying mosquito breeding sites and biological larvicide (fish). The score for each question was given as

	Score(s)
Often	3
Sometimes	2
Rarely	1
Never	0

The total score for risk behaviour was summed up. The highest score was 21, and lowest score was 0. The preventive behaviour was then categorized into 3 levels by using the follow scales. [54]

Low Level	0-7
Moderate Level	8-13
High Level	14-21

3.7 Data Analysis Procedure and Statistics Used

EpiData 3.0 software was used for data entry and error detection, and the data was analysed by using MINITAB 13.0. Descriptive statistics and chi-square test were used to analyse the data at the significance level of 0.05.

1. Frequency and percentage were used for the analysis of all variables.
2. Mean and standard deviation were calculated for the analysis of quantitative data such as age, income, duration of stay, knowledge perception and preventive behaviour.
3. Chi-square was used for the analysis of the association between demographic variables, knowledge, perception and cues to action and preventive behaviour.

CHAPTER 4
RESULTS

The purpose of this study was to identify the factors related to DHF preventive behaviour of migrants in Muang District, Samut Sakhon Province, Thailand. A total of 201 migrants who work in Muang District, Samut Sakhon aged 15 to 50 years old were interviewed using a structured questionnaire from February 5-8, 2007. After screening for missing data, 176 responses were used for analysis. The rest were discarded.

Descriptive statistics were used for the analysis of all variables, and Chi-square test was applied to find out the association between demographic variables, knowledge, perception and cues to action and preventive behaviour of migrants. The level of significance was set at 0.05.

This chapter shows the outcome of analysis of the responses. The results from the data analysis will be presented in 2 parts as follows:

Part Ⅰ: Descriptive Statistics

Part Ⅱ: Association Between Independent Variables and Preventive Behaviour

Part Ⅰ Descriptive Statistics

4.1.1 Demographic Data

The descriptive statistics for socio-demographic characteristics of migrants is analysed in Table 1. 85.23 percent of respondents were migrants from 15 to 32 years old and 14.77 percent of respondent were from 33 to 50 years old. The average age was about 26 years old and SD was 6.78. Minimum age was 16 and maximum age was 49 years old. The respondents were 52.84 percent male and 47.16 percent female.

The educational background of respondents was largely Lower Secondary Education and elementary level with 43.75 percent and 32.95 percent respectively. 17.61 percent were at the Upper Secondary Education level. Only 3.98 percent of the study group finished higher education, while 1.70 percent had no education.

The individual monthly income ranged from 0 Baht to 8,000 Baht ($\overline{X}$ = 4,673 and SD= 1,446). 63.64 percent of respondents earned between 2,701 Baht and 5,299 Baht per month. As much as 30.68 percent claimed to gain equal to or over 5,300 Baht per month. However, only 5.68 percent of respondents reported that their individual income was equal to or less than 2,700 Baht monthly.

For the duration of stay in Samut Sakhon, nearly half of the respondents (49.43%) was between 36 and 120 months (3-10 years). Another 47.16 percent of them reported that they stayed less than 36 months (3 years). In contrast, 3.41 percent of them stayed more than 120 months (10 years) in this province. The average stay of respondents was about 45 months with SD equal to 41.10. The minimum stay was 2 months, and the longest stay was 360 months.

Table 6 Frequency and Percentage of Demographic Variables

Demographic Variables	**N= 176**	**%**
Age Group		
15-32	150	85.23
33-50	26	14.77
Mean= 26.21 SD= 6.78	Min= 16.00 Max= 49.00	
Sex		
Male	93	52.84
Female	83	47.16
Educational Level		
No education	3	1.70
Elementary Education (Grades 1-6)	58	32.95
Lower Secondary Education (Grades 7-9)	77	43.75
Upper Secondary Education (Grades 10-12)	31	17.61
Higher Education	7	3.98
Income (Baht/month)		
≤2,700	10	5.68
2,701-5,299	112	63.64
≥5,300	54	30.68
Mean= 4,673 SD= 1,446	Min= 0 Max= 8,000	
Duration of Stay (month)		
<36	83	47.16
36-120	87	49.43
>120	6	3.41
Mean= 44.78 SD= 41.10	Min= 2.00 Max= 360.00	

4.1.2 Knowledge about DHF and preventive behaviour

The result of the knowledge part is described in Table 7. This study reveals that more than 70 percent of respondents had a low level of knowledge. 24.43 percent got a score of 60 to 79 percent which refers to moderate, and 4.55 percent of respondents had a high level of knowledge. The average score was 5.11 with SD of 2.16. The range of score was from 0 to 10.

Table 7 Frequency and Percentage by the Level of Knowledge on DHF

Knowledge	**N= 176**	**%**
Level of Knowledge		
Low Level (<60 percent)	125	71.02
Moderate Level (60-80 percent)	43	24.43
High Level (>80 percents)	8	4.55
Mean= 5.11 SD= 2.16 Min= 0.00 Max= 10.00		

Table 8 itemizes the number and percentage of correct answers by each question in the knowledge part. Almost 70 percent of respondents knew that *ae. aegypti* causes DHF. 53.41 percent answered the statement correctly that rainy season is the most DHF epidemic season, and 45.45 percent of them correctly noted the cause of DHF and the biting time of the mosquito which causes DHF. However, about 80 percent of respondents did not know the symptom of this disease.

Regarding treatment, 74.43 percent of respondents gave wrong answers about treatment when the children get DHF in the house. Only one third (36.93%) knew that there is no vaccine for DHF.

In regards to preventive methods, 76.14 percent of respondent knew the correct preventive methods for DHF. Approximately half of the study group (51.70%) correctly chose controlling mosquito larvae in water containers. 55.11 percent of respondents and 55.68 percent of respondents gave wrong answers about mosquito's breeding site, and the time for using mosquito net, respectively.

Table 8 Frequency and Percentage of Respondents in Knowledge about DHF, Treatment and Preventive Method

Knowledge of DHF	Correct Answer		$\overline{X}$	SD	Comment
	N= 176	%			
Cause					
1 Rainy season is the most DHF epidemic season.	94	53.41	0.53	0.50	Low
2 Virus is the cause of DHF.	80	45.45	0.45	0.50	Low
3 *Aedes aegypti* transmits DHF.	118	67.05	0.67	0.47	Moderate
4 The mosquito which causes DHF bites during the day time.	80	45.45	0.45	0.50	Low
Symptom					
5 An acute biphasic fever is the symptom of DHF.	35	19.89	0.20	0.40	Low
Treatment					
6 Taking aspirin is the **Wrong** treatment for your child who gets DHF in your house.	45	25.57	0.26	0.44	Low
7 No vaccine can prevent DHF.	65	36.93	0.37	0.48	Low
Preventive method					
8 Avoiding mosquito bites is the most suitable method to prevent DHF.	134	76.14	0.76	0.43	Moderate
9 A mosquito net should be used everytime to prevent DHF.	78	44.32	0.44	0.50	Low
10 Water containers in toilets and ant-traps are the mosquito's breeding sites.	79	44.89	0.45	0.50	Low

Table 8 Frequency and Percentage of Respondents in Knowledge about DHF, Treatment and Preventive Method (Cont.)

Knowledge of DHF	Correct Answer N= 176	%	$\overline{X}$	SD	Comment
11 Leaving water containers without changing water is the **WRONG** method to control mosquito larvae in water containers.	91	51.70	0.52	0.50	Low

Score: Low< 60%, Moderate= 60-80%, High> 80%

4.1.3 Perception towards DHF

Table 9 shows the number and percentage of perception on DHF and preventive behaviour. The table reveals that the majority of respondents (64.77%) are categorized as having a high level of perception, and 35.23 percent had a moderate level. There was no low level of perception. The score was ranged from 42 to 64 with a mean score of 53.23 and a SD score of 4.63.

Table 9 The Frequency and Percentage of Respondents in Perception of DHF

Perception	N= 176	%
Moderate (37-51)	62	35.23
High (52-66)	114	64.77
Mean= 53.23 SD= 4.63	Min= 42.00 Max= 64.00	

Table 10 shows the number and percentage of perception on DHF by each question. In the susceptibility part, most respondents agreed in each statement. However, the percentage of approval about the chance of contracting DHF (Q4 and Q5), and the route of infection were less than the other questions in susceptibility part with 65.91 percent, 57.95 percent and 45.45 percent respectively. In the seriousness part, around 70 to 80 percent of the studied population considered that DHF is serious

health problem, it causes serious impact on health budget and is difficult to give effective treatment for children. In addition, more than 80 percent perceived that taking preventive behaviour has benefit. Only 34.66 percent of respondents agreed that it does not take a time to take care of a DHF patient in the household. Slightly higher than one third of respondents (34.09%) also told that buying chemical sprays at stores is time consuming. Most of respondent (85.23%) agreed that taking preventive behaviour against DHF has difficulties because it is transmitted by the mosquito. 62.50 percent assented that chemical spray causes a bad smell. On the preventive issue, nearly half (42.61%) reported that wearing long sleeves was uncomfortable, and 53.41 percent stated that preventing oneself from DHF contraction was a costly matter. 68.75 percent of respondents also said that taking prevention of DHF helps to save money, while more than half of them (50.57%) accept to use a mosquito net the during daytime.

Table 10 Distribution of Respondents' Perceptions toward DHF and Preventive Behaviour

Statement	Disagree N (%)	Undecided N (%)	Agree N (%)	$\overline{X}$	SD	Comment
Susceptibility						
1. Children and adults easily infected with DHF.	12 (6.82)	20 (11.36)	144 (81.82)	2.75	0.57	High
2. Everyone has an opportunity to be infected by DHF.	14 (7.95)	14 (7.95)	148 (84.09)	2.76	0.59	High

Table 10 Distribution of Respondents' Perceptions toward DHF and Preventive Behaviour (Cont.)

