PREVENTIVE BEHAVIOR OF DENGUE HEMORRHAGIC FEVER AMONG PEOPLE IN PHRA NAKHON SI AYUTTHAYA MUNICIPALITY OF PHRA NAKHON SI AYUTTHAYA PROVINCE, THAILAND

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ABSTRACT

Dengue hemorrhagic fever (DHF) is still the major problem of public health in the South-East Asia, especially in Thailand. Despite long time control in DHF, Phra Nakhon Si Ayutthaya Province still has a high incidence of DHF. This research aimed to identify preventive behaviors in DHF and factors related to DHF preventive behaviors among people aged 18 years or older who lived in Phra Nakhon Si Ayutthaya Municipality, Phra Nakhon Si Ayutthaya Province, Thailand. A cross sectional study was performed with people aged 18 years or older who lived in Phra Nakhon Si Ayutthaya Municipality, Phra Nakhon Si Ayutthaya Province, Thailand. 492 self-admi nistered questionnaires were distributed to eligible people in July 2014. Chi-square tests and multiple logistic regression were used to examine factors related to DHF preventive behaviors.

Only 422 questionnaires were returned with a response rate of 85.8%. Nearly 25% of respondents were classified into the good DHF preventive behavior group. Chi-square tests revealed that variables associated with preventive behaviors were perceived benefits, perceived barriers and availability of the larvicide for treating water, temephos in households. None of the socio-demographic variables, knowledge levels, perception of DHF susceptibility, perception of DHF severity, family experience of DHF, and receiving information from healthcare personnel and mass media were significant. After adjusting for other factors, people who had the larvicide for treating water, temephos in households had higher good preventive behavior than those who did not (Adj OR = 2.89, 95% CI = 1.22-6.86).

Enhancing people with DHF knowledge, DHF perceptions, cues to action, and preventive behaviors should be regularly done with communities and local administrators. Increasing the availability of the larvicide for treated water, temephos in households should be continuously supported by local administrators

KEY WORDS: DENGUE HEMORRHAGIC FEVER / PREVENTIVE BEHAVIORS / TEMEPHOS / PHRA NAKHON SI AYUTTHAYA

98 pages

พฤติกรรมการป้องกันโรคไข้เลือดออกของประชาชนซึ่งอายุตั้งแต่ 18 ปีขึ้นไปในเขตเทศบาลนครพระนครศรีอยุธยา จังหวัดพระนครศรีอยุธยา

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บทคัดย่อ

ไข้เลือดออกยังคงเป็นปัญหาสำคัญด้านสาธารณสุขในเอเชียตะวันออกเฉียงใต้ โดยเฉพาะประเทศไทย ทั้งที่มีการควบคุมโรคเป็นเวลานานยังคงมีอุบัติการณ์ของโรคไข้เลือดออกสูงในจังหวัดพระนครศรีอยุธยา งานวิจัยนี้เป็นการศึกษาแบบภาคตัดขวางเพื่อศึกษาพฤติกรรมการป้องกันโรคไข้เลือดออกของประชาชนที่อาศัยอยู่ในเขตเทศบาลนครพระนครศรีอยุธยาซึ่งอายุ 18 ปีขึ้นไปกลุ่มตัวอย่างมีจำนวน 492 ราย ซึ่งสามารถอ่านออกเขียนได้และตอบแบบสอบถามเอง เมื่อเดือน กรกฎาคม พศ.2557 การวิเคราะห์ความสัมพันธ์ระหว่างตัวแปรต้นและตัวแปรตามโดยการใช้การทดสอบแบบไคกำลังสอง (Chi –squareTest) และการวิเคราะห์การถดถอยลอจิสติค (Multiple logistic regression)

ได้รับแบบสอบถามคืน 422 ฉบับ (ร้อยละ 85.8) พบว่าร้อยละ 25 ของผู้ตอบแบบสอบถามมีพฤติกรรมที่ดีในการป้องกันโรคไข้เลือดออก ปัจจัยที่มีผลต่อพฤติกรรมการป้องกันโรคไข้เลือดออก ประกอบด้วยการรับรู้ถึงประโยชน์และการรับรู้ถึงอุปสรรคในการป้องกันโรค ร่วมกับการมีทรายอะเบทพร้อมใช้ในครัวเรือน ส่วนปัจจัยทางสังคมและเศรษฐกิจ ระดับความรู้เกี่ยวกับโรค การรับรู้ถึงความเสี่ยงในการเกิดโรค การรับรู้ถึงความรุนแรงของโรค การได้รับข้อมูลเกี่ยวกับโรคจากบุคคลากรสาธารณสุข จากสื่อสาธารณะ และประวัติการเจ็บป่วยด้วยโรคไข้เลือดออกของคนในครอบครัว ไม่มีผลต่อพฤติกรรมการป้องกันโรคไข้เลือดออกในการศึกษานี้พบว่าเมื่อปรับด้วยอิทธิพลของตัวแปรอื่นๆการมีทรายอะเบท พร้อมใช้ในครัวเรือน ส่งผลให้เกิดพฤติกรรมที่ดีในการป้องกันโรคไข้เลือดออกได้มากกว่ากลุ่มที่ไม่มีทรายอะเบทพร้อมใช้อย่างมีนัยสำคัญทางสถิติ (Adj OR = 2.89, 95% CI = 1.22-6.86) ควรมีการสนับสนุน ให้ความรู้เกี่ยวกับโรคไข้เลือดออกแก่ประชาชนโดยผ่านสื่อสาธารณะ และ บุคคลากรสาธารณสุขเพื่อส่งเสริมให้เกิดการรับรู้เกี่ยวกับโรค การรับรู้ความเสี่ยงในการเกิดโรค การรับรู้ความรุนแรงของโรค การรับรู้ประโยชน์ในการป้องกันโรคส่งเสริมให้เกิดการแก้ไขอุปสรรคในการป้องกันโรค และควรมีช่องทางต่างๆที่กระตุ้นให้เกิดพฤติกรรมการป้องกันโรคเป็นประจำสม่ำเสมอ โดยความร่วมมือของชุมชนและองค์กรบริหารส่วนท้องถิ่น ควรมีการสนับสนุนให้มีทรายอะเบทพร้อมใช้ในครัวเรือนอย่างต่อเนื่องโดยองค์กรบริหารส่วนท้องถิ่น

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WHO	World Health Organization
DF	Dengue Fever
DHF	Dengue Hemorrhagic Fever
DSS	Dengue Shock Syndrome
HBM	Health Belief Model
PN Mu	Phra Nakhon Si Ayutthaya Municipality
MA Mu	Muang Ayothaya Municipality
Amphur	District
Tambon	Sub-district

CHAPTER I
INTRODUCTION

1.1 Rational and Justification

Dengue fever is one of the oldest diseases that have been discovered for more than two hundred years ago. The first reported epidemic of dengue fever occurred between in 1779-1780 in Asia, Africa and North America (1). Occurrence outbreaks simultaneously in three continents indicate that virus and their mosquito carrier have spread worldwide in the tropical areas for more than 200 years. It became distributed worldwide in the tropics during the 18th and 19th centuries due to an expanded shipping industry and commerce (2). The principal mosquito vector (3), Aedes agypti uses stored water on the ships as breeding sites and could maintain a cycle of transmission even through long voyage. The shipment to the ports could be spread dengue transmission to others though the introduction of the virus and mosquito. Slower transportation in that period made epidemics infrequent with intervals between 10-40 years. Dengue infection was considered a sporadic disease, causing epidemics at long intervals during the 19^{th} century. After World War II, during the 20^{th} century, a new dengue virus emerged as 4 serotypes with rapidity in transportation. Dengue hemorrhagic fever (DHF) (4,5) was the emerging disease that first discovered in Philippines in the year 1954, and in Thailand in the year 1958. After, that DHF spread all around the world especially in tropical area. Due to well-developed mass transportation, dengue can be spread easily from urban to rural areas in a short period. Currently, dengue is the most important mosquito born viral infection in the world due to climate change and rapid unplanned growth in population. Dengue infection especially Dengue Hemorrhagic fever is still a major health problem in the world, especially in tropical areas. Dengue infection caused by the dengue virus is an RNA virus that needs the Aedes agypti mosquito to transmit the virus to humans. Four serotypes of virus have been reported as DEN-1, DEN-2, DEN-3 and DEN-4 worldwide since year 2004 compare to year 1997. Symptoms of dengue

fever are fever, myalgia, bone pain and bleeding in severe cases. While DHF is sequential, secondary infection leads to clinical plasma leakage. In the past DHF usually was diagnosed in the children under 15years of age. Though now DHF tendency affects to young adults especially 10-25 years old compared to in the past which was 5-9 years old (3). DHF is a secondary infection that may cause leakage condition in severe cases and may lead to hypovolemic shock called Dengue shock syndrome (DSS) (3). The cause of death in DHF may be from prolonging shock that leads to massive bleeding due to disseminated coagulopathy from fluid overload cause by improper and inappropriate fluid therapy. Dengue fever (DF) (3) is a primary infection from the dengue virus that has mild clinical symptoms, like myalgia, bone pain and retrobulbar pain.

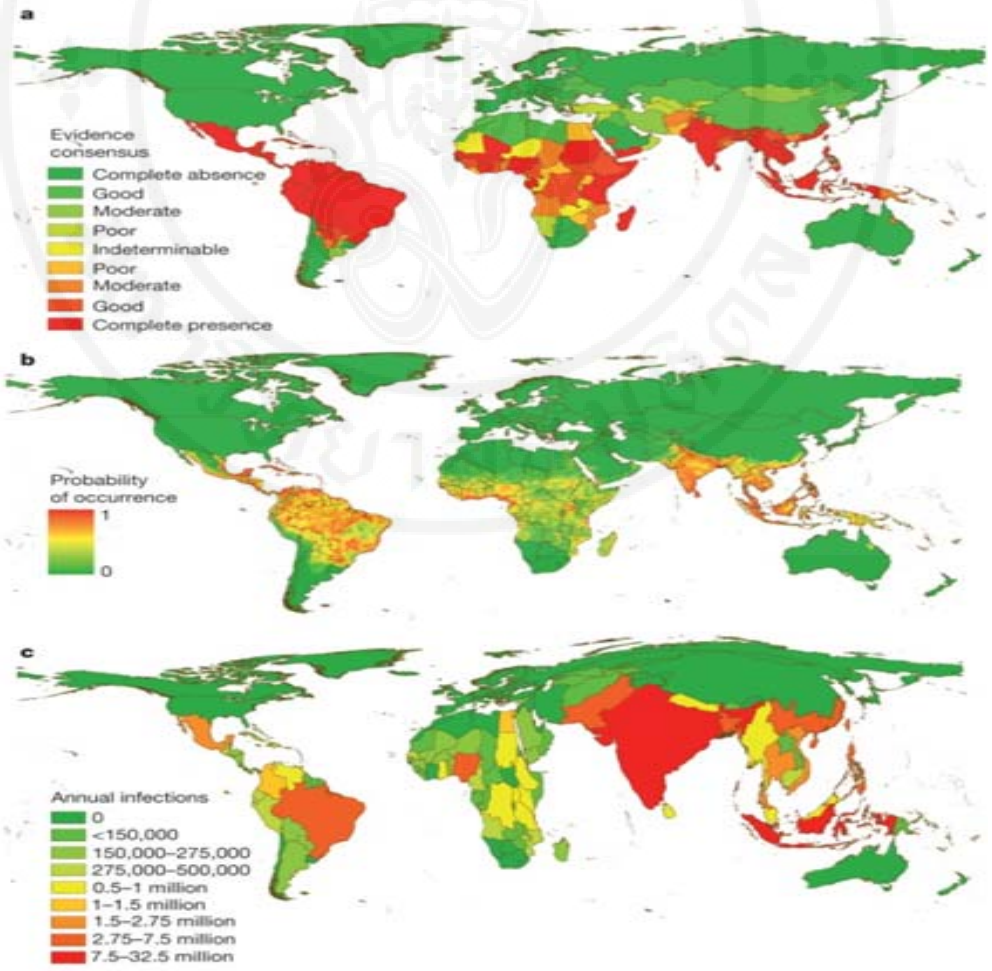

Figure 1.1 Global dengue situation

Global evidence consensus, risk and burden of dengue in 2010

S Bhatt et al. Nature 000, 1-4 (2013) doi:10.1038/nature12060 (6)

The Global dengue situation (2), is that forty percent of the world's population (about 2.5 billion people) live in areas of risk for dengue transmission. Endemic areas of dengue are in at least 100 countries in Asia, the pacific, the Americas, Africa and in the Caribbean.

The World Health Organization (WHO) estimated that 50 to 100 million infections of dengue fever occur yearly, including 500,000 cases of DHF and 22,000 deaths, mostly from children.

Bhatt et al (6) used a cartographic approach that predict dengue to be ubiquitous throughout the tropics, with local spatial variations in risk influenced strongly by rainfall, temperature and the degree of urbanization. This study predicted dengue case three times of WHO estimations.

Global strategies include increase capacity in surveillance, outbreak response, reduction in disease burden, and integrated vector control.

In Thailand, DHF first spread in the year 1958 (7). After the disease spread was spreader across all country. Infected dengue patients have been rising steadily for the past over 50 years ago. DHF is one of the most vector born disease infections for many decades in Thailand. Epidemic pattern has changed of one alternate year to irregular patterns.

Table 1.1 Dengue situation in Thailand reported by number, morbidity rate (case per 100,000population), mortality rate (case per 100,000population) (7).

Year	No. of case	Morbidity rate	Mortality rate
1958	2,158	8.8	13.90
1987	174,285	Na	0.50
1997	101,689	169.13	0.25
1998	127,189	209.14	0.34
1999	24,826	40.39	0.23
2000	18,617	30.19	0.17
2004	38,367	**	0.12
2005	45,893	**	0.15
2010	115,768	182.30	0.22
2011	65,951	103.28	0.09
2012	76,361	116.24	0.11
2013	150,454	234.81	0.21

** Data not available

Epidemiology of dengue infection in Thailand in the year 2013 (7). Reported cases were 150,454 patients that incidence 234.81 people per one hundred thousand people (desired value 50 people per 100,000people). One hundred thirty three cases of death were reported with mortality rate of 0.21 cases per hundred thousand people and an in case fatality rate 0.09%.

Data that from the Department of Communicable Disease Control (CDC) of the Ministry of Public Health shows that DHF has spread by epidemic every ten years. Incidence in the year 1999 was significantly declined due to policies in prevention and control that was provided to celebrate King Bhumipol's reign in the year1999-2000.

Mortality rate had a tendency to decline especially from the year 1987 due to accessibility to patients and well developed equipment, investigation, clinical practice guidelines and treatment. Reduction in incidence of DHF case had a well-developed strategy to control dengue, like well trained personnel, prompt chemical spray and continuity in surveillance by breaking the life cycle of the mosquito. Continuity in prevention and control of DHF is the best strategy in DHF management. The Ministry of Public Health has continued this project in prevention and control in DHF from the year 1999 to present.

Thailand (7).

Week 50th Week 51th

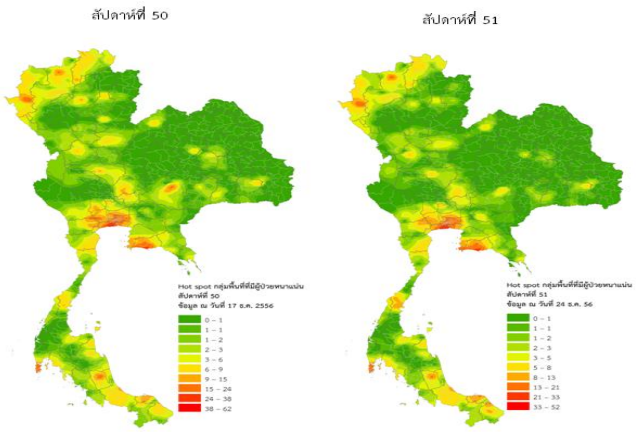

Figure 1.2 Distribution in 50, 51 week in the year 2013.

DHF has now spread to all areas in Dengue infection has been a major public health problem in Thailand for more than 50 years since the year 1958. However mortality rate has significantly declined from 2% to 0.23% (3) due to good medical intervention. In additional DHF case-fatality rate has also declined shown in Figure 2.3

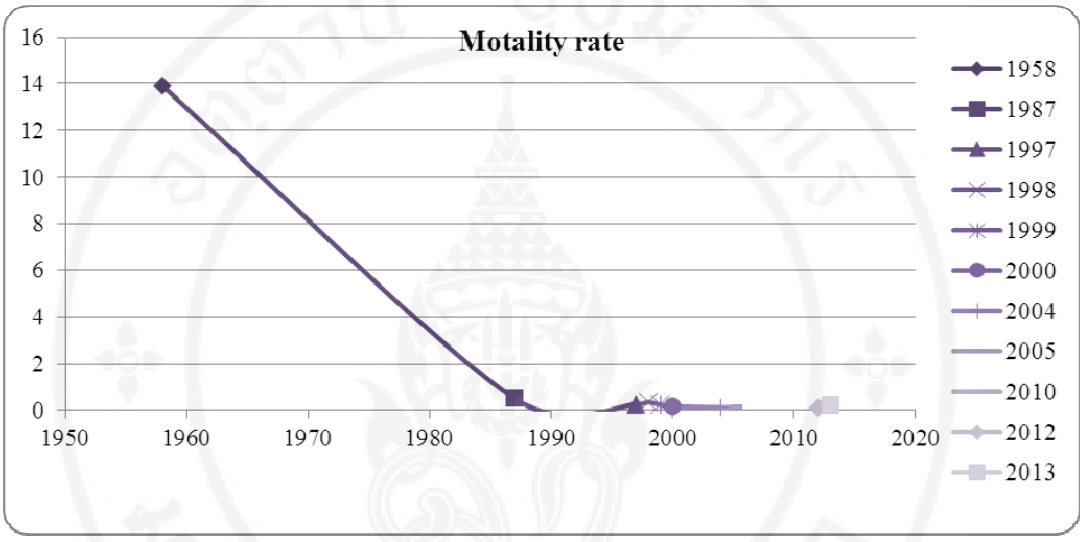

Figure 1.3 Present Mortality rate of dengue hemorrhagic fever in cases per one hundred thousand people (3,7) Importance of Primary Health care.

Dengue transmission can be reduced by community concern and participation which include 3 hour time frame to receive reports of new cases, 3 hours to control the disease, and vector control in a 100 meter radius within one day. Four main methods in dengue control are environmental management, personal protection, biological control and chemical control. Dengue vaccine is currently in process, though not available for use. However the cost effectiveness in dengue control is primary control of mosquito vector, especially in the larval stage. The Ministry of Public Health promotes dengue control in campaign 5 ป, 1ข (8). Dengue infection are usually found in the crowed communities that have poor environmental sanitation, substandard housing, inadequate water supply and ineffective waste management. Vector control is the best method to control dengue transmission, especially in the larvae stage (3). Community participation (9) in vector control can be a key success

factor to reduce transmission of disease. Information and knowledge to prevent and control diseases should be provided to communities in various ways by mass media, health care personnel, health care volunteer and school lessons. Health care personnel should be informed and instructed in the knowledge of the disease, how to maintain environment, and manage dengue infections. Primary health care workers should do in early diagnosis, primary management and especially disease control. Due to the disease tendency to spread in large cities by vector mosquito, effective control of the disease and surveillance can reduce outbreaks of disease. Higher morbidity and mortality due to dengue infection in the past were caused by delayed diagnosis that lead to prolong shock, disseminated intra vascular coagulopathy, massive bleeding and finally death. However nowadays delayed diagnosis has declined due to coverage in knowledge about the disease to people and health care personnel. Investigation in diagnosis especially CBC (complete blood count) now is available in every primary health care center. Health care personnel at all levels especially in rural areas have been now instructed about in early diagnosis and effective management of dengue infection. Clinical practice guidelines on DHF and referral systems to upper level center were well developed. Management in severe cases though appropriated fluid replacement therapy, proper amount fluids for the course of the disease, consultation systems and prompt referrals to well-equipped hospitals were better developed which caused a decline in morbidity and mortality. Incidence of dengue infection in Phra Nakhon Si Ayutthaya Province was 91.92/100,000 population in the year 2013 (10) compare to target average 50/100,000 population.

Researcher would like to know what factors affecting preventive behaviors against DHF among people living in Phra Nakhon Si Ayutthaya Municipality and identify factors that affect to DHF preventive behaviors in order to develop strategy method to control dengue vector in the future.

1.2 Research Questions

1.2.1 What are the DHF preventive behaviors of people in Phra Nakhon Si Ayutthaya Municipality of Amphur Phranakorn Si Ayutthaya ?

1.2.2 What are factors affecting preventive behaviors against DHF among people living in Phra Nakhon Si Ayutthaya Municipality of Amphur Phra Nakhon Si Ayutthaya?

1.3 Research objectives

1.3.1 General objectives

To find out DHF preventive behaviors among people in Phra Nakhon Si Ayutthaya Municipality of Phra Nakhon Si Ayutthaya Province and factors associated with to DHF preventive behaviors of people.

1.3.2 Specific objectives

1.3.2.1 To describe the preventive behaviors against DHF among people In Phra Nakhon Si Ayutthaya Municipality, Phra Nakhon Si Ayutthaya.

1.3.2.2 To describe variables (socio-demographic variables, knowledge, perception about preventive behaviors against DHF and cues to action against DHF) among people in Phra Nakhon Si Ayutthaya Municipality, Phra Nakhon Si Ayutthaya.

1.3.2.3 To examine the association between variables (socio-demographic Variables, knowledge, perception and cues to action) to preventive behaviors against DHF among people in Phra Nakhon Si Ayutthaya Municipality, Phra Nakhon Si Ayutthaya.

1.4 Conceptual framework to HBM (11)

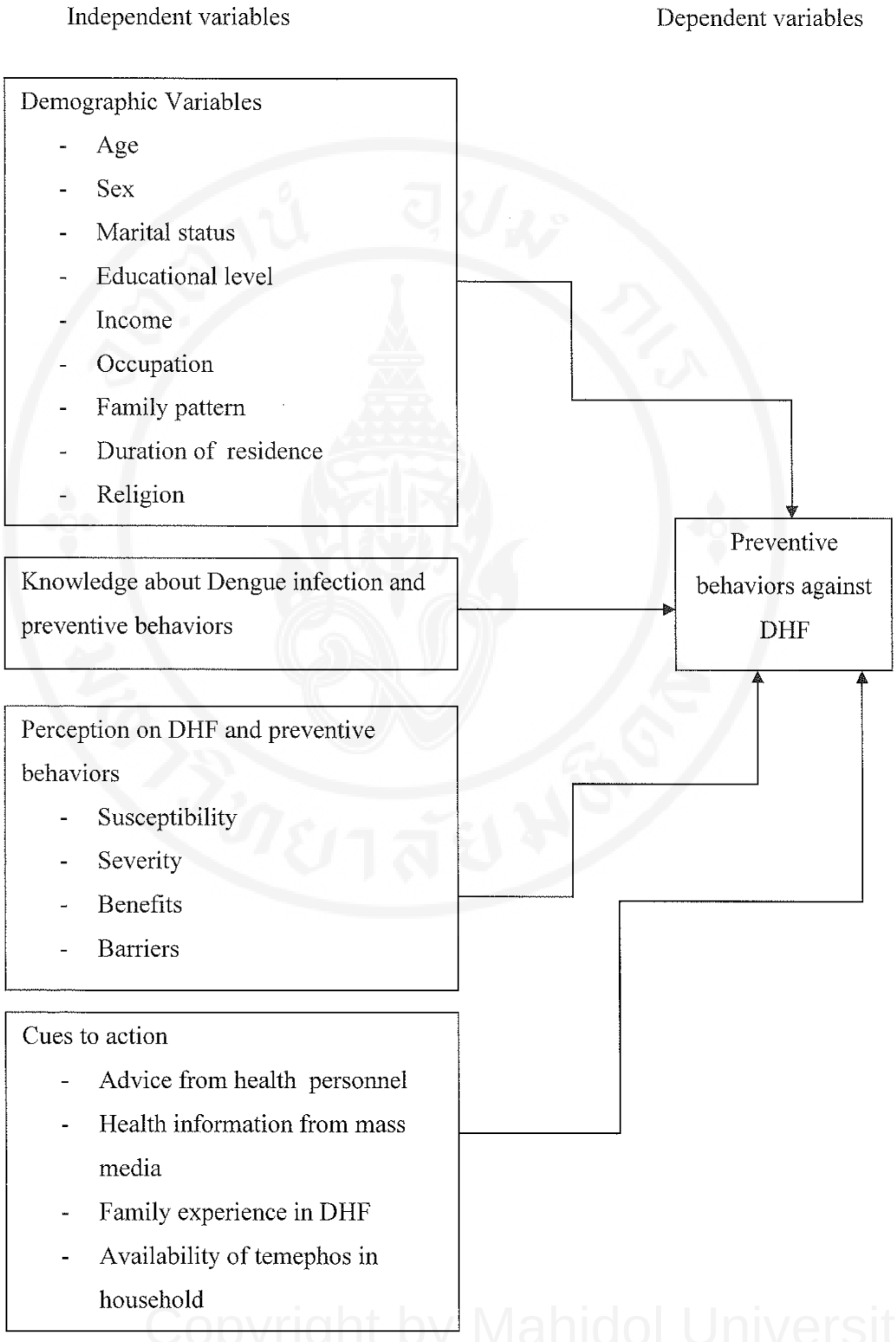

Figure 1.4 Conceptual framework to Health Belief Model

Phuanukoonnon et al (12) studied in Khon Kaen Province to investigate the association between theorical components of HBM and folk knowledge and belief in mosquito control found that several barriers were identified such as insufficient control agents, inadequate knowledge of control methods, incompatibility of control practices to people's belief.

1.5 Definition

1. People in this study refers to adult 18 years or older who permanent living in Phra Nakhon Si Ayutthaya Municipality that are called respondents.

2. Socio-demographic factors: such as age, gender, marital status, education level, occupation, income, duration of stay, family pattern and religion are health related behaviors.

2.1 Age: Defined as respondents' age ranged by year, counting from date of birth to study.

2.2 Gender: Defined as sex of respondents, male and female.

2.3 Marital status defined as status of respondents, categorized to single, married and divorce.

2.4 Education level: Defined as level of education of respondents, categorized into no education, less than Bachelor's degree, Bachelor's degree and higher than Bachelor's degree.

2.5 Occupation: Defined as work of respondents during time of study, categorized into employee, civil servant, business, housewives and no job.

2.6 Income: Defined as the economic status of respondents during the time of study. Income was devided into 3 levels as:

Low income less than 10,000 baht per month.

Moderate income10, 000-20,000 baht per month.

High income more than 20,000 baht per month.

2.7 Duration of stay defined as duration of respondents lived in Phra Nakhon Si Ayutthaya Municipality.

2.8 Family pattern defined as characteristic of family, categorized into nuclear family and extended family.

2.9 Religion defined as the religion that respondents held theological belief.

3. Knowledge is defined as the accumulation of facts, truths, principals and information to which the human mind has access by CV G (13).

In this study, knowledge in DHF refer to the knowledge of respondents about the causes of the disease, mode of transmission of disease, clinical manifestation of disease, treatment of disease and prevention of disease.

Classification level of knowledge is according to Bloom's classification (14).

Low level of knowledge less than 60%.

Moderate level of knowledge 60-80%.