Statement	Disagree N (%)	Undecided N (%)	Agree N (%)	$\overline{X}$	SD	Comment
3. Even if infected with DHF before, you still have a chance to get infected again.	12 (6.82)	20 (11.36)	144 (81.82)	2.75	0.57	High
4. You have a chance infected DHF if you stay in dark and wet places.	22 (12.50)	38 (21.59)	116 (65.91)	2.53	0.71	High
5. You have more chance to get DHF when you have a DHF patient in your house.	39 (22.16)	35 (19.89)	102 (57.95)	2.36	0.82	High
6. Sharing glasses, dishes and towels with DHF patients will not disease.	57 (32.39)	39 (22.16)	80 (45.45)	2.13	0.88	Moderate
7. Sleeping in mosquito nets can prevent you and your family members from being infected with DHF.	4 (2.27)	8 (4.55)	164 (93.18)	2.91	0.36	High

Table 10 Distribution of Respondents' Perceptions toward DHF and Preventive Behaviour (Cont.)

Statement	Disagree N (%)	Undecided N (%)	Agree N (%)	$\overline{X}$	SD	Comment
Seriousness						
8. DHF is a serious health problem.	11 (6.25)	11 (6.25)	154 (87.50)	2.81	0.53	High
9. DHF often causes death to children.	10 (5.68)	14 (7.95)	152 (86.36)	2.81	0.52	High
10. DHF may have a serious impact on health expenditures.	15 (8.52)	35 (19.89)	126 (71.59)	2.63	0.64	High
11. It is difficult to give effective treatment to cure DHF when children get the disease.	33 (18.75)	24 (13.64)	119 (67.61)	2.49	0.79	High
Benefits						
12. Taking preventive methods against DHF will greatly reduce the number of cases.	4 (2.27)	12 (6.82)	160 (90.91)	2.89	0.38	High
13. To take preventive behaviour reduces your anxiety of DHF.	8 (4.55)	17 (9.66)	151 (85.80)	2.81	0.49	High

Table 10 Distribution of Respondents' Perceptions toward DHF and Preventive Behaviour (Cont.)

Statement	Disagree N (%)	Undecided N (%)	Agree N (%)	$\overline{X}$	SD	Comment
14. To take preventive behaviour increases your quality of life.	2 (1.14)	19 (10.80)	155 (88.07)	2.87	0.37	High
15. The prevention of DHF helps you to save money.	23 (13.07)	32 (18.18)	121 (68.75)	2.56	0.71	High
16. It does not take a time to take care of a DHF patient in your household.	84 (47.73)	31 (17.61)	61 (34.66)	2.13	0.90	Moderate
Barriers						
17. It is difficult to prevent DHF, because DHF is transmitted by mosquitoes.	16 (9.09)	10 (5.68)	150 (85.23)	1.24	0.60	Low
18. It is time consuming to buy chemical sprays at stores.	84 (47.73)	32 (18.18)	60 (34.09)	2.14	0.90	Moderate
19. It is costly to take preventive methods against DHF.	67 (38.07)	15 (8.52)	94 (53.41)	1.85	0.95	Moderate

Table 10 Distribution of Respondents' Perceptions toward DHF and Preventive Behaviour (Cont.)

Statement	Disagree N (%)	Undecided N (%)	Agree N (%)	$\bar{X}$	SD	Comment
20. It is uncomfortable to wear long sleeve shirt to prevent mosquito bite.	74 (42.05)	27 (15.34)	75 (42.61)	1.99	0.92	Moderate
21. To use mosquito net during daytime is troublesome.	89 (50.57)	20 (11.36)	67 (38.07)	2.13	0.94	Moderate
22. Chemical spray causes bad smell.	58 (32.95)	8 (4.55)	110 (62.50)	1.70	0.93	Moderate

Low: 1-1.67, Moderate: 1.68-2.32, High: 2.33-3

4.1.4 Cues to Action

Concerning the sources of information about DHF and its preventive methods, nearly 90 percent of respondents got advice from someone, but 6.25 percent did not get any information from anyone. 83.74 percent received information from people who were currently working for health services (Table 12). The major advisor was health volunteers with 65.91 percent as shown in Table 15. 47.16 percent got information from doctors, and 36.93 percent got it from nurses. A family member was the main adviser in non-health professional group with 24.43 percent. The percentage of other sources of information such as friends and relatives was only 14.77 percent and 11.93 percent, respectively. 97.16 percent got information about DHF from more than 1 mass media, while only 2.84 percent of respondents had not received any information. Table 14 shows that the respondents got more information about DHF from printed materials (76.92%) than electronic materials (23.08%). A majority (60.80%) received information about DHF and preventive behaviour from

announcements. This was followed by TV (52.27%), brochure (43.18%), newspaper (21.02%), leaflet (19.32%) and radio (17.61%) as shown in Table 15.

Relating to the experience of DHF around migrants as shown in Table 16, nearly half of respondents (49.43%) said that there were DHF infected persons around them. 30.68 percent had no experience, and the remaining nearly 20 percent said they are not sure.

Table 11 Frequency and Percentage of the Advice from personnel about DHF

Cues to Action	**N= 176**	**%**
Advice from personnel		
From Health Personnel and Non-Health Personnel	42	23.86
From Health Personnel or Non-Health Personnel	123	69.89
From None of above	11	6.25

Table 12 Frequency and Percentage of the Respondents who received Advice from Health Personnel or Non-Health Personnel

Cues to Action	**N= 123**	**%**
Advice from personnel		
From Health Personnel	103	83.74
From Non-Health Personnel	20	16.26

Table 13 Frequency and Percentage of Information from Mass Media

Cues to Action	**N= 176**	**%**
Information from Mass Media		
From Electric Media and Printed Material	80	45.45
From Electric Media or Printed Material	91	51.71
From None of above	5	2.84

Table 14 Frequency and Percentage of the Respondents who received Information from Electric Media or Printed Material

Cues to Action	N= 91	%
Information from Mass Media		
From Electric Media	21	23.08
From Printed Material	70	76.92

Table 15 Frequency and Percentage of the Information from Person and Information from Media

Cues to Action	N	%
Advice from Personnel*		
Doctors	83	47.16
Nurses	65	36.93
Health Volunteers	116	65.91
Family Members	43	24.43
Relatives	21	11.93
Friends	26	14.77
Information from Mass Media*		
TV	92	52.27
Radio	31	17.61
Newspaper	37	21.02
Brochure	76	43.18
Leaflet	34	19.32
Announcement	107	60.80

* Multiple Answer

Table 16 Frequency and Percentage of DHF Patients around Migrants

Cues to Action	N= 176	%
DHF of the People around Migrants		
Yes	87	49.43
No	54	30.68
Not Sure	35	19.89

4.1.5 Preventive Behaviour

Table 17 shows preventive behaviour among respondents. Most respondents belonged to moderate and high level in preventive behaviour against DHF with 43.18 percent and 42.61 percent respectively. Only 14.21 percent reported that they had low level in preventive behaviour.

Table 17 Frequency and Percentage of the Level of Preventive Behaviour against DHF

Preventive Behaviour	N= 176	%
Level of Preventive Behaviour		
Low Level (0-7)	25	14.21
Moderate Level (8-13)	76	43.18
High Level (14-21)	75	42.61
Mean= 12.48 SD= 4.42 Min= 0.00	Max= 21.00	

Table 18 shows the frequency and percentage of preventive behaviour among respondents. Regarding mosquito nets, about 62 percent use it often (everyday) or sometimes (once a week). However, 32.95 percent replied that they had never used it, and only 5.11 percent rarely used it. 46.59 percent of the study group was largely used mosquito insecticide once a week, and about one fourth (26.14%) of respondent stated that they used it everyday. However, about 10 percent of them responded that they used it once a month or never used it. 46.02 percent of respondent picked up discarded water containers or objects around their houses to destroy

mosquito breeding sites once a week, and 28.98 percent of them picked it up everyday. Some of respondent (12.50%) picked it up once a month or never did. 40.34 percent of respondents changed the water, put abate sand or detergent in the water container once a week, and 35.23 percent took this preventive behaviour everyday. On the other hand, 14.77 percent of them had never done it, and less than 10 percent did it once a month. As for covering water jars immediately after use, 58.52 percent did, 18.75 percent of respondents had never done it, and 18.18 percent of them answered that they covered it immediately once a week. The remaining 4.55 percent did it once a month. 42.05 percent of respondents examined the mosquito larvae in water jars once a week, and 33.52 percent of them checked it every day. 14.20 percent had never inspected it, and 10.23 percent of them sifted it once a month. More than half of respondent (51.14%) had never checked for larvivorus fish, while 17.05 percent of them looked over them everyday, 20.45 percent once a week, and 11.36 percent once a month.

Table 18 Frequency and Percentage of the Respondents Related to Preventive Behaviour by Item Analysis

Preventive Behaviour against DHF	**Often** N (%)	**Sometimes** N (%)	**Rarely** N (%)	**Never** N (%)
Sleeping Net				
1 How often do you and your family members sleep in the mosquito net/screen in day time?	55 (31.25)	54 (30.68)	9 (5.11)	58 (32.95)
Mosquito insecticide				
2 How often do you use mosquito insecticide?	46 (26.14)	82 (46.59)	25 (14.20)	23 (13.07)

Table 18 Frequency and Percentage of the Respondents Related to Preventive Behaviour by Item Analysis (Cont.)

Preventive Behaviour against DHF	Often N (%)	Sometimes N (%)	Rarely N (%)	Never N (%)
Discarded water containers				
3 How often do you pick up discarded water containers or objects around your house to destroy mosquito breeding sites?	51 (28.98)	81 (46.02)	22 (12.50)	22 (12.50)
Change the water, put abate sand or detergent in the water container				
4 How often do you change the water, or put abate sand or detergent in the water container?	62 (35.23)	71 (40.34)	17 (9.66)	26 (14.77)
Water jar				
5 How often do you cover water jars immediately after use?	103 (58.52)	32 (18.18)	8 (4.55)	33 (18.75)
Mosquito larvae				
6 How often do you examine the mosquito larvae in your water jars?	59 (33.52)	74 (42.05)	18 (10.23)	25 (14.20)
Larvivorus fish				
7 How often do you check for larvivorus fish in the water containers?	30 (17.05)	36 (20.45)	20 (11.36)	90 (51.14)

Often: every day, Sometimes: once a week, Rarely: once a month, Never: do not do anything

Part Ⅱ: Association Between Independent Variables and Preventive Behaviour

4.2.1 Association Between Demographic Data and Preventive Behaviour

The results of the association between demographic variables and preventive behaviour are displayed in Table 19. More than half (53.85%) of middle age group had high preventive behaviour against DHF, and 11.54 percent had low level of preventive behavour. On the other hand, about 40 percent of young age group had high preventive practice, while low practice group of this age group was approximately 15 percent. There was therefore no statistically significant association between age group and preventive behaviour against DHF among respondents. (P-Value= 0.455).