High level of knowledge more than 80%.

4. Perception on DHF defined as awareness or recognition in DHF. It is composed of disease susceptibility, severity of disease, benefit in DHF prevention and barrier in preventive behavior to DHF.

5. Cue to action defined as a hint to enact a behavior. This study was meant what hint to do preventive behavior in DHF.

Family experience of DHF

Advice about health information from health care personnel (doctor, nurse, health care volunteer and other health staff)

Advice about health information from mass media, (TV, radio, newspaper, brochures, leaflets and internet)

Availability of temephos (abate sand) in household

6. Preventive behavior among people against DHF are defined as tightly covered water storage, changing the water collection every week, renovation of the environment, placing biological larvicide fish in uncover water storage, personal protection (net, repellent chemical insecticide) and rubbing water storages.

1.6 Limitation of study

This research was cross sectional study, it focuses on preventive behaviors against DHF by self-administrative questionnaires. In the use of a self-administrative

questionnaire due to the fact that some questions were not easy to understand. Also, questionnaires were distributed by health care volunteers might have been source of bias due to familiarity with people.

1.7 Expected outcome:

1.7.1 The result received from this study will be part of project for prevention and controlling of DHF.

1.7.2. The results of this study can be used as guidelines in the development of administrative policy on health care personnel education, leading to knowledge and understanding about related factors to preventive behaviors of DHF.

1.7.3 The results of this study can be used as a reference for further study concerning preventive behaviors.

CHAPTER II
LITERATURE REVIEW

This review provided a summary of existing literature in relation to DHF. The contents were divided into 4 parts as follows:

1. Dengue Hemorrhagic Fever situation in Phra Nakhon Si Ayutthaya Province
2. Dengue Hemorrhagic Fever (DHF)
3. Theory of Health Belief Model (HBM)
4. The Related study

2.1 Dengue Hemorrhagic Fever situations in Phra Nakhon Si Ayutthaya Province

Dengue Hemorrhagic Fever has been a major public health problem in Thailand for more than 50 years since the year 1958 (7). Nowadays it has been spread abroad all in Thailand. Phra Nakhon Si Ayutthaya is in the middle part of Thailand that endemic area of DHF. Phra Nakhon Si Ayutthaya Province (15) covers 2,556.64 square kilometers, 16 amphurs, 205 tambons. Phra Nakhon Si Ayutthaya province has a registered population of 793,509 people and a density in of 310.37 people per square kilometer in the year 2012.

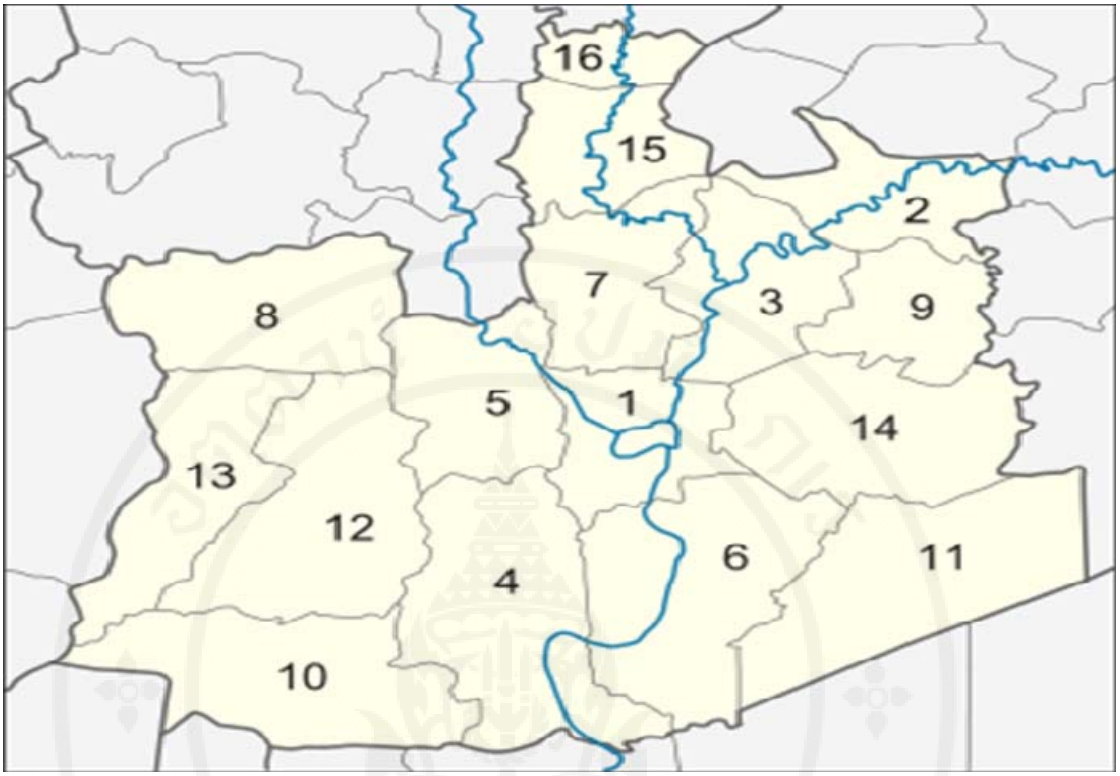

Figure 2.1 Sixteen amphurs in Phra Nakhon Si Ayutthaya province
1.Phra Nakhon Si Ayutthaya 2.Tarua 3.Nakorn Luang 4.Bang si 5.Bangban 6.Bang pa in 7.Bangpahun 8.Phukhai 9.Phachee 10.Ladbualuang 11.Wangnoi 12.Sana 13.Bang sai 14.Uthai 15.Maharat 16.Banprag .

Amphur Phra Nakhon Si Ayutthaya is the center of Phra Nakhon Si Ayutthaya Province that has 2 municipalities, Phra Nakhon Si Ayutthaya Municipality and Muang Ayotthaya Municipality. Amphur Phra Nakhon Si Ayutthaya covers approximately 130.6 square kilometers, 138,746 people for population, 20,256 houses, and a density 1,062.37 of people per square kilometer. The urban community in Amphur Phra Nakhon Si Ayutthaya usually has highest incidence of dengue infection due to more crowed households than other amphurs. The system of municipality should have developed-sanitation in water supply and waste management. However, Thailand municipality's system is still substandard compared with developed countries. Water supply and waste management are still problems which is why the source of the disease cannot be eradicated. Many households in Amphur Phra Nakhon Si Ayutthaya usually have rain water collection in large earthen jar or cement pools that may be the breeding sites for mosquitoes.

Epidemiology of dengue infection in Thailand in the year 2013 (7). Reported cases were 150,454 patients that incidence 234.81 people per one hundred thousand people. One hundred thirty three cases of death were reported with a mortality rate of 0.21 cases per one hundred thousand people (7). In the year 2013, Phra Nakhon Si Ayutthaya Province reported 724 cases within the population of 139,630 people. Incidence of dengue infection was 91.92/100,000 population which is higher than the average target of 50/100,000 population (7,10). No cases of death were reported in that year. In Amphur Phra Nakhon Si Ayutthaya in the year 2013, in number of illness in DHF was 194 patients compared to 724 patients (26.7%) within the province (10). Annual reports showed that Amphur Phra Nakhon Si Ayutthaya had the highest incidence in dengue infection compared to other amphurs in Phra Nakhon Si Ayutthaya. The number of cases of DHF in Phra Nakhon Si Ayutthaya Municipality, Muang Ayothaya Municipality and local tambon adminstration in the year 2013 was 99, 20 and 75 patients, respectively. Compare both municipalities to the total for the amphur was 119 patients which are divided by the total of 194 patients equally 61.3%. The higher ratio number of DHF in municipality was represented by ineffectiveness in controlling in DHF. In 2013, total dengue patients were 724 patients. The ratio of dengue patients between Amphur Phra Nakhon Si Ayutthaya and total dengue patients in Phra Nakhon Si Ayutthaya Province was 26.8%. Number of dengue patients classified by amphurs in Phra Nakhon Si Ayutthaya Province from 2007-2013 (Table 2.1).

Table 2.1 Dengue cases distributed by amphurs in Phra Nakhon Si Ayutthaya Province from year 2007-2013.

Amphur/year	2007	2008	2009	2010	2011	2012	2013
Tarua	30	50	6	9	17	6	4
Nakorn luang	31	30	7	17	16	13	18
Bangsai	6	21	7	7	3	3	9
Bangsi	27	21	28	14	37	7	33
Bangban	70	92	28	18	20	30	15
Bangpahun	16	52	19	14	28	38	33
Bangpa-in	65	237	88	95	101	46	140
Banprag	4	59	12	11	13	6	6
Phughai	17	5	1	3	1	2	31
Phra Nakhon Si	300	551	203	275	268	330	194
Pachee	14	19	6	18	11	14	18
Maharat	16	11	7	4	18	29	8
Ladbualuang	20	17	9	2	21	38	60
Wangnoi	56	99	63	23	65	42	107
Sana	72	145	11	27	28	22	26
Uthai	31	67	16	32	38	24	22
Total	775	1476	511	569	685	650	724

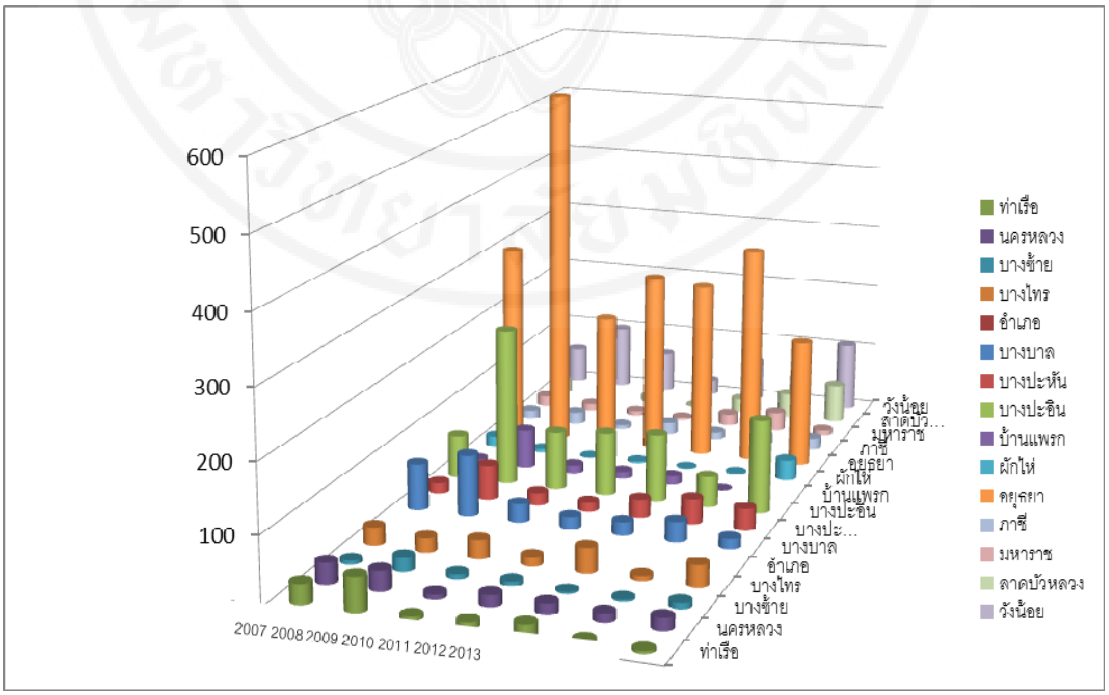

Figure 2.2 Dengue cases in Phra Nakhon Si Ayutthaya Province distributed by amphur between the years 2007-2013.

Table 2.2 Cost of dengue treatment in baht for Phra Nakhon Si Ayutthaya Hospital in total and average (16).

Year	Number	Total (baht)	Average (baht)
2011	816	4,851,998	5,946
2012	287	1,263,831	4,403
2013	853	3,217,928	3,772

This table 2.2 shows that dengue infection accrued a high expense for every year. Average expense tends to decline which shows that knowledge for both medical staffs and patients have improved.

Table 2.3 Distribution of age in three levels, country, province and amphur of Phra Nakhon Si Ayutthaya, Thailand in the year 2013 (7,10).

Place/Age	<5 yrs	5-9 yrs	10-14 yrs	15-24 yrs.	25-34 yrs.	35-44 yrs.	> 45 yrs	Total
Thailand	11,159	18,152	32,711	44,840	20,634	11,955	14,299	153,750
Province	41	75	137	234	129	58	50	724
Amphur	8	23	38	73	28	14	10	194

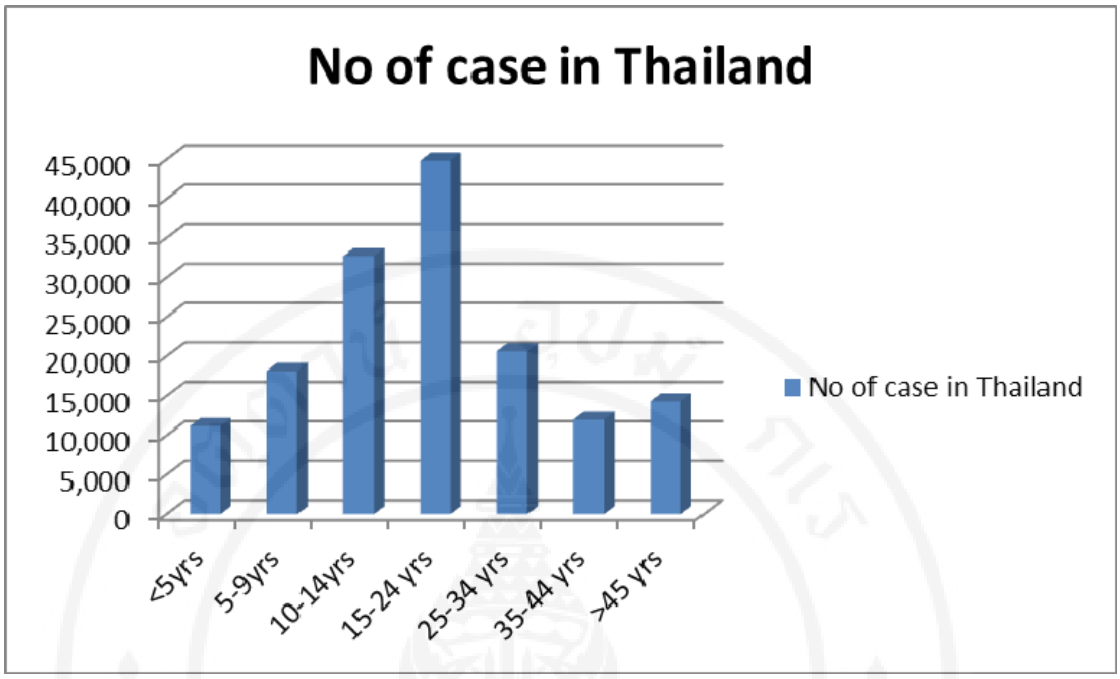

Figure 2.3 Distribution of age in three levels, country, province and amphur in the year 2013.

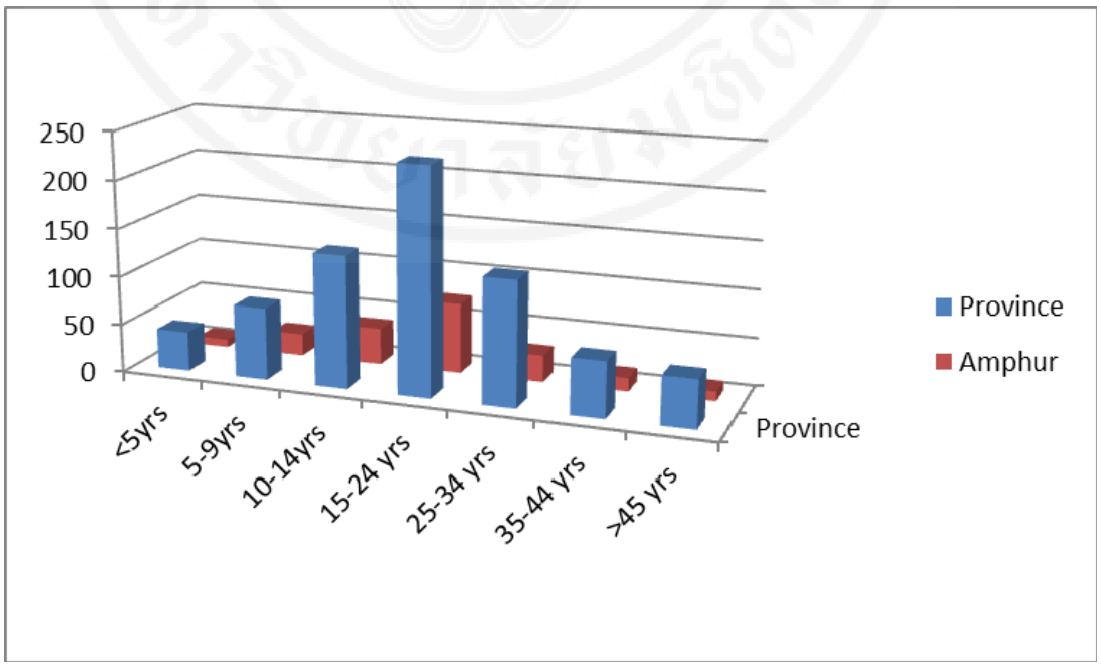

Figure 2.4 Age distribution for dengue infection in Phra Nakhon Si Ayutthaya Amphur and Province.

Table 2.3 and figures 2.3, 2.4 showed that the majority of infected patients were 15-24 years old.

Table 2.4 Dengue cases in Amphur Phra Nakhon Si Ayutthaya from year 2007-2013(10) compared between Phra Nakhon Si Ayutthaya Municipality (PN Mu), Muang Ayothaya Municipality (MA Mu) and local administration (local).

Year	PN Mu	MA Mu	Local	Total	%
2007	101	22	180	303	40.6
2008	192	54	289	535	45.9
2009	69	25	71	165	56.9
2010	105	56	114	275	58.5
2011	108	40	120	268	55.2
2012	129	30	171	330	48.2
2013	99	20	75	194	61.3

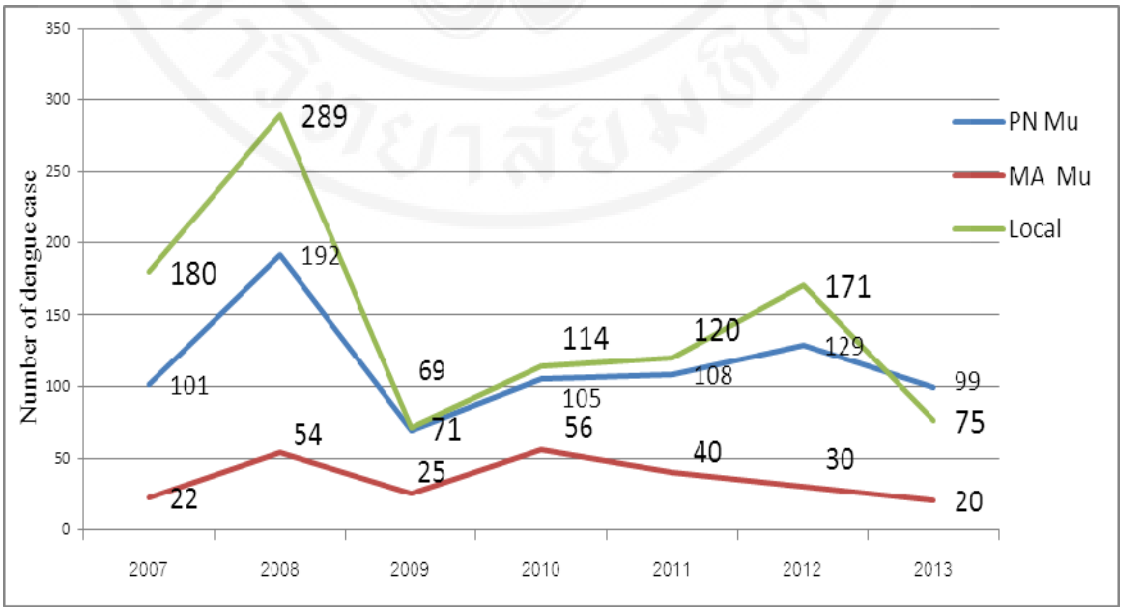

Figure 2.5 Present Dengue case in Amphur Phra Nakhon Si Ayutthaya divided by Administration of patients

Table 2.5 Dengue patients in the year 2013 in Amphur Phra Nakhon Si Ayutthaya were classified by age and administration (Phra Nakhon Si Ayutthaya Municipality (PN Mu), Muang Ayothya Municipality (MA Mu) and local administrative of Tambon (local))

Adm/ Age	<5 yrs	6-14 yrs	15 -24 yrs	25 -44 yrs	>45 yrs	Total
PN Mu.	4	25	36	29	5	99
MA Mu.	1	2	11	3	3	20
Local	5	32	26	10	2	75
Total	10	59	73	42	10	194

Despite having spent a long time in the control of DHF. Phra Nakhon Si Ayutthaya Province still has a high incidence of DHF, especially in Phra Nakhon Si Ayutthaya Municipality. Incidence in 15-24 years old people was 37.6%, while for children less than 15 years old was 35.6%. Tendency epidemiographic change from children to young adult.

2.2 Dengue Hemorrhagic Fever (3, 5)

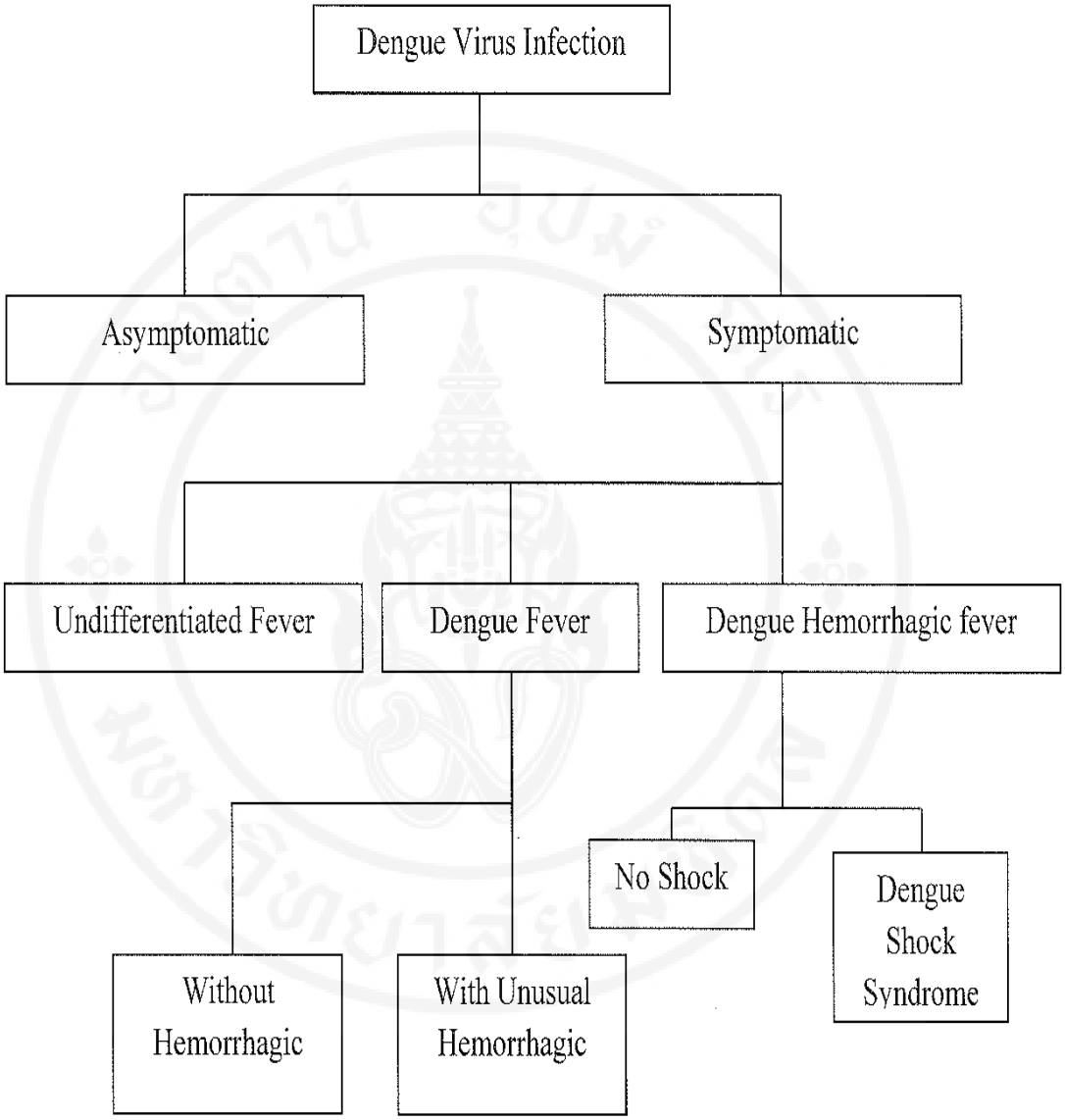

Figure 2.6 Manifestation of dengue infection

Dengue virus is RNA virus that is transmitted by the Aedes agypti mosquito. Mostly Dengue virus infections are asymptomatic. Symptomatic patients can be clinical ranging from undifferentiated fever, Dengue fever, Dengue hemorrhagic fever and Dengue Shock Syndrome as seen in the diagramme. Dengue fever (DF) most commonly occurs in older children and adults. DF is a primary infection that combines acute fever with two or more symptoms: headache, myalgia, arthralgia, and retro bulbar eye pain. Leakage of plasma caused by hemoconcentration that cannot be found in DF. Leukopenia and thrombocytopenia is usually found in DF. DF is rarely severe except when traumatic bleeding occurs.

Dengue Hemorrhagic fever (DHF) most common occurs in children under 15 years of age. However, DHF nowadays, tends to occur in young adults due to epidemiology change since 1982 (17). WHO criteria is used to diagnose DHF with an accuracy of more than 90% (3). DHF is a secondary infection that causes an immune response process caused plasma leakage. The immune process may cause plasma leakage and abnormal hemostasis which are the main pathophysiological changes in hemoconcentration and thrombocytopenia.

WHO criteria (3)

1. Fever 2-7 days
2. Abnormal bleeding at least a Tourniquet test positive with more than 20 spots per square inch
3. Hepatomegaly and tenderness
4. Hemodynamic instability or shock

In addition, the laboratory finds hemoconcentrate (Hct) had risen more than 20% from the baseline or contain signs of leakage such pleural effusion ascites and thrombocytopenia with platelet counts less than 100,000 cell/mm3.

Clinical criteria 4 plus 2 labs in WHO criteria are more accuracy than 90%. Though now in the first few days diagnosis of acute dengue infection, NS1 Antigen test can be used (18). Evaluation of NS1 Antigen test in acute phrase is more sensitive and specific than ELISA test (19). Dengue NS1 Antigen test may be suitable for first line testing in early diagnosis which is useful for epidemic case control and early treatment in order to reduce morbidity, mortality and inappropriate antibiotic use (18,19). But the Dengue Antigen test is limited for early diagnosis dengue infection

and not distinguished for in serotype and severity of infection. The cost – benefit analysis for in Thailand currently may be necessary for general management with an exception for controversial cases.