Males were reported to have higher levels of prevention when compared to females. However, over half (50.60%) of females showed to have moderate levels of prevention, while 36.56 percent of males belong to this group. There was no significant association between gender and preventive behaviour (P-Value= 0.145).

A higher level of education was seen to affect preventive behaviour. A high level of preventive behaviour was seen amongst those who had high education with 57.14 percent. Interestingly enough, the highest level of prevention was seen amongst those who had received no formal education (66.67%) (Appendix A, Table 25). The study found that there was no statistical significance between preventive behaviour and educational levels (P-Value=0.548).

Concerning the individual income of the samples, 60.00 percent of the lower income group had a high level of preventive practice. Whereas about one third (37.04%) of the high income group had a high level of preventive behaviour, and 22.22 percent had a low level of practice (Appendix A, Table 25). There was no significant relationship between income and preventive behaviour. P-Value was 0.122. On the other hand, the relationship between duration of stay and preventive behaviour revealed a significant association (P-value= 0.013). The longer they stay, the worse the preventive behaviour.

Table 19 Association between Demographic Variables and Preventive Behaviour against DHF

Demographic Variables	Preventive Behaviour against DHF						χ^2	P-Value
	High		Moderate		Low			
	N	%	N	%	N	%		
Age Group								
15-29	61	40.67	67	44.67	22	14.67	1.574	0.455
30-49	14	53.85	9	34.62	3	11.54	df = 2	
Sex								
Male	43	46.24	34	36.56	16	17.20	3.86	0.145
Female	32	38.55	42	50.60	9	10.84	df = 2	
Educational Level								
< Lower Secondary	24	39.34	26	42.62	11	18.03	3.06	0.548
Lower Secondary	31	40.26	35	45.45	11	14.29	df = 4	
> Lower Secondary	20	52.63	15	39.47	3	7.89		
Income (Baht/month)								
< 5,300	55	45.08	54	44.26	13	10.66	4.20	0.122
≥ 5,300	20	37.04	22	40.74	12	22.22	df = 2	
Duration of Stay (month)								
< 36 months	43	51.81	34	40.96	6	7.23	8.68	**0.013***
≥ 36 months	32	34.41	42	45.16	19	20.43	df = 2	

* P-Value < 0.05

4.2.2 Association Between Knowledge and Preventive Behaviour

The association between knowledge and preventive behaviour is compared in Table 20. About one third of the study group (37.50%) who got more than 80 percent of score have a high level of preventive behaviour, and nearly half of low knowledge group (44.00%) had a high level of performance (Appendix A, Table 26). Therefore, there was no statistical correlation between knowledge and preventive behaviour against DHF among respondents. (P-value= 0.672)

Table 20 Association between Knowledge and Preventive Behaviour against DHF

Knowledge	**Preventive Behaviour against DHF**						χ^2	**P-Value**
	High		Moderate		Low			
	N	%	N	%	N	%		
Level of Knowledge								
≥ 60 percent	20	39.22	22	43.14	9	17.65	0.79	0.672
< 60 percent	55	44.00	54	43.20	16	12.80	df = 2	

4.2.3 Association Between Perception and Preventive Behaviour

Table 21 shows comparison between perceptions with preventive behaviour. The respondents who had moderate level of perception are likely to have a higher level of preventive behaviour against DHF. Whereas the majority of high perception group belonged to a moderate level of practice with 45.61 percent. In addition, a few percentage of study group had a low level of preventive behaviour in the moderate and high perceptions groups with 11.29 percent and 15.79 percent, respectively. The result shows that there was no statistically significant association between perception and preventive behaviour (P-Value= 0.326).

Table 21 Association between Perception and Preventive Behaviour against DHF

Perception	Preventive Behaviour against DHF						χ^2	P-Value
	High		Moderate		Low			
	N	%	N	%	N	%		
Level of Perception								
Moderate	31	50.00	24	38.71	7	11.29	2.24	0.326
High	44	38.60	52	45.61	18	15.79	df = 2	

4.2.4 Association Between Cues to Action and Preventive Behaviour

Tables 22, 23 and 24 showed the association between cues to action and preventive behaviour. There was statistical significance between getting advice from a doctor and respondents' preventive behaviour against DHF (P-value= 0.003) as shown in Table 22. Those who got advice from the doctors tend to take higher level of preventive behaviour. On the other hand, getting advice from nurses or health volunteers and preventive behaviour were not correlated.

Table 22 also showed that getting advice from family members and preventive behaviour were correlated (P-value= 0.029). However, there was no significant association between getting advice from others (relatives and friends) and preventive behaviour among respondents.

Out of 6 sources in media, only TV was found to be significantly associated with preventive behaviour against DHF (P-value= 0.043). However, there was no significance between getting others; radio, newspaper brochure, leaflet and announcement and preventive behaviour.

There was significant association between the illness of family members or friends and preventive behaviuor against DHF among respondents. (P-value= 0.007) The respondents with DHF around them tend to have a high level of preventive behaviour against DHF.

Table 22 Association between Source of Information by Person and Preventive Behavior against DHF

Cues to Action	Preventive Behaviour against DHF						χ^2	P-Value
	High		Moderate		Low			
	N	%	N	%	N	%		
Doctors								
-received	41	49.40	38	45.78	4	4.82	11.68	**0.003***
-not received	34	36.56	38	40.86	21	22.58	df = 2	
Nurses								
-received	27	41.54	30	46.15	8	12.31	0.50	0.779
-not received	48	43.24	46	41.44	17	15.32	df = 2	
Health Volunteers								
-received	50	43.10	54	46.55	12	10.34	4.48	0.106
-not received	25	41.67	22	36.67	13	21.67	df = 2	
Family Members								
-received	11	25.58	23	53.49	9	20.93	7.09	**0.029***
-not received	64	48.12	53	39.85	16	12.03	df = 2	
Relatives								
-received	11	52.38	8	38.10	2	9.52	1.04	0.593
-not received	64	41.29	68	43.87	23	14.84	df = 2	
Friends								
-received	9	34.62	11	42.31	6	23.08	2.15	0.341
-not received	66	44.00	65	43.33	19	12.67	df = 2	

Table 23 Association between Source of Information by Mass Media and Preventive Behaviour against DHF

Cues to Action	Preventive Behaviour against DHF						χ^2	P-Value
	High		Moderate		Low			
	N	%	N	%	N	%		
TV								
-received	38	41.30	46	50.00	8	8.70	6.27	**0.043***
-not received	37	44.05	30	35.71	17	20.24	df = 2	
Radio								
-received	18	58.06	10	32.26	3	9.68	3.69	0.158
-not received	57	39.31	66	45.52	22	15.17	df = 2	
News paper								
-received	18	48.65	17	45.95	2	5.41	3.04	0.219
-not received	57	41.01	59	42.45	23	16.55	df = 2	
Brochure								
-received	27	35.53	36	47.37	13	17.11	2.91	0.233
-not received	48	48.00	40	40.00	12	12.00	df = 2	
Leaflet								
-received	19	55.88	13	38.24	2	5.88	4.04	0.133
-not received	56	39.44	63	44.37	23	16.20	df = 2	
Announcement								
-received	46	42.99	46	42.99	15	14.02	0.02	0.991
-not received	29	42.03	30	43.48	10	14.49	df = 2	

* P-Value < 0.05

Table 24 Association between Experience which Respondent had DHF Patient and Preventive Behaviour against DHF

Cues to Action	Preventive Behaviour against DHF						χ^2	P-Value
	High		Moderate		Low			
	N	%	N	%	N	%		
Yes	46	52.87	27	31.03	14	16.09	14.22	**0.007***
No	15	27.78	34	62.96	5	9.26	df = 4	
Not Sure	14	40.00	15	42.86	6	17.14		

* P-Value < 0.05

CHAPTER 5
DISCUSSION

This cross sectional study was designed to explore the factors related to the preventive behaviour against DHF among migrants in Muang District, Samut Sakhon province, Thailand. A total of 201 migrants ranged from 15 to 65 years old were interviewed by 10 trained interviewers. Out of 201 responses, 176 were used for analysis. The remaining were discarded for missing data. This study focused on the socio-demographic variables, knowledge, perception, cues to action as independent variables and preventive behaviour on DHF of migrants as a dependent variable.

5.1 Socio-Demographic Variables

5.1.1 Age

The outcome of this study revealed that the percentage of each level of preventive behaviour between age groups was similar. Therefore, there was no statistical association between age and preventive behaviour. This study got similar results with the study of Somchai T. [42], Phan Quan [37], however, it was different from Susilowati A. [41], and Tran Ngoc Huu [38]. It might be because the research was conducted at different counties and with different target group.

5.1.2 Sex

Concerning gender, it was found that high percentage of males had a higher level of preventive behaviour rather than females, 46.24 percent and 38.55 percent respectively. On the other hand, 50 percent of females had a moderate level compared to 36.56 percent of males. However, no correlation was found between sex and preventive behaviour. This result corresponds to the research of Somchai T. [42] and Phan Quan [37].