Dengue shock syndrome (DSS) is a more severe form of DHF that include severe plasma leakage caused by hypovolemic shock. If the shock cannot be promptly corrected it may lead to disseminated coagulopathy that can caused massive bleeding. Morbidity and mortality is usually found in DSS. WHO criteria are effectively used worldwide from past to present, but TDR (Tropical Dengue Research) adapted a new definition in the year 2009 from DF, DHF and DSS to dengue without warning sign, dengue with warning sign and severe dengue (20). The revised WHO dengue case classifications are beneficial for triage and more sensitive for detection of early severity of disease, but in many cases will come to the hospital (20, 21, 22). Kalayanarooj S (23) studied the classification dengue to compare the effectiveness in clinical management between the WHO criteria in 1997 and the recently revised WHO classification in 2009 (TDR). The research found that the set first one is more cost effective than the new set. Vomiting and abdominal pain are warning signs of dengue cases that are severe (23).

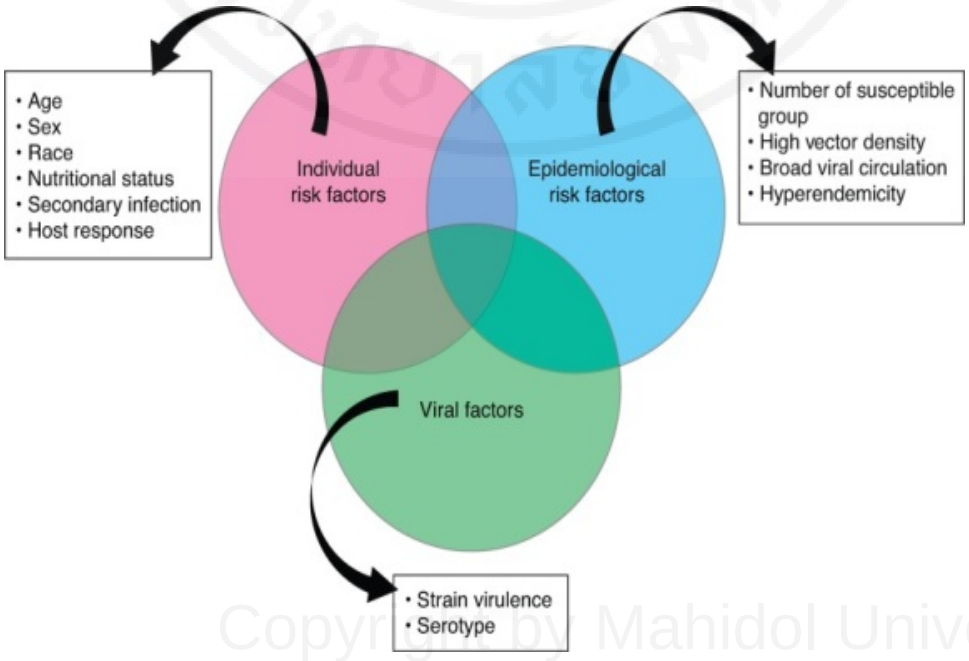

Figure 2.7 Composition of dengue infection.

Figure 2.7 shows that the composition is a dengue infection. It was composed of 3 factors that influenced dengue infection and epidemic. It needed a virus factor in another 4 serotypes: host factor in age, nutritional status, immune response and epidemiological risk factor in density of vector, susceptible group and hyperendemicity.

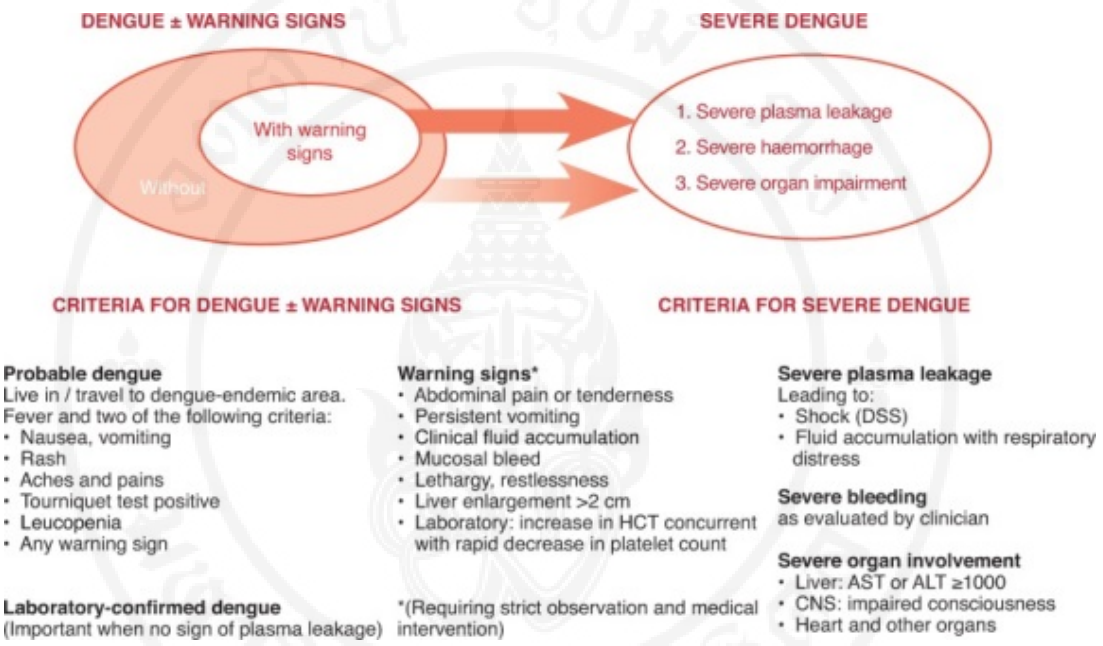

Figure 2.8 Warning signs of dengue infection (20)

Figure 2.8 shows the warning signs that the infection may be severe dengue later. Warning signs usually concern gastrointestinal symptoms such as abdominal pain, persistent vomiting and hepatomegaly, clinical bleeding and clinical fluid accommodation.

2.2.1 DHF (3) is classified in 3 stages

1. Febrile stage 2-7 days

2. Critical period 24-48 hours in which a few patients develop hypovolemic shock

3. Convalescent stage, the patients usually recover with increase Appetite, diuresis, and convalescence rash

In the critical period, the fever of patients mostly decline. Hemoconcentrate and platelet count less than 100,000cell/mm3 indicate that the patient is in the critical period with the leakage process ongoing.

2.2.2 Grading the severity of DHF (3)

DHF is classified for in severity in 4 grades. The classification for severity of DHF is:

Grade 1 WHO criteria plus hemorrhagic manifestation by positive tourniquet test

Grade2 WHO criteria plus hemorrhagic manifestation by spontaneous bleeding

: bleeding per gum, epistaxis, and upper gastrointestinal bleeding.

Grade3 WHO criteria and signs of circulatory failure (weak pulse, tachycardia, narrow pulse pressure, hypotension)

Grade4 WHO criteria with profound shock (undetectable pulse and blood Pressure) DHF grade 3 and 4 are called DSS.

2.2.3 Transmission of dengue virus (3)

Aedes agypti mosquitoes especially females are the principal vector for dengue transmission. Aedes albopictus mosquitoes are the second vector for dengue transmission. The incidence of dengue infection depends on seasonal variation, especially warm weather (24). Climate that change are changing due to global warming which has risen 10 degree celsius has the increased the transmission rate 2.4 times. There is increase transmission of the longevity of female mosquitoes, the time interval between bites and the extrinsic incubation period of the virus (25). Warmer temperatures and humidity influence vectors, viruses, human biology, ecology and consequently the intensity and distribution of the vector-borne diseases, especially an increase in dengue transmission. Assuming an increase in temperature of 3.3 degree celsius, in the same conditions will cause an increase of 16,030 dengue cases in Dhaka, Bangladesh (26).

2.2.4 The vector

Aedes agypti (3) is the most efficient vector of dengue virus to human transmission. Aedes agypti is highly anthropophilic, lives indoor and has a proximity to humans. They usually like places which are dark and moist. While the other species such as Aedes albopictus, Aedes polynesiensis and Aedes scutellaris have also been incriminated as secondary vectors. The female mosquito prefers to lay eggs on the surface with high degrees of dark color, roughness, and water absorption, especially cement containers and old tyres. Water jars usually are the breeding sites of mosquito (27). Aedes agypti usually lay eggs on clean stagnant water, especially man made containers. The eggs can be tolerated in long periods of desiccation, sometime for more than one year. Scrubbing of water containers can reduce Aedes eggs that stick to the inner surface of the water container. Dickin et al (28) used water-associated disease index (WADI) in Malaysia in order to find high vulnerability to dengue in urban areas, especially in the capital Kuala Lumpur and the surrounding regions to control the vectors of dengue.

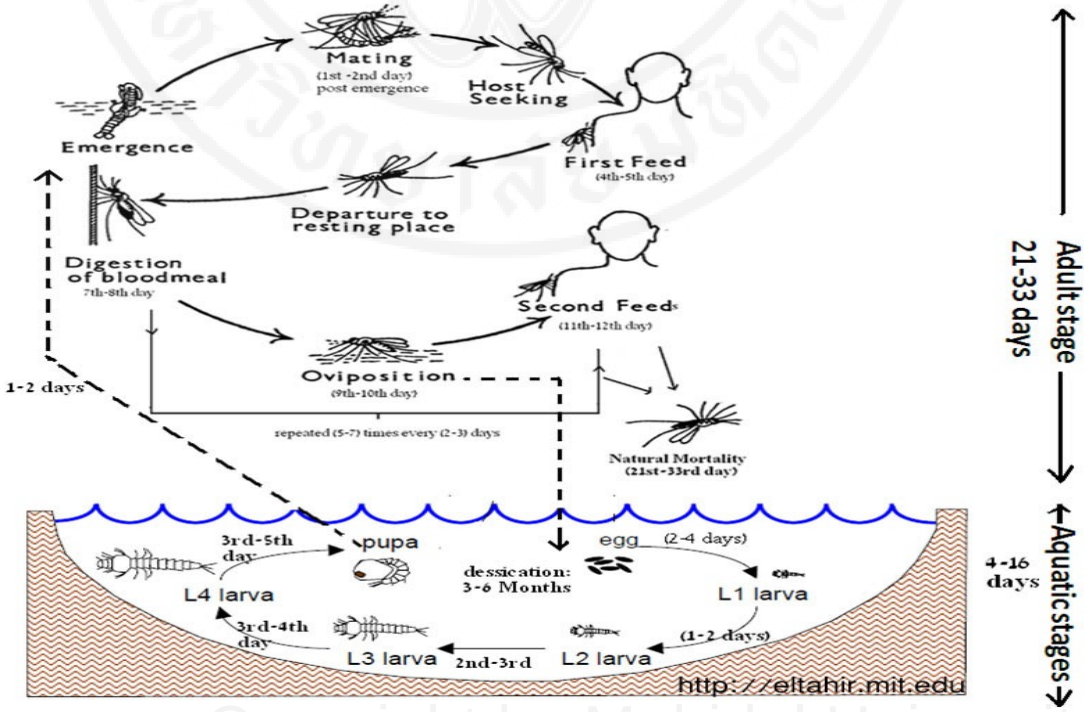

Figure 2.9 Life cycle of Aedes agypti (3)

Aedes agypti go through four district stage of development during life time, like complete metamorphosis. The four stages are egg (1-2days), larva (7-10days), and pupa (1-2days) and adult (male 7 days, female 30-45 days) respectively. Biting activity of female mosquitoes that need human blood to fertilize egg is during the day time, especially around 9-11 am. and 1-3 pm. While male mosquitoes like to drink sweet water from flowers. After drinking blood, female mosquitoes can lay a raft of eggs 50-150 eggs depending on derived human blood or the maturity of the mosquito breeder in standing water or very slow-moving water. Aedes agypti can fly within one kilometer, mostly 50 meters near their habitat. After biting humans, it usually stays on hanging things indoors, like cloth, curtain or used cloth. Cold weather under 20 degrees Celsius can extend the timing to lay egg from 4 days to 27 days. Female mosquitoes usually use their legs on the roughness of the container to stabilize it to lay eggs on surface of water that is why scrubbing the water container can reduced the number of larva in the breeding site. Survey breeding site of Chareonviriyaphap et al (27) of mosquitoes in 5 regions found that in south, 66.3% of mosquitoes found outdoors. Central region found 86.8% outdoor and 13.1% indoor. Endemic areas such in the central region, the outdoors should also be emphasized to eradicate this breeding site.

2.2.5 The Host

Humans are the main reservoir of dengue virus (3). Four serotypes of dengue virus can cause DF, DHF and DSS. After the first infection called dengue that produces lifelong immunity to this infected serotype, but temporary and partial protection against the other three serotypes. The sequential infection after a short time of primary infection can lead to a secondary infection known as DHF that clinically leakage. Transmission of dengue virus from infected human to adult female mosquitoes was determined by the magnitude and duration of viremia of the infected human.

2.2.6 Treatment

No specific drugs for dengue infection are available currently, only supportive treatment is the mainstay of treatment in all stages of DHF (3, 22).

Antipyretic like paracetamol should be recommended only when the temperature is more than 38.5 degree celsius because of hepatic impairment in dengue infection. Aspirin or brufen are contraindicated due to the side effect of gastric bleeding. Oral replacement therapy with electrolyte is suitable for the mild form of DHF grade 1, 2 in febrile and critical stage. Intravenous therapy may be necessary in severe plasma leakage for DSS in critical stage. Timing and duration of fluid therapy is significant to reduce morbidity and mortality in DHF patients. Intravenous fluid therapy should be administered in the critical period between 24-48 hours to reduce morbidity and mortality. Kind and rate of fluid therapy is important to reduce morbidity and mortality in DHF, too. Platelet transfusion (29) is rarely indicated due to significant thrombocytopenia except due to significant bleeding because of the immune process. Recombinant factor VII was used in severe bleeding (30). Total exchange or continuous replacement therapy was be used in severe form that have encephalopathy or fluid overload. Dengue vaccine is now in process of experimentation and testing. However, they are not currently available for use (31).