5.1.3 Education

Regarding educational background of the studied population, majority of respondents had completed lower secondary education (43.75%) and elementary education (32.95 %). 1.70 percent did not receive any education. More than half of the upper secondary education and highest education group did high level preventive behaviour with 51.61 percent and 57.14 percent respectively. It is probably because they have more knowledge about DHF and its prevention. They may know more about health matters and prevention [39]. Around 45 percent of respondents who finished elementary and lower secondary education ranked in moderate level of preventive behaviour. Surprisingly, two thirds of uneducated group (66.67%) had high preventive behaviour. It could be because the low educated group can not earn a high income, so they live in a house with no net on the windows and no well-maintained infrastructures, and the living area is supported by mobile care unit that provides preventive DHF campaigns to the habitants. Therefore, they may be aware how to prevent themselves from getting DHF. There was no correlation between educational level and preventive behaviour against DHF. It was the same result as Somchai T. [42], Phan Quan [37] and Tran Ngoc Huu [38].

5.1.4 Income

60 percent of the low income group had high preventive practice, and none of them had low level performance. Conversely, more than one-third of high earnings group (37.04%) acted with a high level of preventive behaviour, and 22.22 percent had low practice. This situation can be explained by above reason in education part. Income and preventive behaviour were not associated. This consequence fits with the result of the study of Somchai T. [42].

5.1.5 Duration of Stay

Duration of stay is one important factor to consider migrants' preventive behaviour against DHF. The result of the study showed that nearly 50 percent of respondents who lived in Muang District less than 36 months (3 years) acted with a high level of preventive behaviour, and less than 8 percent had a low level of practice. On the other hand, 30 percent had high performance in the long stay group (more than

120 months), but 30 percent of them had low level of preventive behaviour. This result shows that the longer respondents staying in Samut Sakhon took the lower level of preventive behaviour. It presumably short stay group does not have enough money to live trim house. Thus, they need to take high preventive measures against DHF because they stayed in the house without any net on the window or maintenance of infrastructures. There was a correlation between duration of stay and preventive behaviour.

5.2 Knowledge

Concerning the knowledge of the respondents, this study revealed that a majority of respondents (71.02%) got under 60 percent of the score. Only 4.55 percent of them had a high level of knowledge. The proportion of respondents in the high knowledge part in this study is lower than the result of Hmwe Hmwe Kyu [36]. It showed that 44 percent of sample had a high level of knowledge, and 42 percent had moderate level of knowledge. Only 14 percent of respondents belonged to low level of knowledge, which is less than 40 percent. One possibility of the lower proportion in the study is that respondents might not be sufficiently exposed to the campaigns from provincial health office, because nearly 50 percent of them stayed in Muean Samut Sakhon less than 3 years. Another reason might be that they can not understand Thai well, so the effect of campaign might be less on them. In this study, more than one third of high knowledge group (37.50%) took high preventive measure, and 44 percent of low knowledge group also had high level of performance. While, 37.50 percent of the respondent who got above 80 percent score belonged to low level of practice, and 12.80 percent of respondents who had less than 60 percent occupied low performance. Therefore, there was no correlation between knowledge and preventive measure, and the result was the same as Somchai T. [42] and Hairi F [45]. However, there were different conclusions in the work of B. H. B. van Benthem [40], Susilowati A. [41], Phan Quan [37] and Tran Ngoc Huu [38]. They showed that the more respondents had knowledge about DHF, the more they took preventive practices compared with the samples without knowledge. The reason for this is that low knowledge group might have low educational background, so they may gain low

income. Therefore, they need to live in the house without any screens on the window and well-maintained infrastructures. Thus, they might need to take high preventive measure, such as using a mosquito net and covering water jars to protect themselves against DHF.

This study also revealed that most respondents knew *Ae. aegypti* transmits DHF, and avoiding mosquito bite is the most suitable method to prevent DHF with 67.05 percent and 76.14 percent. The effect of the information tools, such as health volunteers, TV and announcements. This study was supported by the work of Hmwe Hmwe Kyu [36] and Swaddiwudhipong W. [47]. While, only 19.89 percent of respondents got a correct answer about the symptom of DHF. However, this question might be too scientific for this target group. The result about the knowledge concerning the treatment of DHF was less mentioned in this study. Then it meant that the respondent do not have good knowkedge on the treatment of DHF. Therefore, this was different from Somchai's work [42].It might be because there is no description about treatment in the leaflet which is distributed at the mobile clinic.

5.3 Perception

Considering the investigation of perception against DHF among respondents, it discovered that nearly two third of them (64.77%) had high perception, and 35.23 percent was in moderate level of perception. Among respondents who had high level of perception, over one third (38.6%) had high preventive behaviour, and among respondents who had low perception, half of them had high level of preventive behaviour. The result also showed that there was no statistical association existed. The findings of this study were different to the survey of Tran Ngoc Huu [38]. It showed that there was a correlation between perception and preventive bahviour. The reason for the difference may be because the target groups of these researches were different.

This survey showed that less than half of respondents (45.45%) agreed that sharing glasses, dishes and towels with DHF patients will not get disease. Thus, this result is close to the outcome of Peter J (38.6%) [49]. The overall result in barriers

part also showed that respondents perceived barriers to control DHF and take the prevention against DHF. It might be because their low knowledge level influences it. Other two reasons for this are that DHF is very close existence for respondents' daily life. Because it is transmitted by mosquitoes, and respondents also perceived that taking preventive behaviour against DHF is costly, and chemical spray causes bad smell. These might be the reasons that respondents do not to take prevention.

5.4 Cues to Action

5.4.1 Advice from Health Personnel and Information from Mass Media

The main sources of information for migrants in Muang District were health volunteers and announcements. The reason why respondents frequently get information from these two sources may be that health volunteers were chosen from migrants. Therefore, there is possibly close relationship between the migrants and health volunteers. Another feasible reason is that there is no language barrier between them because they came from the same countries. On the other hand, if the respondents received information about DHF from TV or radio, they might not understand Thai language well. The reason to support announcements was that it can be used in prominent places, such as a side of a road and in the mobile clinic that are easy to catch the information. The outcome of this study differs from Gupta P [48], Hairi F [45] and Swaddiwudhipong W. [47] who reported that audiovisual media was a common source to gain information and were effective media, and the result of Hmwe Hmwe Kyu [36], that showed the major sources of information: family members, friends and neighbors. However, there is a result supported by Somchai's work [42]. In which announcements were frequently used to obtain the information.

5.4.2 DHF of the People around Migrants

In terms of the experience which migrants had DHF patients around them, nearly half of respondents (49.43%) opined that they have known people infected with DHF. There was a correlation between the experience of it and preventive behaviour of the studied group. The respondents who had an experience of having DHF patients around them took higher level of preventive behaviour. This fact

corresponds to the study of Kittigul L. [44] and Susilowati A. [41]. This happened because the respondents who had this experience might tend to be concerned about DHF and its prevention. The respondents who had this experience might get some more knowledge about DHF from contacting DHF patients.

5.5 Preventive Behaviour

42.61 percent of respondents had high level of preventive behaviour. This result is better than Hmwe Hmwe Kyu's [36] finding of 29 percent who had good practices. The possible reasons of this are that the effect of campaigns from the provincial health office and ample numbers of health volunteers. Another practical reason for this is that the respondents need to take high preventive behaviour because they might live in houses with no screens on the windows and the infrastructures might not be maintained. It also revealed that the most popularly used preventive method was to cover water container with 58.52 percent. It was a common practice in the survey of Swaddiwudhipong W. [47] and Hmwe Hmwe Kyu [36]. This preventive method might be frequently used due to simple and easy of usage, and not costly. However, Tran Ngoc Huu [38] reported that high proportion of respondent did not cover any containers. Changing the water, putting abate sand or detergent in the water containers were the second often used methods with 35.23 percent in this study. Swaddiwudhipong W. [47] also reported that these were the general method, whereas this method was used by only 8.8 percent of respondents in the study of Hmwe Hmwe Kyu [36].

Only 17.05 percent of respondents used larvivorus fish in this study, but a high proportion (47.1%) used this method in the research of Tran Ngoc Huu [38]. It is perhaps because using fish is not suitable method for migrants because they are not permanent habitants.

CHAPTER 6
CONCLUSION AND RECOMMENDATION

6.1 Conclusion

DHF is nowadays a worldwide concern and a serious infectious disease in tropical and sub-tropical areas. Thailand is one of the countries which is most seriously affected by DHF. Samut Sakhon is located in central Thailand, and it is a province which has a high prevalence rate of DHF and large population of migrants. Therefore, an attempt was made to explore the factors related to preventive measures against DHF among migrants in Muang District, Samut Sakhon in Thailand.

This study has highlighted some of the factors related to the preventive practice among migrants in Muang Samut Sakhon. The major countermeasure among the studied population was covering water containers. Changing the water, putting abate sand or detergent in water containers were secondary. On the other hand, larvivorus fish were less used among respondents. The study found that the percentage of low preventive measures was higher among four groups, namely males, no education, high income and long stay groups. The outcome also indicated that most respondents had a low level of knowledge, especially low in the treatment statements. Interestingly, the low knowledge group performed high preventive behaviour more than the high knowledge group, and the majority of samples had high perception. However, only 45.45 percent agreed that sharing glasses, dishes and towels with DHF patients will not get disease. Moreover, this study discovered that respondents perceived barriers to controlling DHF and taking preventive behaviours. The respondents are likely to get guidance about DHF from health personnel and printed materials. Health volunteers take a leading role, followed by announcements and TV as common information tools. An association was found between duration of stay and preventive behaviour. The longer respondents stay in Samut Sakhon, the lower practice they took. A correlation was also found between getting advice from

doctors and preventive measure. The respondents who received advice from doctors are likely to take high level of preventive practice. There were associations between getting information from family members and TV and preventive behaviour, too. Furthermore, there was a correlation between illness of the people around migrants and preventive measure. The samples who had experienced DHF patients around them tended to have high preventive practice.

6.2 Recommendation

6.2.1 Recommendation for Implementation

On the basis of the findings of this study the following recommendations can be made:

1. The government staff or NGOs related to DHF control should pay attention to the migrant workers who stay long in Muang District Samut Sakhon, because they tend to perform low preventive measures against DHF.
2. The government staff or NGOs related to DHF control need to deliver the information about DHF to migrants. Migrant health volunteers perform a very important function, then announcements are also recommended for migrants because most of respondents gain information from them. The guidance from the other sources, such as doctors and TV, about DHF for migrants should be strengthened, because the study showed that they are correlated between preventive behaviour and some of the variables.