2.2.7 Preventive behaviors against dengue infection (3)

Combat to dengue vector, like Aedes agypti mosquito seems to be the primary method that is cost effective in preventing dengue infection for the present. Four methods, such as environmental management, personal protection, biological control and chemical control have been assessed that safe, cost-effective, practical and environmentally accepted.

2.2.7.1 Environmental management

Dengue vectors, like the aedes species usually breed in stagnant clear water, usually in man-made containers. Environmental management can reduced the breeding site of dengue vectors and human to vector contact. This can be categorized as environmental modification and manipulation.

Environmental modification should be first well- designed for the community before put in to use. Water supplies should be delivered in sufficient quality, quantity and consistency in term of time and normal pressure used in order to reduce water storages. However, in general water supply systems still have problems like inadequate water supply, low pressure, and limited time for use which persuades

the use of water storage containers. Man-made water storage containers are the major breeding sites of dengue vectors (27), which is why breeding sites cannot easily be eradicated. Other water storages, like overhead tanks, cisterns and masonry chambers of pipe waterlines should be mosquito proofed by covering the tank with a lid or sluice valves. Waste management systems should be checked every day. Garbage should have been covers, too.

Environmental manipulation should be designed before utilization, like good drainage of pipes on rooftops, sunshade and porticos in order to reduce water collection that may be a breeding site of the dengue vectors. Well-designed water drainage system that does not cause water collection is necessary to reduce breeding sites. In addition, domestic household containers are the major breeding sites of Aedes agypti in most urban area of south east Asia. Tight-fitting lids or screens should to cover water storages regularly. By cover it should also be emphasized that is covered tightly. Other water collection containers like vases, ant traps, flower pots and evaporated water storages under refrigerator, and air conditioners are major breeding sites of mosquitoes and should be changed, drained and scrubbed regularly every week. Due to the life cycles of larva stage which is about 7-10 days, in order to get rid larva this action must be done. The other hand, water collection is necessary in fire prevention regulations or in construction sites that need mandatory water storage. Such storages need to be kept mosquito-proofed. It should be kept tidy outside to reduce breeding sites of mosquito. Used automobile tyres are also common breeding sites of dengue vectors that prefer darker like black in environments. They should be kept under cover to prevent any rain water collection or modified to be a flowerpot that be a filled with earth. Used cans, glass bottles and other unused small water containers should be kept dry to reduce breeding sites. They may be buried in landfills, crushed or recycled in for use. Unexpected water containers such as hollow trees like bamboo that is used to make fences may be another larva habitat. It should be divided or filled with packed sand to eliminate potential as a larva habitat.

2.2.7.2 Personal protection

Mosquitoes prefer to bite arms and legs, especially warm-temperature people. They usually like darker colors. Clothes can reduce the risk of

mosquito bite. These clothes should be significantly thick and fit. The color of the clothes should be in bright, and not dark. Personal protection can be performed in various ways, like using repellents, wearing bright color long sleeves and trousers or impregnating clothes with chemicals, sleep in nets and use chemical insecticide products. Household products for insecticide, e.g. mosquito coils, pyrethrum space spray and aerosols have been extensively used in personal protection against mosquitoes. Repellents are very common for personal protection and are nowadays classified from origin into 2 categories, natural and chemical repellents. Lemongrass extract is the main natural repellent ingredients to prevent mosquito bites. Chemical repellents such as DEET (N, N-Diethyl-m-Toluamide) can protect against aedes species few hours. Sleeping in nets all the time should be recommended. New technology include impregnation with chemicals especially permithrin to curtains, nets and clothes. Limitations for the use of impregnated nets and curtains are that it may be only used during the daytime. However, it is effective for people who sleep in the day time, like night workers, infants and the elderly.

2.2.7.3 Biological control

Biological control (3) was applied to the larva and pupa stage of dengue vector which is not used worldwide. This control includes larvivorus fish to eat larva stage and endotoxin producing bacteria to kill of larva stage. Gambusiaaffinis and Poecilia reticulate have been extensively used in south east Asia as larvivorousfishs to control dengue vector, especially in larval stage. Bacillusthuringiensis serotype H-14 (Bt.H-14) is species specific to Aedes agypti and An. Stevensi, while Bacillus sphaericus (Bs) specific to Culex mosquito. (Bt.H-14) has been accepted for mosquito control in domestic use, due to low-level of toxicity to humans.

2.2.7.4 Chemical control

Environmental sanitation is a better way to eliminate larva than chemical control. Chemical control may be needed in special situations such as controlling epidemic situations or limitations on cleanup water containers. Chemical insecticides may be used for dengue-vector prevention and control. It should be integrated to the environmental methods wherever possible. Difficult cleanup of domestically used containers may be necessary using chemical larvicide for treating

water, temephos for larvicidal elimination. Chemical control (3), nowadays, consists of peridomestric space spraying, ultra-low volume spraying with organophosphate for adulticide of mosquitoes. Currently, larvicides are composed of 1% temephos and intrinsic growth regulators (IGRs). Temephos is comprised of 1% sand granules dosage of usage 1 ppm (parts per million) has an effect for 8-12 weeks, especially in porous earthen jars, under normal use. Temephos is not favorable for use due to its unpleasant odor and expensive cost. However, it has low toxicity. Intrinsic growth regulators interfere chitin synthesis during the molting process of larva, pupa and adult mosquitoes. Both temephos and intrinsic growth regulators have low toxicity towards mammalians.

Esu et al (32) conducted a systemic review on the evidence of effectiveness of peridomestric space spraying of insecticide in reducing and interrupting dengue transmission. Although peridomestric space spraying is usually applied by national dengue control programmes, the effectiveness of this intervention was rarely evaluated. There is no evidence of recommending peridomestic space spraying as a single, effective control intervention. Space spraying should be done integrated with other dengue control. Wilder- Smith et al (33) studied the impact of insecticide treated uniforms of school students to prevent dengue infection. However that study was not successful in results due to many reasons, eg length of clothes, duration per week, and warm weather.

Erlanger et al (34) conducted studies to compare the effects of different dengue vector control interventions, eg environmental management, biological control, chemical control and integrated vector management with entomological parameters; Breteau index (BI), container index (CI) and house index (HI). Fifty-six publications covered 61 dengue vector control interventions. Result found that integrated vector management was determined to be the most effective method for reducing the CI, HI and BI, with in effectiveness value of 0.12 (95% CI 0.02-0.62), 0.17 (95% CI 0.02-1.28) and 0.33 (95% CI 0.22-0.48), respectively. Environmental management showed relatively low effectiveness in CI, HI and BI were 0.49 (95% CI 0.3-0.79), 0.43 (95% CI 0.31-0.59) and 0.71 (95% CI 0.55-0.90), respectively. Biological vector control (relative effectiveness for CI: 0.18) usually targeted a small number of people compared to integrated vector control that focused

on larger populations. Dengue vector control is effective in reducing vector populations, particularly when interventions use a community-based, integrated approach, which tailors to local eco-epidemiological and sociocultural settings and combined with an educational programme to increase the knowledge concerning the best practice.

2.2.8 Impact of DHF

2.8.1 Economic impact of DHF

Economic burden has both direct and indirect costs. Average cases mostly were admitted 48-72 hours, during the critical period (3). Severe cases may stay in the hospital for more than the average due to clinical fluid overload. Direct costs consist of daily hospitalization cost, the unit cost of ambulatory care that includes consultation fees, tests performed, and treatment costs that multiply with the average number of visits. Other non-medical direct costs are the transportation costs of family. While indirect costs consist of reduction in work productivity, reduction of household service, loss of schooling, and increased need for care givers. Carrasco et al (35) had studied that in Singapore, despite good vector control, the average economic impact of dengue illness from year 2000 to 2009 ranged between $ 0.85 billion and $ 1.15 billion, of which control costs constitute 42%-59%. Disability-adjusted life years (DALYs) were 9-14 DALYs per 100,000 habitants which is comparable to hepatitis B or syphilis. Dengue vaccine are expected to be cost-effective if reasonable are established for the price of the vaccine which help to reduce the economic and disease burden of dengue in Singapore substantially. Beaute et al (36) had studied in Cambodia which has poor health care and economics country. Mean cost per dengue case were 36 dollars, and 75 dollars in the years 2006, and 2008 respectively. In Cambodia, patients sustain the highest share of total cost at 78% and 63% of the direct medical cost. Health seeking behavior held a major impact on cost. Okanurak et al (37) studied the access of the economic burden of DHF patients on the Thai government for prevention, control and treatment of DHF. Caretakers reported 184 burden patients who were admitted in three hospitals, Children's hospital Bangkok, Suphan Buri hospital and Don Chedi hospital in district in Suphan Buri province. The study found that the direct cost which include treatment cost and the cost of travel,

food, and lodging was 66.99 US$, 61.02 US$ in Bangkok and Suphan Buri, respectively. While total costs included the direct cost and opportunity cost were 118.29 US$ in children and 161.49 US$ in adult in Bangkok compare in Suphan Buri were 102.82 US$ in children and 138.02 US$ in adults. The net hospital cost for each DHF patient was 54.6 US$, and 38.65 US$ in Bangkok and Suphan Buri respectively. In year 1994, expenditure in dengue prevention and control was 4.8724 million US$, while expenditure for dengue treatment was 12.596 million US$ (54.8% from government budgets and 45.2% paid by the families). The study concluded that recording expenditure should be taken into account to include that from the government and the patient costs, direct and indirect. Kongsin et al (38) reviewed the cost of non-fatal cases of dengue infections in Khon Kaen hospital in 2005 which averaged 573$ (+351), This was determined to be very high cost. Costs in prevention and control programme have been high proportionately since from the past to the present, which means prevention and control are still problems. Community participation nowadays is cost-effective for in dengue prevention and control, as in the study of Kittayapong et al (9). Local communities in collaboration with the local administration of public health in the Plaeng Yao District, Chachoengsao were studied about vector management measures, eg cleanup campaign before the rainy season, screen covers for water jars, and routine garbage pickup.

2.2.8.2 Impact on society

Gopalan et al (39) conducted a study in Chikunkunya, India which not only the cost of investigation but also loss of productivity. Damme et al (40) conducted a study to interview 72 households about health-seeking behaviors, out of pocket expenditures and the financing of such expenditures in Cambodia for the year 2004. Expenditure mostly depended on where the patient sought care by households. Borrowing money with high interests was inevitable in some households. That expenditure may lead to poverty in some households. One year later, 26 households with initial debt had already coped by selling consumables and assets. Most families with initial debts had been unable to settle these debts and continued to pay high interest rates. Conclusion determined that expenditures in health frequently caused indebtedness and poverty.

2.3 Health Belief Model (HBM) (11, 12, 41)

Health Belief Model was developed by Kurt Lewin during the 1950s is cognitive theoretical model. This model explained the reason why some people were motivated to do preventive behavior, and why some failed to do the same behaviors. Preventive behavior derived from threat perception to disease and benefit to take this preventive behavior compared to the barriers. Perceived susceptibility (perceived personal likelihood) meant vulnerability to concerned disease. That is one factor that can influence what people decide and is included in most theories of health behavior. Perceived seriousness or severity of disease is determined a show the disease may affect towards disability or death. Severity evaluation of disease depended on the degree of emotional arousal created by the thought of having the disease or by medical or social difficulties. When people perceived in the severity of the disease it influences them to do preventive behavior to protect them. Many studies showed that perception in severity positively related to preventive behavior. Perceived benefits are beliefs about the effectiveness to do recommended actions in preventing the health threat. Beliefs that recommend action were beneficial for preventing health hazards. Decision is made for preventive behavior when comparing risks and benefits, which prefer the benefits than risk. Perceived barriers mean potential negative aspects of taking action to perception concern, like expense, danger, unpleasantness, inconvenience, and time required. Demographic, sociopsychologic, and structural variables affect the tendency of action that is related to the perception of threat. Health Belief Model is model that is appropriate to the paradigm of disease-preventing behaviors (42). Perception in barriers are the most powerful for health belief model to explain various health behaviors. While perceived susceptibility is important to understand the disease in order to do preventive behaviors.

Health Belief Model was successfully used to modify behavior that applied to the evaluation of intension to use condoms in students of Gselassie et al (43) if there is a high perceived susceptibility and high self-efficacy, then subjects were more likely to have an intention to use condom more than others. Behaviors of humans influenced by socioeconomic, cultural and political factors can increase or decrease dengue transmission by vector control though, a dengue vaccine is currently not in use. A study in the belief of the effectiveness of the dengue vaccine can reduce vector

control behaviors significantly compare to the group which believes in the ineffectiveness of the vaccine (44).

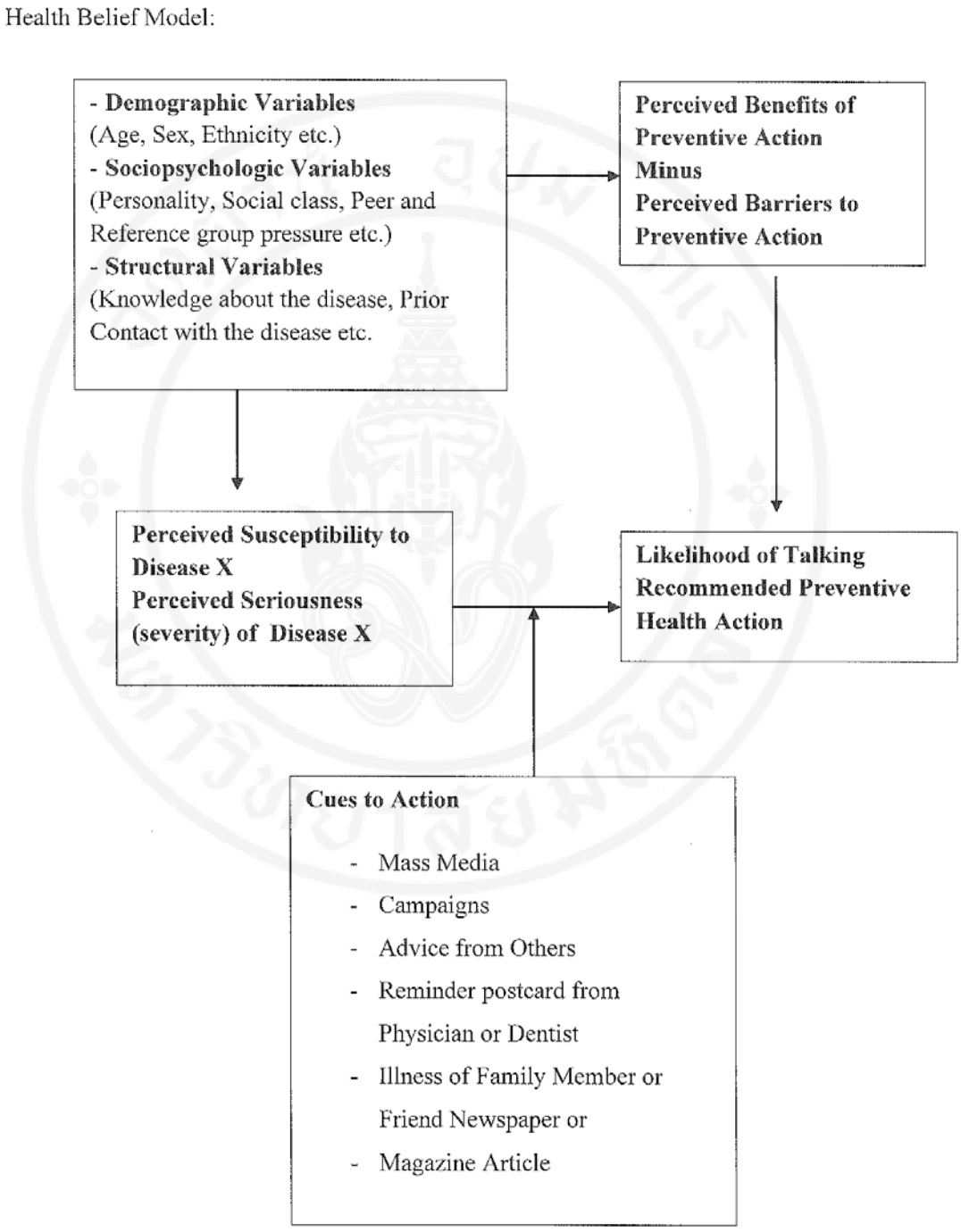

Figure 2.10 Health Belief Model

Health Belief Model was applied to this study for the conceptual framework that relates socio-demographic variables, knowledge variables, perceived susceptibility, perceived seriousness, perceived benefits, and perceived barriers to preventive behaviors and a cue to action to DHF preventive behavior which have independent factors to dependent factors of DHF preventive behavior.

2.4 The Related study

2.4.1 Socio-Demographic Factors

2.4.1.1 Age

Most studies showed that age is one of factors that relates to the knowledge of DHF. Since DHF is major problem in Thailand, health education was applied to student's curriculum. Success in prevention and control of dengue should be applied this health project to students (45). Wong et al (46) found that older age and younger adults held low perception in susceptibility than other age groups. Van Benthem et al (47) conducted a study in three areas of northern of Thailand in 2001. The study found that the knowledge of dengue significantly differed by age, sex, and occupation. Younger participants (15-29 years old) had more knowledge about dengue than older participants (more than 60 years old). Age and education level were found to be related to preventive behavior in DHF among the people of Muang Suphan buri Municipality where the study was conducted by Putkhuntod R ST(48).

2.4.1.2 Sex

Van Benthem et al (47) found that woman like housewives had relatively little knowledge of dengue. Sakai et al (49) showed that sex was not related to preventive behavior in dengue infection among migrants in Samut Sakhon.

2.4.1.3 Marital status

Married people with children in the family tendency to have higher preventive behavior in DHF than single or separate people.

2.4.1.4 Education level

Education can help people to formulate ideas, thinking and attitude. People who have a high education level usually have more chances to learn

about disease and health care in various ways compared lower than low education levels that developed skills in various aspects; like attitude, moral principle and behavior (50). Al-Dubai et al (51) conducted a study with 300 participants from three different geographical setting in urban, semi urban and rural areas in the state of Selangar and Kuala Lumpur, and found that the attitude significantly relates to with education level and employment status. Putkhuntod R ST (48) found that education level related to preventive behavior in dengue hemorrhagic fever in Muang Suphan buri Municipality. Ibrahim et al (52) studied in 3 groups, high school females, teachers and supervisors concerning knowledge about dengue fever in Jeddah and found that students had the lowest mean knowledge score when compared to the other two groups.

2.4.1.5 Occupation

Van Benthem et al (47) conducted study in three areas of northern Thailand in 2001. The study found that knowledge of dengue significantly differed by age, sex, occupation.

2.4.1.6 Income

Adequate income of family was related to preventive behaviors in families dengue hemorrhagic fever in Muang Suphan Buri Municipality. A study conducted by Putkhuntod R ST (48) and Huff RK (50) found that income is associated to wealth and health care condition. Higher income usually associates with better quality of life, better environment, education and medical care (53). Teetipsatit S (54) conducted a study on family leaders found no significant correlation between income and preventive behavior. Employment status was found to be significantly related to attitude in dengue fever in the study by Al-Dubai et al (51).

2.4.1.7 Family pattern

This is divided into three patterns, extended family, single family and single person. Extended family tended to have high preventive behaviors due to many generations living together. However no study was not supported now.

2.4.1.8 Duration of stay

Duration of stay was found to be significantly associated to DHF preventive behavior for migrants in Samut Sakhon of study of Sakai et al (49) since migrant may not be familiar to the environment in Thailand. This study found

that migrants who stayed in Thailand less than 36 months had more preventive behaviors than who stayed live longer.

2.4.1.9 Religion

Religion was determined to affect DHF preventive behavior. Teetipsatit S (54). conducted a study on family leaders in Ban Chang-Lo, Bangkok and found that religion was significantly associated with DHF preventive behavior.

2.4.2 Knowledge

Itrat et al (55) conducted study interveiw 447 participants in Pakistan, found that literate people were more well-informed about dengue fever compared to illiterate people ($p<0.001$). Sufficient knowledge about dengue was found to be in 38.5% of the sample, with 66% of these in Aga Khan University Hospital and 33% in Civil Hospital Karach. Knowledge about preventive measures was found mostly towards prevention of mosquito bites (78.3%) rather than eradication of mosquito population (17.3%). Use of anti- mosquito spray was the most prevalent (48.1%) preventive measure. AI-Dubai et al (51) conducted study with 300 participants from three difference geographic settings in urban, semi-urban and rural areas within the states of Selangor and Kuala Lumpur. Common source of information of dengue infection was television in 97%. There was no significant association between knowledge and socio-demographic. Knowledge about dengue, age, marital status and geographic area were significantly associated to preventive practice in dengue fever. Lencova et al (56) studied that an increase in knowledge of dental carries prevention of Czech parents that concentrated in only tooth brushing in the past, lead to an increase in preventive behavior concerning dental carries on other methods like avoidance about non cariogenic diet and the role of fluoride supplement. Van Bemthem et al (47) reported people who knew about dengue used preventive measures more than people who did not known. Ibrahim et al (52) studied 3 groups, high school female, teachers and supervisor (2693 students, 356 teachers and 115 supervisors) concerning knowledge towards dengue fever in Jeddah, and found that students had lowest mean knowledge score when compared to other two groups. The predictors of high students' knowledge score were experience in dengue within the family, having

literate mothers, and an age of more than 17 years old. Predictors in high practice score received had greater knowledge scores.

2.4.3 Perception

Therawiwat et al (57) assessed the effective community base approach programme of dengue prevention in two villages of Mueang District, Kanchanaburi Province. Experimental group was identified as key stakeholders and regularity in empowered and active learning in the village in monthly meeting which significantly decreased in dengue parameters (HI, CI, BI) after the experiment. Knowledge, perception, self-efficacy and larval survey practice in experimental group were higher after the experiment. This research reflected in the importance of perception of community and regularity in monitoring as were key success factors in dengue control.

2.4.4 Cues to action

2.4.4.1 Advice from health care personnel as in Swaddiwudhipong et al (58) played an important role in disseminating DHF information and preventive method. Radio and television were the main effective mass media for public health in that time (58). Television was the most important for relaying information to the public as in the study of Al-Dubai et al (51) in Malaysia which found that 97% received information from television. Television was considered as the most important and useful source of information on dengue fever (55). In the future, social media may play an important role about public health and education. Social media, like Twitter was applied towards a dengue surveillance system (59). Aedes hotspot detecting by mobile phone was applied to dengue surveillance and control in Malaysia (60). Researchers at Nanyang Technological University (NTU) in Singapore have developed a social media-based system called Mo-Buzz that can predict where and when dengue might occur. Real time surveillance may be helpful to alert health care personal and households about controlling to control dengue spread (61).

2.4.4.2 Illness of family member. If family member had been admitted to the hospital, care takers had a higher response in prevention, control and treatment than non-case families. Kittigul et al (62) studied in 131 caretakers in 7

government hospitals in Angthong province about knowledge, attitude and practice regarding dengue hemorrhagic fever. The study divided into in 3 groups of caretakers of dengue cases: children, non-case dengue children, and healthy children and found the same level of knowledge about dengue hemorrhagic fever in the 3 groups. A higher response in prevention, control and treatment in dengue hemorrhagic fever in caretakers was found for these whose children were admitted to the hospital than other 2 groups significantly. (p value 0.000). Sakai et al (49) studied in migrant in Samut sakhon found that DHF patients in family significantly associated to preventive behaviors against DHF.

2.4.4.3 The larvicide for treating water, temephos is usually supplied by local administration of government. Although unpleasant odor and expensive cost, it is the other methods to eradicate larval stage of mosquito. Teetipsatit S (54) found that adequate resource in prevention of DHF, like mosquito net, cover and abate sand significantly associated to DHF preventive behavior among family leaders in Ban Chang-lo, Bangkok.

2.4.5 Preventive behaviors

Many studies showed that people mostly knew that dengue infection was transmitted by Aedes agypti mosquitoes. Common breeding sites usually mentioned were water jars and water retentions in households. Ant traps and cement bath were less usually mentioned, which means less interest was paid towards the two breeding sites (58). The most common practice was to cover water-drinking containers. Putted abates, temephos sand granule, and changing store water frequently used for non-drinking water was also done. Ant traps usually putted by abate, oil and detergent. O pisalsutthikul et al (63) studied in the Satun province regarding epidemic areas and non-epidemic area, found no difference in knowledge but a lack in prevention and control in the epidemic area. People living in the epidemic area perceived that prevention and controlling was the job of the health control officer. Preventive behavior was usually stimulated by health care volunteers or a campaign of Aedes control programme (38, 39, 40, 41, and 42). Community leaders, the chairman of the local administrative organization, public health officials, and community health volunteers were influential in changing the behavior of the people (63). Sakai et al

(49) studied preventive behavior in dengue of 176 migrants in Samut Sakhon province found that most migrants (71.2%) had poor knowledge but had a high perception towards DHF perception, a ratio of 64.77%. The most common preventive behavior was covering water containers. Least preventive behavior was using larvivorus fish to eat mosquito larva. A significant correlation between preventive behaviors against DHF among migrants were the duration of staying in Thailand, advices from doctors or family members, receiving information from TV, and experience about dengue patients among the respondents. More than three-fourths of respondents (76.14%) knew avoiding mosquito bite is the most suitable method of DHF prevention in this study. Itrat et al (55) found that preventive measures in Pakistan mostly tended towards the prevention of the mosquito bites (78.3%) rather than eradication of mosquito population (17.3%). Use of anti- mosquito spray was the most prevalent (48.1%) preventive measure.

CHAPTER III
RESEARCH METHODLOGY

3.1 Research design

Cross sectional descriptive design was done by self- administrative questionnaires to study the associated factors between socio-demographic variables, knowledge, perception, cue to action and preventive behaviors against DHF among people living in Phra Nakhon Si Ayutthaya Municipality of Amphur Phra Nakhon Si Ayutthaya of Phra Nakhon Si Ayutthaya Province.

3.2 Study area

People being permanent resident aged more than 18 years of age living in Phra Nakhon Si Ayutthaya Municipality are the respondents to this study. Illiterate people will be excluded from this study. In this study people should have lived in their households for more than 5 days a week and more than once per year. Comparisons between two municipalities in Amphur Phra Si Ayutthaya, Phra Nakhon Si Ayutthaya Municipality were selected because of high incidence in DHF and a higher population than Muang Ayothaya Municipality. In the year 2013, dengue cases numbered 194 cases (118 cases in municipality, 76 cases in local administration) were reported in Amphur Phra Nakhon Si Ayutthaya from the 724 cases in Phra Nakhon Si Ayutthaya Province. Dengue cases in year the 2013 in Phra Nakhon Si Ayutthaya Municipality and Muang Ayothaya Municipality were 99 and 19 cases, respectively.

3.2.1 Descriptive of Phra Nakhon Si Ayutthaya Municipality.

There are 57,037 people (49,204 persons more than 18 years old), 3,848 households that live in 9 tambons and 410 health care volunteers. The study population are people more than18 years old living in Phra Nakhon Si Ayutthaya Municipality of Amphur Phra Nakhon Si Ayutthaya.