6.2.2 Recommendation for Further Study

The recommendations from this survey are described for further research in the future.

1. It might be wise to conduct the survey during the rainy season, because recognition of migrants towards DHF preventive measures might be different during DHF epidemic seasons and dry seasons.
2. Environmental observation should be taken as one of the variables because it is possible to interpret the real situation of preventive behaviour.

3. A combination of quantitative and qualitative study will be worthwhile to detect the elements allied to preventive measures against DHF among respondents more precisely.
4. Further prospective studies are recommended in terms of movement pattern of this population in this area and to grasp transference of cognitions and preventive behaviour among migrants. It will help to comprehend the actual circumstances of migrants more deeply and accurately.

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APPENDIX

APPENDIX A
TABLES

Table 25 Percentage Distribution between Demographic Variables and Preventive Behaviour against DHF

Demographic Variables	**Preventive Behaviour against DHF**					
	High		**Moderate**		**Low**	
	N	**%**	**N**	**%**	**N**	**%**
Educational Level						
No education	2	66.67	0	0.00	1	33.33
Elementary Education (Grades 1-6)	22	37.93	26	44.83	10	17.24
Lower Secondary Education (Grades 7-9)	31	40.26	35	45.45	11	14.29
Upper Secondary Education (Grades 10-12)	16	51.61	12	38.71	3	9.68
Higher Education	4	57.14	3	42.86	0	0.00
Income (Baht/month)						
≤2,700	6	60.00	4	40.00	0	0.00
2,701-5,299	49	43.75	50	44.64	13	11.61
≥5,300	20	37.04	22	40.74	12	22.22
Duration of Stay (month)						
<36	43	51.81	34	40.96	6	7.23
36-120	30	34.48	40	45.98	17	19.54
>120	2	33.33	2	33.33	2	33.33

Table 26 Percentage Distribution between Knowledge and Preventive Behaviour against DHF

Knowledge	**Preventive Behaviour against DHF**					
	High		Moderate		Low	
	N	%	N	%	N	%
Level of Knowledge						
High level (>80%)	3	37.50	2	25.00	3	37.50
Moderate level (60-80%)	17	39.53	20	46.51	6	13.95
Low level (<60%)	55	44.00	54	43.20	16	12.80

APPENDIX B

QUESTIONNAIRES (ENGLISH VERSION)

Questionnaire

Title: Factors related to preventive behaviour against dengue hemorrhagic fever among migrants in Muang district, Samut Sakhon province, Thailand.

ID No.

The target group of this research is the migrant workers who is the age from 15 to 65 years old.

Please answer all of the questions.

This questionnaire will be used only to analyse the data, and this will not be used the other any purpose. Your personal information will be closely deal with.

Thank you.

Part 1: Demographic Variables

Please answer or mark in the ( ) with a ✓.

1 Age ・・・ _____ years old

2 Gender ( ) Male

( ) Female

3 Education level

( ) No education

( ) Primary School (Grades 1, 2, 3, 4, 5, 6)

( ) Secondary School (Grades 7, 8, 9)

( ) High School (Grades 10, 11, 12)

( ) Higher Education

4 Individual Income ・・・ _____ Baht/month

5 How long do you stay in Samut Sakhon? _____ year _____ month

Part 2: Knowledge about dengue hemorrhagic fever (DHF) and preventive behaviour

Please check the answer in the blank column that you think the most suitable answer.

1 When is the most DHF epidemic season?

( ) dry season ( ) rainy season

( ) all seasons ( ) none of above

2 Which is the cause of DHF?

( ) virus ( ) bacteria ( ) fungus ( ) parasite

3 What kind of mosquito transmits DHF?

( ) Anopheles ( ) Aedes aegypti

( ) Culex ( ) Tiger mosquito

4 When is the biting time of the mosquito which causes DHF?

( ) night time ( ) day time

( ) morning ( ) afternoon

5 Which answer is the symptom of DHF?

( ) fever which continues more than 3 days

( ) continue high fever

( ) continue slight fever

( ) an acute biphasic fever

6 Which one is the **Wrong** answer about treating your child who gets DHF in your house?

( ) cooling ( ) hospitalization

( ) taking paracetamol ( ) taking aspirin

7 Which vaccine can prevent DHF?

( ) BCG ( ) DPT vaccine

( ) MMR vaccine ( ) No vaccine

8 Which method is the most suitable to prevent DHF?

( ) avoiding contact to DHF patient

( ) avoiding mosquito bites

( ) avoiding flies perch on meal

( ) avoiding sex with DHF patient

9 When a mosquito net should be used to prevent DHF?

( ) night time ( ) daytime

( ) evening ( ) all of above

10 Where is the mosquito's breeding sites?

( ) river ( ) canal

( ) rice field ( ) water containers in toilets and ant-traps

11 Which one is the **WRONG** answer to control mosquito larvae in water containers?

( ) drop small fish

( ) clean up water container periodically

( ) cover tightly on water container

( ) leave water container without changing water

Part 3: Perception on DHF and preventive behaviour

Please check the answer in the blank column that you think the most suitable answer.

Statement	Disagree	Undecided	Agree
Susceptibility			
1. Children and adults easily infected with DHF.			
2. Everyone has an opportunity to be infected by DHF.			
3. Even if infected with DHF before, you still have a chance to get infected again.			
4. You have a chance infected DHF if you stay in dark and wet places.			
5. You have more chance to get DHF when you have a DHF patient in your house.			
6. Sharing glasses, dishes and towels with DHF patients will not disease.			
7. Sleeping in mosquito nets can prevent you and your family members from being infected with DHF.			
Seriousness			
8. DHF is a serious health problem.			
9. DHF often causes death to children.			
10. DHF may have a serious impact on health expenditures.			
11. It is difficult to give effective treatment to cure DHF when children get the disease.			
Benefits			
12. Taking preventive methods against DHF will greatly reduce the number of cases.			

13. To take preventive behaviour reduces your anxiety of DHF.			
14. To take preventive behaviour increases your quality of life.			
15. The prevention of DHF helps you to save money.			
16. It does not take a time to take care of a DHF patient in your household.			
Barriers			
17. It is difficult to prevent DHF, because DHF is transmitted by mosquitoes.			
18. It is time consuming to buy chemical sprays at stores.			
19. It is costly to take preventive methods against DHF.			
20. It is uncomfortable to wear long sleeve shirt to prevent mosquito bite.			
21. To use mosquito net during daytime is troublesome.			
22. Chemical spray causes bad smell.			

Part 4: Cues to Action

Please check the answer in the plank column that you think the most suitable answer.

1 Have your family members, relatives or friends ever been infected by DHF?

( ) Yes ( ) No ( ) Not Sure

2 Who did give you the information or advice about DHF and its prevention and control? 【**Multiple Answer**】

( ) Doctor ( ) Nurse ( ) Health Volunteer

( ) Family Member ( ) Relatives ( ) Friends

( ) None

3 Which mass media do you normally get the information about DHF? Please check the answer in the blank column. **【Multiple Answer】**

( ) TV ( ) radio ( ) news paper

( ) brochure ( ) leaflet ( ) announcement

Part 5: Preventive Behaviour

Please check the answer in the plank column that you think the most suitable answer.

Often: If you use the preventive method every day.

Sometimes: If you use the preventive method once a week.

Rarely: If you use the preventive method once a month.

Never: If you have never used the preventive method.

1 How often do you and your family members sleep in the mosquito net/screen in day time?

( ) Often ( ) Sometimes ( ) Rarely ( ) Never

2 How often do you use mosquito insecticide?

( ) Often ( ) Sometimes ( ) Rarely ( ) Never

3 How often do you pick up discarded water containers or objects around your house to destroy mosquito breeding sites?

( ) Often ( ) Sometimes ( ) Rarely ( ) Never

4 How often do you change the water, or put abate sand or detergent in the water container?

( ) Often ( ) Sometimes ( ) Rarely ( ) Never

5 How often do you cover water jars immediately after use?

( ) Often ( ) Sometimes ( ) Rarely ( ) Never

6 How often do you examine the mosquito larvae in your water jars?

( ) Often ( ) Sometimes ( ) Rarely ( ) Never

7 How often do you check for larvivorus fish in the water containers?

( ) Often ( ) Sometimes ( ) Rarely ( ) Never

APPENDIX C
QUESTIONNAIRES
(THAI AND BURMESE VERSION)

แบบสอบถาม

စုံစမ်းမေးမြန်းချက်

เรื่อง

ปัจจัยที่เกี่ยวข้องกับพฤติกรรมป้องกันโรคไข้เลือดออกในผู้อพยพ

ในอำเภอเมือง จังหวัดสมุทรสาคร ประเทศไทย

ရွှေ့ပြောင်းအလုပ်သမားများ၌သွေးလွန်တုပ်ကွေးရောဂါနှင့်ပတ်သက်သောကာကွယ်မှုဆိုင်ရာအချက်အလက်များ

ထိုင်းနိုင်ငံ စမွတ်ဆာခွန်ခရိုင် မောဘချိုင်းမြို့

....

กลุ่มตัวอย่างในการศึกษาครั้งนี้ได้แก่กลุ่มผู้ที่อพยพที่ใช้แรงงานอายุ 15 ถึง 65 ปี

ရွှေ့ပြောင်းအလုပ်သမားများအတွင်းအသက် ၁၅ မှ ၆၅ နှစ်ထိစံပြတုပ်စုအဖြစ်သုတေသီပြုလုပ်ဆောင်ရွက်ခြင်း။

คำชี้แจง กรุณาตอบคำถามทุกข้อ แบบสอบถามนี้จะนำมาใช้เพื่อการศึกษาเท่านั้นและข้อมูลทั้งหมดจะไม่ถูกนำไปใช้นอกเนื่องจาก การศึกษา ข้อมูลส่วนบุคคลจะไม่มีการเปิดเผยต่อบุคคลหนึ่งบุคคลใดโดยเด็ดขาด ขอขอบคุณที่ให้ความร่วมมือในการตอบแบบสอบถาม

ရှင်းလင်းတင်ပြချက်၊ စုံစမ်းမေးမြန်းချက်မေးခွန်းအားလုံးဖြေဆိုသွားစေရန်ဤအချက်အလက်များပညာရေးသုတေသနအတွက်သာ ဖြစ်၍ပုဂ္ဂိုလ်တစ်ဦးအနေဖြင့်ဖြေဆိုသောအကြောင်းအရင်းများအခြားတစ်ယောက်ထံသို့ဖွင့်ဟပြောဆိုခြင်းမရှိစေရပါ၊ကျေးဇူးပြု၍ မေးခွန်းအားလုံးဖြေဆိုပေးပါသည်။

ส่วนที่ 1. ข้อมูลด้านประชากร

အပိုင်း ၁ လူထုဆိုင်ရာအချက်များ

กรุณาตอบคำถามในช่องว่างหรือใส่เครื่องหมาย ✓ ลงในช่อง ( )

ကျေးဇူးပြု၍ဖြေဆိုချက်များကိုကွင်းငယ်တွင်း၌( )အမှန်အမှတ်သားဖြစ်စေရန်

1. อายุ ___ ___ ปี

၁၊အသက် နှစ်

2. เพศ ( ) ชาย ( ) หญิง

၂၊ လိင် ( ) ကျား ( ) မ

3. ระดับการศึกษา ( ) ไม่ได้รับการศึกษา

၃၊ပညာအရည်အချင်း ( )ကျောင်းမနေ

( ) ประถมศึกษา (ป.1-ป.6)

( ) မူလတန်း

( ) มัธยมศึกษาตอนต้น (ม.1-ม.3)

( ) အလယ်တန်း

( ) มัธยมศึกษาตอนปลาย (ม.4-ม.6)

( ) အထက်တန်း

( ) การศึกษาชั้นสูง (ปวส./อนุปริญญา/ปริญญาตรี)

အဆင့်မြင့်ပညာ (တက္ကသိုလ်ဝင်၊ဘွဲ့ကြို၊ဘွဲ့ရ)

4. รายได้ของคุณต่อเดือน ________ ________ บาท

၄၊လူကြီးမင်းတစ်လဝင်ငွေ ဘတ်

5.คุณอาศัยอยู่ในสมุทรสาครได้นานเท่าใดแล้ว.........................ปี.................เดือน

၅၊လူကြီးမင်းစမွတ်ဆာခွန်၌ဘယ်လောက်ကြာအောင်နေထိုင်ခဲ့သည် နှစ် လ

รหัส ....

ส่วนที่ 2: ความรู้เกี่ยวกับโรคไข้เลือดออกและพฤติกรรมป้องกันโรค

အပိုင်း ၂ သွေးလွန်တုပ်ကွေးရောဂါနှင့်ပတ်သက်သောနားလည်သိတတ်မှုကာကွယ်နည်းအမျိုးမျိုး

กรุณาตอบคำถามโดยใส่เครื่องหมาย ✓ ลงในช่อง ( ) ตามที่คิดว่าถูกต้อง

မေးခွန်းများကိုမိမိကိုယ်ပိုင်အတွေးနှင့်ဖြေဆိုချက်များကိုကွင်းငယ်တွင်အမှန်အမှတ်သားခြစ်၍ဖြေဆိုရန်

1.ฤดูที่ไข้เลือดออกระบาดมากที่สุด

၁။ သွေးလွန်တုပ်ကွေးရောဂါကူးစက်မှု အများဆုံးဖြစ်သည့်အချိန်ရာသီမှာ

( ) ฤดูแล้ง နွေရာသီ ( ) ฤดูฝน မိုးရာသီ ( ) ทุกฤดู ရာသီမရွေး ( )ไม่มีคำตอบที่ถูกต้อง ဘယ်အချက်မျှမမှန်ပါ။

2.อะไรเป็นสาเหตุทำให้เป็นโรคไข้เลือดออก

၂။ သွေးလွန်တုပ်ကွေးရောဂါဖြစ်ပေါ်စေသည့်ပိုးအမည်နှင့်အကြောင်းအရင်းမှာ

( ) เชื้อไวรัส ဗိုင်းရပ်(စ်) ( ) แบคทีเรีย ဘက်တီးရီးယား ( ) เชื้อรา မှိုအမျိုးမျိုး ( )พยาธิ သန်ကောင်

3. ยุงชนิดใดที่เป็นพาหนะนำโรคไข้เลือดออก

၃။ ဘယ်သောခြင်ကသွေးလွန်တုပ်ကွေးရောဂါဖြစ်စေသည့်ရောဂါပိုးသယ်ဆောင်လာသသလဲ?

( )ยุงก้นปล่อง ဖင်ကော့ခြင် ( ) ยุงลาย ခြင်ကျား ( ) ยุงไข้สมองอักเสบ ဦးနှောက်အမြှေးပါးရောင်ခြင် ( )သောခြင်ကျား

4. ยุงที่เป็นพาหนะนำโรคไข้เลือดออกจะกัดในช่วงเวลาใด

၄။ သွေးလွန်တုပ်ကွေးရောဂါဖြစ်စေသည့်ပိုးသယ်ဆောင်လာသောခြင်သည်ဘယ်အချိန်၌လူတွေကိုကိုက်ပါသလဲ?

( ) กลางคืน ညအချိန် ( ) กลางวัน နေ့ခင်းအချိန် ( ) ช่วงเช้า မနက်ခင်းအချိန် ( )ช่วงบ่าย မွန်းလွဲအချိန်

5. อาการในข้อใดเป็นอาการของโรคไข้เลือดออก

၅။ ဘယ်အချက်ကသွေးလွန်တုပ်ကွေးရောဂါလက္ခဏာ၏အချက်ဖြစ်ပါသလဲ?

( ) เป็นไข้นานกว่า 3วัน အဖျား ၃ ရက်ဆက်တိုက်တက်ခြင်း ( ) เป็นไข้สูงต่อเนื่อง အဖျားဆက်တိုက်ပြင်းထန်တက်ခြင်း

( ) เป็นไข้ต่ำต่อเนื่อง အဖျားဘာအားဆိုးကျခြင်း

( ) เป็นไข้ขึ้นๆ ลงๆ แบบเฉียบพลัน အဖျားတက်လိုက်/ကျလိုက်ဖြစ်၍ခဏခဏကျန်စေခြင်း။

6. คำตอบในข้อใดเป็นวิธีที่ผิดเมื่อรักษาเด็กที่เป็นโรคไข้เลือดออกในบ้านของคุณ

၆။ ဘယ်အချက်၌သင်၏အိမ်တွင်ကလေးငယ်သွေးလွန်တုပ်ကွေးရောဂါဖြစ်၍ကုသရာတွင်မှားသောအချက်ဖြစ်ပါသလဲ?

( ) ลดอุณหภูมิ အပူချိန်လျှော့ခြင်း ( ) เข้าโรงพยาบาล ဆေးရုံသွားတက်ခြင်း ( ) ทานยาลดไข้พาราเซตามอล ပါရာစီတမောအပူကျဆေးသောက်ခြင်း။ ( ) ทานยาลดไข้แอสไพริน အက်စ်ပိရင်အပူကျဆေးသောက်ခြင်း

7. วัคซีนใดที่สามารถป้องกันโรคไข้เลือดออก

၇။ သွေးလွန်တုပ်ကွေးရောဂါကိုဘယ်ကာကွယ်ဆေးကကာကွယ်နိုင်သလဲ?

( ) บีซีจี ဘီစီဂျီ ( ) วัคซีนดีพีที ဒီပီတီကာကွယ်ဆေး ( ) วัคซีนเอมเอมอาร์ အမ်အမ်အာကာကွယ်ဆေး

( )ไม่มีวัคซีนကာကွယ်ဆေးမရှိပါ

8. วิธีใดเหมาะสมที่สุดในป้องกันโรคไข้เลือดออก

၈။ ဘယ်နည်းက သွေးလွန်တုပ်ကွေးရောဂါကာကွယ်ဖို့ သင့်တော်ဆုံးလဲ?

( ) หลีกเลี่ยงในการสัมผัสผู้ป่วยไข้เลือดออก သွေးလွန်တုပ်ကွေးရောဂါသည်များနှင့်ထိတွေ့မှုကိုရှောင်ကြဉ်ရန်၊

( ) หลีกเลี่ยงจากถูกยุงกัด ခြင်ကိုက်ခြင်းမှရှောင်ကြဉ်စေရန်၊

( ) ระวังมิให้ยุงตอมอาหาร ခြင်များအစားအစာများအပေါ်မနားမနေစေရန်၊

( ) หลีกเลี่ยงในการมีเพศสัมพันธ์กับผู้ป่วยไข้เลือดออก

သွေးလွန်တုပ်ကွေးရောဂါသည်များနှင့်လိင်ဆက်ဆံမှုကိုရှောင်ကြဉ်ရန်၊

9. เมื่อใดเป็นเวลาที่ควรใช้มุ้งกันยุงเพื่อป้องกันโรคไข้เลือดออก

၉။ သွေးလွန်တုပ်ကွေးရောဂါကာကွယ်ဖို့ ဘယ်အချိန်၌ခြင်ထောင် ထောင်အိပ်သင့်ပါသလဲ?

( ) ตอนกลางคืน ညအချိန်၌( ) ตอนกลางวันနေ့လယ်နေ့ခင်း( ) ตอนหัวค่ำ ညဦးပိုင်း( ) ทุกเวลาအချိန်မရွေး/အချိန်တိုင်း

รหัส ....

10.ที่ใดเป็นแหล่งเพาะพันธุ์ยุง
၁၀။ဘယ်နေရာ၌ခြင်ပေါက်ပွါးရာနေရာဖြစ်ပါသနည်း
( ) แม่น้ำ မြစ်   ( ) คูคลอง ချောင်း မြောင်း ( ) นาข้าว လယ်တော
( ) อ่างน้ำในห้องน้ำและถ้วยน้ำดักมด ဇိမ်ခံသာ့ရှိရေကန်နှင့်ပုရွက်ဆိတ်တားရေခွက်

11.วิธีใดเป็นวิธีที่ผิดในการควบคุมลูกน้ำยุงลายในแหล่งน้ำ
၁၁။ခြင်ပေါက်ပွါးနေရာတွင်ပိုးလောက်လန်းထိန်းသိမ်းမှုဘယ်အချက်မှားပါသလဲ?
( ) ใส่ปลาขนาดเล็ก ငါးသေးသေးထည့်မွေးထားခြင်း။
( ) ทำความสะอาดแหล่งน้ำบ่อยครั้ง ရေဝပ်သောနေရာ၌မကြာခဏသန့်ရှင်းရေးပြုလုပ်ခြင်း။
( ) ปิดอ่างน้ำให้สนิท ရေအိုးရေပုံးများအဖုံးအလုံပိတ်ခြင်း
( ) ปล่อยแหล่งน้ำไว้โดยไม่ต้องเปลี่ยนน้ำ ရေအိုင်ရေဇပ်များကိုရေစီးဆင်းမှုမရှိပဲဒီအတိုင်းထားခြင်း

ส่วนที่ 3: การรับรู้เกี่ยวกับโรคไข้เลือดออกและพฤติกรรมป้องกันโรค
အပိုင်း ၃ သွေးလွန်တုပ်ကွေးရောဂါနှင့်ဝင်သက်သောအကာအကွယ်ဆောင်ရွက်နည်းအမျိုးမျိုး
กรุณาตอบคำถามโดยใส่เครื่องหมาย ✓ ลงในช่องว่างที่ตรงกับความคิดของท่านมากที่สุด
ကျေးဇူးပြုပြီးမိမိကိုယ်ပိုင်အတွေးနှင့်ဖြေဆိုချက်များကိုကွင်းငယ်တွင်ထဲ၌( )အမှန်အမှတ်သားဖြစ်၍ဖြေဆိုရန်

ข้อความ အကြောင်းအမျိုးမျိုး	ไม่เห็นด้วย မယုံကြည်ပါ	ไม่แน่ใจ မသေချာပါ	เห็นด้วย ယုံကြည်သည်
โอกาสการติดโรค ရောဂါကူးစက်နိုင်သည့်အခါ			
1. เด็กและผู้ใหญ่มักไม่เป็นโรคไข้เลือดออก ၁။သက်ကြီးရွယ်အိုနှင့်ကလေး၌သွေးလွန်တုပ်ကွေးရောဂါ ဖြစ်များသည်။			
2. ทุกคนมีโอกาสที่จะเป็นโรคไข้เลือดออก လူသားအားလုံးသွေးလွန်တုပ်ကွေးရောဂါဖြစ်နိုင်သည်။			
3. ถึงแม้จะเคยเป็นโรคไข้เลือดออก คุณก็ยังมีโอกาสที่จะเป็นอีกได้ သွေးလွန်တုပ်ကွေးရောဂါဖြစ်ခဲ့သော်လည်းနောက်ထပ်ရောဂါထပ်ဖြစ်နိုင်ခွင့်အခွင့်အရေးရှိသေးသည်။			
4. คุณมีโอกาสที่จะเป็นโรคไข้เลือดออก ถ้าคุณอยู่ในที่มืดและชื้น အကယ်၍လူကြီးမင်းမှောင်ပိုက်သောနေရာတွင်နေထိုင်ပါကသွေးလွန်တုပ်ကွေးရောဂါဖြစ်ဖို့အခွင့်ရှိသည်။			
5. คุณมีโอกาสที่จะเป็นโรคไข้เลือดออกมากขึ้นถ้ามีผู้ป่วยโรคไข้เลือดออกอาศัยอยู่ในบ้าน သွေးလွန်တုပ်ကွေးသည့်နှင့်တဝဇ်မိအတွင်းအတူတကွနေထိုင်ပါကလူကြီးမင်းရောဂါဖြစ်နိုင်မှုအခွင့်အရေးများသည်။			
6. การใช้แก้ว จานทานข้าว และผ้าเช็ดตัวร่วมกับผู้ป่วยโรคไข้เลือดออก จะไม่ติดโรค သွေးလွန်တုပ်ကွေးသည့်နှင့်အတူခွက်ပန်းကန်၊မျက်နှာသုတ်ပုဝါအတူသုံးစွဲခြင်းရောဂါမကူးစက်နိုင်ပါ။			
7. การนอนในมุ้งสามารถป้องกันคุณและครอบครัวของคุณ เป็นโรคไข้เลือดออกได้ သင်နှင့်သင့်မိသားစုအားခိုင်တိုင်းများခြင်ထောင်၊ထောင်အိပ်၍သွေးလွန်တုပ်ကွေးရောဂါမှကာကွယ်နိုင်သည်။			
ความรุนแรงของโรค ရောဂါ၏ပြင်းထန်မှု			

รหัส ....

ข้อความ စာကြောင်းအမျိုးမျိုး	ไม่เห็นด้วย မယုံကြည်ပါ	ไม่แน่ใจ မသေချာပါ	เห็นด้วย ယုံကြည်သည်
8. โรคไข้เลือดออกเป็นปัญหาสำคัญต่อสุขภาพ သွေးလွန်တုပ်ကွေးရောဂါသည်ကျန်းမာရေး၏အဓိကပြဿနာတစ်ခုဖြစ်သည်။			
9. โรคไข้เลือดออกเป็นเหตุทำให้เด็กเสียชีวิตบ่อยครั้ง သွေးလွန်တုပ်ကွေးရောဂါသည်မကြာခဏကလေးသူငယ်များကိုသေဆုံးစေသည်။			
10. โรคไข้เลือดออกเป็นปัญหาสำคัญที่ทำให้เสียงบประมาณทางสาธารณสุข သွေးလွန်တုပ်ကွေးရောဂါသည်ကျန်းမာရေး၏ဘဏ္ဍာငွေဆုံးရှုံးအများဆုံးနှင့်အဓိကပြဿနာတစ်ခုဖြစ်သည်။			
11. มันยากที่จะรักษาโรคไข้เลือดออกได้อย่างมีประสิทธิภาพเมื่อเด็กป่วย ကလေးသူငယ်များနာချိန်တွင်သွေးလွန်တုပ်ကွေးရောဂါကိုအကောင်းဆုံးပြန်ပြင်အောင်ကုသရန်ခက်ခဲသည်။			
ผลประโยชน์ အကျိုးတရားများ			
12. การใช้มาตรการป้องกันโรคจะช่วยลดจำนวนผู้ป่วยเป็นโรคไข้เลือดออก ကာကွယ်မှုစနစ်မှန်ကန်အသုံးပြုခြင်းသွေးလွန်တုပ်ကွေးရောဂါသည်များလျော့နည်းနိုင်သည်။			
13. การมีพฤติกรรมป้องกันโรคจะช่วยลดความวิตกกังวลต่อโรคไข้เลือดออก ကာကွယ်နည်းအမျိုးမျိုးဆောင်ရွက်ခြင်းသွေးလွန်တုပ်ကွေးရောဂါပူပင်သောကကင်းဝေးစိုးရိမ်ရောက်နိုင်သည်။			
14. การมีพฤติกรรมป้องกันจะช่วยให้คุณภาพชีวิตดีขึ้น ကာကွယ်နည်းအမျိုးမျိုးပြုလုပ်ဆောင်ရွက်ခြင်းသည်ဘဝအတွက်ကျန်းမာသန့်ရှင်းကောင်းမွန်စေဖို့ကူညီရာရောက်သည်။			
15. การป้องกันโรคไข้เลือดออกจะช่วยประหยัดค่าใช้จ่ายได้ သွေးလွန်တုပ်ကွေးရောဂါကာကွယ်ခြင်းဖြင့်ကုန်ကျစရိတ်သက်သာစေသည်။			
16. การดูแลผู้ป่วยไม่ทำให้เสียเวลาเมื่อคุณมีผู้ป่วยโรคไข้เลือดออกอาศัยอยู่ในบ้าน သင်၏အိမ်၌သွေးလွန်တုပ်ကွေးရောဂါဖြစ်လာပါကလှုင်းရောဂါသည်ကိုကြည့်ရှုစောင့်ရှောက်ဖို့အချိန်မကုန်ဆုံးနိုင်ပါ။			
อุปสรรค အခက်အခဲမှု			
17. มันยากที่จะป้องกันโรคไข้เลือดออกเพราะโรคไข้เลือดออกมียุงเป็นพาหะ သွေးလွန်တုပ်ကွေးရောဂါကာကွယ်ရာတွင်ခက်ခဲမှုအကြောင်းအရင်းမှာရောဂါပိုးများကို ခြင်ကျားသယ်ဆောင်လာ သောကြောင့်ဖြစ်သည်။			
18. การไปซื้อสเปรย์ฆ่ายุงจากร้านเป็นการเสียเวลา ခြင်ဖျန်းဆေးဗူးဝယ်ရာ၌အချိန်ကုန်စေသည်။			

รหัส ....

ข้อความ စာကြောင်းအမျိုးမျိုး	ไม่เห็นด้วย မထောက်ခံပါ	ไม่แน่ใจ မသေချာပါ	เห็นด้วย ထောက်ခံသည်
ความรุนแรงของโรค ရောဂါ၏ပြင်းထန်မှု			
19. การป้องกันโรคไข้เลือดออกต้องใช้ค่าใช้จ่ายมาก သွေးလွန်တုပ်ကွေးရောဂါကာကွယ်ရာတွင်ကုန်ကျစရိတ် များကုန်ဆုံးစေသည်၊			
20. มันไม่สะดวกที่จะใส่เสื้อแขนยาวเพื่อป้องกันยุงกัด ခြင်ကိုက်ကာကွယ်ဖို့အကျီလက်ရှည်ဝတ်ရာတွင်ကိုက်ညီသော်လည်းစွမ်းရှိ၍ရှုပ်ထွေးစေသည်။			
21. การใช้มุ้งป้องกันยุงในตอนกลางวันเป็นภาระมาก နေ့လယ်နေ့ခင်းတွင်၍ခြင်ထောင်ထောင်ရာ၌အပိုအလုပ်တခုဖြစ်စေသည်၊			
22. สเปรย์กันยุงทำให้เกิดกลิ่นไม่ดี ခြင်းဆေးဖျန်းဖျန်း၍အနံ့ အသက်ဆိုးမှုဖြစ်စေသည်။			

ส่วนที่ 4: สิ่งชักนำสู่การปฏิบัติ

အပိုင်း ၄။ ဦးဆောင်လုပ်ဆောင်မှုအချက်အလက်များ

กรุณาตอบคำถามโดยใส่เครื่องหมาย ✓ ลงในช่อง ( ) ที่ตรงกับความคิดของคุณมากที่สุด

ကျေးဇူးပြု၍မိမိကိုယ်ပိုင်အတွေးနှင့်ဖြေဆိုချက်များကိုတွင်းမေးခွန်းထဲ၌( )အမှန်အမှတ်သားဖြစ်၍ဖြေဆိုရန်

1. ตัวคุณเอง สมาชิกในครอบครัว ญาติของคุณ หรือเพื่อนของคุณเคยเป็นโรคไข้เลือดออกหรือไม่
သင်နှင့်မိသားစုဝင်၊ဆွေမျိုးမောင်နှမသူငယ်ချင်းများသွေးလွန်တုပ်ကွေးရောဂါဖြစ်ခဲ့ဘူးလား ?

) ใช่ ဟုတ် ၊ ရှိ ( ) ไม่ใช่ မဟုတ်ဘူး( ) ไม่ทราบ မသိပါ

2. ใครเป็นคนให้ข้อมูลหรือคำแนะนำเกี่ยวกับวิธีการป้องกันและควบคุมโรคไข้เลือดออกกับคุณ (สามารถตอบได้มากกว่าหนึ่งคำตอบ)
သွေးလွန်တုပ်ကွေးရောဂါနှင့်ပတ်သက်၍ထိန်းသိမ်းကာကွယ်နည်းများကိုမည်သူကအကြံပေးခဲ့သလဲ၊ (မေးခွန်းတခုထက်မကဖြေဆိုနိုင်သည်)

( ) หมอ ဆရာဝန် ( ) พยาบาล သူနာပြုဆရာမ ( ) อาสาสมัครสาธารณสุข ကျန်းမာရေးစေတနာ့ဝန်ထမ်း ( ) สมาชิกในครอบครัว မိသားစုဝင်များ( ) ญาติ ဆွေမျိုးများ ( ) เพื่อน သူငယ်ချင်းမိတ်ဆွေများ

( ) ไม่มีใครให้ข้อมูล မည်သူတဦးတယောက်မှအချက်အလက်မပေးပါ

3. โดยปกติแล้วคุณได้รับข้อมูลเกี่ยวกับโรคไข้เลือดออกจากสื่อใด (สามารถตอบได้มากกว่าหนึ่งคำตอบ)
သွေးလွန်တုပ်ကွေးရောဂါနှင့်ပတ်သက်သောသတင်းအကြောင်းအရာကိုသာမန်မည်သည့်ဆက်သွယ်မှုကသိခဲ့ရပါသလဲ၊(မေးခွန်းတခုထက်မကဖြေဆိုနိုင်သည်)

( ) ทีวี တီဗွီ( ) วิทยุ ရေဒီယို ( ) หนังสือพิมพ์ သတင်းစာ( ) แผ่นพับ ပိုစတာကာချပ်( ) ประกาศทั่วไป ထွေထွေကြေငြာ

( ) ใบปลิว လက်ကမ်းစာစောင်

รหัส ....

ส่วนที่ 5: พฤติกรรมป้องกันโรค အပိုင်း၅၊ ရောဂါကာကွယ်စောင့်ရှောက်မှုများ

กรุณาตอบคำถามโดยใส่เครื่องหมาย ✓ ลงในช่อง ( ) ที่คุณคิดว่าเหมาะสมกับคุณมากที่สุด
ကျေးဇူးပြုပြီး မိမိကိုယ်ပိုင်အတွေးနှင့်ဖြေဆိုချက်များကိုကွင်းငယ်တွင်ထည့်၍( )အမှန်အမှတ်သားခြစ်၍ဖြေဆိုရန်

เป็นประจำ: ถ้าคุณใช้การป้องกันทุกวัน
နေ့စဉ် သင်ကာကွယ်မှုနေ့စဉ်စောင့်ရှောက်ခြင်း
เป็นบางครั้ง: ถ้าคุณใช้การป้องกันสัปดาห์ละหนึ่งหน
တစ်ခါတလေ သင်တပတ်တစ်ခါကာကွယ်မှုစောင့်ရှောက်ခြင်း။
นาน ๆครั้ง: ถ้าคุณใช้การป้องกันเดือนละหนึ่งหน
ကြာကြာမှတစ်ကြိမ် သင်တလတစ်ခါမှကာကွယ်မှုစောင့်ရှောက်ခြင်း။
ไม่เคย: ถ้าคุณไม่เคยหรือไม่ใช้การป้องกัน
မပြုလုပ်ဖူး တစ်ခါမှကာကွယ်မှုမစောင့်ရှောက်ခြင်း။

การใช้มุ้งกันยุง ခြင်ထောင်အသုံးပြုခြင်း

1.คุณหรือสมาชิกในครอบครัวของคุณใช้มุ้งเวลานอนตอนกลางวันเป็นประจำหรือไม่
သင်နှင့်မိသားစုဝင်နေ့စဉ်နေ့လယ်အိပ်ရာ၌အမြဲခြင်ထောင်ထောင်အိပ်ပါသလား ?
( )เป็นประจำ နေ့စဉ် ( )เป็นบางครั้ง တစ်ခါတလေ ( )นาน ๆ ครั้ง ကြာကြာမှတစ်ခါ ( )ไม่เคย မလုပ်ဖူးပါ

การฉีดยาฆ่าแมลงและการใช้ยากันยุง
ပိုးသတ်ဆေးအသုံးပြုခြင်းနှင့်ခြင်တားဆေးသုံးပြုခြင်း။

2.คุณใช้ยาฆ่าแมลงเพื่อกำจัดยุงเป็นประจำหรือไม่
သင်ပိုးသတ်ဆေးဖျန်းပြီးနေ့စဉ်ခြင်တားဆေးသုံးနေပါသလား ?
( )เป็นประจำ နေ့စဉ် ( )เป็นบางครั้ง တစ်ခါတလေ ( )นาน ๆ ครั้ง ကြာကြာမှတစ်ခါ ( )ไม่เคย မလုပ်ဖူးပါ

การทำลายแหล่งเพาะพันธุ์ยุง
ခြင်ပေါက်ပွါးသောနေရာဖျက်ဆီးခြင်း။

3.คุณกำจัดภาชนะขนาดเล็กรอบบ้านคุณเพื่อทำลายแหล่งเพาะพันธุ์ยุงเป็นประจำหรือไม่
သင်လူကြီးမင်းနေ့စဉ်အိမ်ဝန်းကျင်ရှိအမှိုက်များသိမ်းဆည်းပြီးခြင်ပေါက်ပွါးရာနေရာဖျက်ဆီးခဲ့ဖူးလား ?
( )เป็นประจำ နေ့စဉ် ( )เป็นบางครั้ง တစ်ခါတလေ ( )นาน ๆ ครั้ง ကြာကြာမှတစ်ခါ ( )ไม่เคย မလုပ်ဖူးပါ

4.คุณเปลี่ยนน้ำหรือเติมทรายอะเบทหรือใส่ผงซักฟอกในภาชนะเก็บน้ำเป็นประจำหรือไม่
သင်နေ့စဉ်ရေအိုးရေကန်ရေပုံးတို့၌ရေလဲခြင်းဆပ်ပြာမှုန့် နှင့်ဓါတုသဲထည့်ပေးပါသလား ?
( )เป็นประจำ နေ့စဉ် ( )เป็นบางครั้ง တစ်ခါတလေ ( )นาน ๆ ครั้ง ကြာကြာမှတစ်ခါ ( )ไม่เคย မလုပ်ဖူးပါ

5.คุณปิดฝาตุ่มน้ำหรือภาชนะเก็บน้ำทันทีที่ใช้เป็นประจำหรือไม่
သင်နေ့စဉ်ရေအိုးရေကန်ရှိအဖုံးများဖုံးပိတ်နေလား ?
( )เป็นประจำ နေ့စဉ် ( )เป็นบางครั้ง တစ်ခါတလေ ( )นาน ๆ ครั้ง ကြာကြာမှတစ်ခါ ( )ไม่เคย မလုပ်ဖူးပါ

6.คุณตรวจดูลูกน้ำในภาชนะเก็บน้ำเป็นประจำหรือไม่
သင်နေ့စဉ်ရေအိုးရေကန်တို့၌ပိုးလောက်လန်းစစ်ဆေးမှုလုပ်ပါသလား ?
( )เป็นประจำ နေ့စဉ် ( )เป็นบางครั้ง တစ်ခါတလေ ( )นาน ๆ ครั้ง ကြာကြာမှတစ်ခါ ( )ไม่เคย မလုပ်ဖူးပါ

ปลา အလှမွေးငါး

7.คุณตรวจว่ามีปลากินลูกน้ำในภาชนะเก็บน้ำต่างๆ บ่อยหรือไม่
သင်ရေအိုးရေကန်၌ထည့်မွေးထားသောငါးများပိုးလောက်လန်းစားမှုရှိမရှိစစ်ဆေးပါသလား ?။
( )เป็นประจำ နေ့စဉ် ( )เป็นบางครั้ง တစ်ခါတလေ ( )นาน ๆ ครั้ง ကြာကြာမှတစ်ခါ ( )ไม่เคย မလုပ်ဖူးပါ

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ขอขอบคุณที่ให้ความร่วมมือในการตอบแบบสอบถาม
မေးခွန်းအားလုံးဖြေဆိုပေးသည့်အတွက်ကျေးဇူးတင်ပါသည်။

BIOGRAPHY

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