3.3 Sample size (64,65)

$$n=\frac{Z^2NP(1-P)}{z^2\,P(1-P)+(N-1)E^2}$$

where

n = sample size

N = total number of study population aged more than 18 years old
= 49,204 persons (15)

Z = standard normal score at 95% of confidence interval = 1.96

P = the proportion of having poor preventive behavior, p = 0.5 (66)

E = acceptable error = 0.05

$$N = \frac{1.96^2\,(49{,}204)(0.5)(0.5)}{1.96^2\,(0.5)(0.5)+(49{,}204-1)(0.05)^2} = 384$$

The representatives of this study required are at least 384 persons. Only one respondent was randomly selected from each household. The sample size was increased by 10 percent in case of missing data or incomplete data during the collecting process. The total number of sample size in this study was 422. For the proportion of samplings to the population that each tampon was selected one from one hundred in population, 492 questionnaires were randomly distributed by healthcare volunteers.

Table 3.1 Distribution of people who 18 years old or older and calculated participants in Phra Nakhon Si Ayutthaya Municipality, classified by tambon (15).

Tambon	Health V*	House Hold	Population**	Participants
Hauratanachai	47	467	10,132	101
Huaraw	93	833	10,565	106
Tawasukree	66	721	7,424	74
Huntra	18	124	921	9
Pratuchai	147	1210	14,982	150
Ban Koh	12	150	1,281	13
Khlongsuanpoo	9	115	1,252	13
Kamung	9	114	1,597	16
Koh reign	9	114	1,050	10
Total	410	3848	49,204	492

Health V* Health care volunteer Population** people more than 18 years of age

3.4 Sampling technique

Phra Nakhon Si Ayutthaya Municipality was selected due to the basis of high incidence of DHF with highest crowded population in Amphur Phra Nakhon Si Ayutthaya. Stratified sampling was used to draw a sample. Nine tambons in Phra Nakhon Si Ayutthaya Municipality had 410 health care volunteers to take care of 3,848 household. The proportion of the population was calculated according to the number of respondents. Health care volunteers can should literate adults in their responsibility to this study through the random sampling technique.

3.5 Research instrument and measurement

Part 1: Socio-demograrphiccharacteristic: Age, sex, marital status, religion, income, occupation, education, characteristic of family and duration of stay.

- Age was categorized to 18-25 years, 26-35 years, 36-45 years, 46-55 years and more than 55 years.
- Gender is defined as male and female.
- Marital Status is defined as married, divorce and single.
- Education is defined by level of study separated into 4 categories as follows.

1. No education
2. Less than Bachelor's degree
3. Bachelor's degree
4. Higher than Bachelor's degree

- Occupation is defined as civil servants, business, employees, housewives and unemployed.
- Income is defined as income per month which is categorized into 3 groups as follows.

Low income	< 10,000 baht per month
Moderate income	10,000-20,000 baht per month
High income	> 20,000 baht per month

Mean average income for Thailand in the year 2012 was 10,616 baht per month per person. Average income in central region was 22,023 baht per month per person (67).

- Duration of stay is defined by the number of years that the respondents permanently lived in their residence.
- Family Pattern is defined as extended family (more than one generation) or nuclear family (one generation).
- Religion is categorized as Buddhist, Muslim and Christian.

Part 2: Knowledge regarded symptoms and signs, causes of disease, mode of the transmission of disease, treatment and preventive behavior in DHF were asked though questionnaires. There were 14 questions, each determined for one score. Classification in knowledge was classified in 3 levels using Bloom's cut off point: high level, moderate and low level, >80%, 61-80% and, <60% respectively (14).

Part 3: Perception was composed of susceptibility to disease, seriousness of disease, benefits in DHF prevention and barriers on DHF preventive behavior which used the 5 rating scales of Likert (68) as follows :

Positive statement		Negative statement	
Choice	Scores	Choice	Scores
Strongly agree	5	Strongly agree	1
Agree	4	Agree	2
Undecided	3	Undecided	3
Disagree	2	Disagree	4
Strongly disagree	1	Strongly disagree	5

All variables scores were summed up. Mean and standard deviation would be calculated. Variables categorized were cut off at 50^{th} percentile or above as high and below 50^{th} percentile as low. This part has 23 items with a minimal score of 23 and a maximum score of 115. Positive questions are 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, and 30 while negative questions are 15, 31, 32, 33, 34, 35, 36, and 37.

Part 4: Cue to action

Information from health care volunteers, mass media and others were cues to DHF preventive behaviors. Also, experience about disease from family members was asked in questionnaires as another cue to preventive behaviors. Chemical temephos called abate sand available in households is another cue to action regarding DHF preventive behaviors.

Part5: Preventive behaviors of DHF

Preventive behaviors was asked following health care campaign and other method continued 9 questions which are as follow covering water container, changing water weekly, biological larvicidal fish, destroying mosquito breeding sites, scrubbing water containers weekly, personnel protection like mosquito nets/screens, use of repellents and long sleeve clothes and regularity of practice in preventive behaviors. Scoring of each question was given as 5 levels in 4 scores which are:

Always	score(s)	4
Quite often	score(s)	3
Sometimes	score(s)	2
Rarely	score(s)	1
None	score(s)	0

Preventive behavior score was summed up and calculated to classify at 75^{th} percentile on to 2 levels (69) as good and poor.

1. Good level : more than or equal to the 75^{th} percentile or score above or equal to 2.91
2. Poor level : less than the 75^{th} percentile or score below 2.91

3.6 Sample inclusion and exclusion criteria

Sample inclusion criteria was adult aging 18 years old or older who permanent living in Phra Nakhon Si Ayutthaya Municipality more than 1 year. Adult who could not read and write were excluded from the study.

3.7 Validity and reliability test for questionnaire

After getting approval from Ethics committee at Phra Nakhon Si Ayutthaya Hospital (AY.004/2557), the questionnaire was pre-tested for obtaining reliability and validity. People in this study were self-administered questionnaires. Questionnaires plan to test reliability by Cronbach's alpha coefficient (70) and part of knowledge by KR-20 (71). In terms of content validity, the initial drafts of the questionnaires were revised according to the comments and suggestions provided by three experts. Unclear, misleading, highly sensitive and inconsistency questions were revised or deleted in order to improve the reliability of the questionnaires. They were then pretested on a sample of 30 subjects to establish their reliability. Some of the knowledge and perception items were revised to make some questions more simple and clear. The Kuder-Richardson (KR20) test for the knowledge part was 0.72. Cronbach's α coefficient for the perception part was 0.58.

3.8 Data collection Tools and methods

The structured questionnaire was designed and used for data collection. Questionnaire was applied from other researches. People in this study were self-administered questionnaires. Data collection was conducted July, 2014. After receiving permission from Ethics Committee of Phra Nakhon Si Ayutthaya Hospital, the data collection was undertaken following.

1. Contacted health care volunteers of Phra Nakhon Si Ayutthaya Municipality and informed the objectives of the study to collect data from sample population. Health care volunteers were discussed about questionnaires with researcher with unclear questions.

2. Health care volunteers randomly distributed questionnaires and consent forms to eligible participants who met inclusion criteria in Phra Nakhon Si Ayutthaya Municipality.

3. Incomplete questionnaires were excluded. After finishing the data collection, all data were categorized and put on SPSS, statistical programme.

3.9 Data analysis and statistic used

This research is a descriptive study which analyzed the significance level of 0.05 by Chi-square test.

3.9.1 All categorical variables were analyzed using frequency and percentage.

3.9.2 Mean and standard deviation were calculated for quantitative data such as Age, income, duration of stay, knowledge, perception and preventive behavior.

3.9.3 Associations between socio-demographic variables, knowledge, perception, cue to action and preventive behaviors were examined by Chi-square tests and Multiple Logistic Regression.

3.10 Ethical consideration

The participants were explained about the study by health care volunteers and informed consent paper. The participants were given the options to participate or refuse to take part in this study at any time. A written consent was obtained from each participant before administration of the questionnaires. All information of respondents was kept confidentially in order to protect their privacy.

CHAPTER IV
RESULTS

Aim of this study is to identify and find factors related to preventive behavior in Dengue Hemorrhagic Fever (DHF) for people 18 years or older that live permanently in Phra Nakhon Si Ayutthaya Municipality, Phra Nakhon Si Ayutthaya, Thailand. 492 questionnaires were distributed by health care volunteers who understand the criteria of this study to eligible people on July 2014. Only 422 questionnaires were returned with responses an 85.8% rate. The data were described by number, percentage, mean, standard deviation, minimum and maximum of values. Chi-square tests were used to determine the association between each independent variable and DHF preventive behavior. Multiple logistic regression was used to determine factors associated with DHF preventive behavior. The results are shown as the following:

1. Socio-demographic factors.
2. Knowledge about DHF.
3. DHF perception toward susceptibility, severity, beneficial prevention and barrier of DHF prevention.
4. Cue to action to prevent DHF.
5. DHF preventive behavior.
6. Association between study factors and DHF preventive behaviors.

4.1 Socio-demographic factors

Socio-demographic factors included questions about age, gender, marital status, education level, family patterns, occupation, income, religion and duration of residence. Data was classified to number and percentage. Socio-demographic factors are described in Table 4.1.

Table 4.1 Number and Percentage of Respondents by Socio-demographic factors.

Socio – demographic factors	**Number** (n = 422)	**Percent**
Age group (years)		
≤ 25	67	15.9
26 - 35	77	18.2
36 - 45	77	18.2
46 - 55	68	16.1
> 55	133	31.6
Mean = 42.7 , SD = 14.3 , Min = 18 , Max = 66		
Gender		
Male	93	22
Female	329	78
Marital status		
Single	142	33.6
Married	200	47.4
Divorced/ Widow/ Separated	80	19.0
Education level		
No education	12	2.8
Less than Bachelor's degree	317	75.1
Bachelor's degree	91	21.6
Higher than Bachelor's degree	2	0.5

Table 4.1 Number and Percentage of Respondents by Socio-demographic factors. (cont.)

Socio – demographic factors	Number (n = 422)	Percent
Occupation		
Employee	128	30.3
Civil servant	52	12.3
Business	108	25.6
Housewives	67	15.9
None	67	15.9
Income (Baht)		
Less than 10,000	287	68.0
10,000-20,000	105	24.9
More than 20,000	30	7.1
Mean = 10,719.2, SD = 4,925.6, Min = 6,000, Max = 30,000		
Duration of stay (years)		
25 and low	227	53.8
26 - 50	150	35.5
51 and above	45	10.7
Mean = 29.6, SD = 13.3, Min = 10.0, Max = 60.0		
Family pattern		
Nuclear family	282	66.8
Extended family	140	33.2

Table 4.1 Number and Percentage of Respondents by Socio-demographic factors. (cont.)

Socio – demographic factors	Number (n = 422)	Percent
Religion		
Buddhist	409	96.9
Islam	11	2.6
Christian	2	0.5

Table 4.1 shows socio-demographic factors of respondents. The mean age was 42.7 years old. Nearly one-third of respondents (31.5%) were more than 55 years old.

Most of the respondents (78%) were female and nearly half of them (47.4%) were married.

Most of the respondents (75.1%) did not have s bachelor's degree. A few respondents (2.8%) did not study.

One-fourth of respondents (25.6%) were local business while 33.3% were employees. 68% of respondents earned less than 10,000 baht per month. The average monthly salary was 10,719.2 baht. The average residency is 29.6 years. A large majority of respondents (96.9%) were Buddhists. About 66.8% were nuclear families. All socio-demographic factors including age, gender, marital status, education level, occupation, family pattern, income, religion and duration of stay were not significantly associated with DHF preventive behavior.

4.2 Knowledge factors of respondents about DHF.

The part of knowledge regarding DHF comprised 14 questions which covered cause, clinical symptoms, signs, DHF transmission, and vector control. For each question, respondents were given one point for a correct answer and zero for an incorrect answer. Scores, therefore, ranged from 0 to 14. The total scores of knowledge was classified into three levels according to Bloom's suggested cut-off points (14), a high level if the score was >80% correct, a moderate level was 60-80%

correct, and a low level was <60%. Table 4.2 shows numbers and percentage of respondents related to corrected answers. Knowledge of respondents was categorized as Bloom's classification in three levels in Table 4.3.

Table 4.2 Numbers and Percentage of Respondents Related to Correct Answer about Knowledge by Items.

Statements	Corrected answer	
	Number	%
1. Cause of DHF is virus.	385	91.2
2. Aedes agypti is carrier of DHF spreading.	419	99.3
3. Nowadays, DHF spread in every season.	76	18.0
4. Biting activity of Aedes agypti is daytime.	360	85.3
5. Water jar is breeding site for Aedes Agypti.	414	98.1
6. Eradication in larva stage is the simple way to get rid of mosquito.	205	48.6
7. Aedes agypti is not lay egg in the river.	357	84.6
8. Mucous diarrhea is not common symptom of DHF.	319	75.6
9. Fever reducing with brufen or aspirin is not recommendation for initial therapy of DHF.	240	56.9
10. Fever deference with abdominal pain is serious stage of DHF.	92	21.8
11. Headache is DHF symptom that not emergency to hospital.	88	20.9
12. Mosquito biting prevention is the best way to prevent DHF infection.	318	75.4
13. Breeding site eradication is duty of everyone in community.	348	82.5
14. Most important of initial treatment of DHF is forced oral fluid.	23	5.5

A large majority of respondents knew about the cause of DHF, Aedes agypti, and its breeding sites about 91.2, 99.3 and 98.1 percent respectively. Only one-

fifth (21.8%) knew that abdominal pain with fever deference was more emergent than headache (20.9%). Eighteen percent knew that DHF can spread in all seasons and oral rehydrating fluid was an important initial therapy for DHF (5.5%). (Table 4.2)

Table 4.3 Number and Percentage of Respondents by Levels of Knowledge about DHF.

Level of Knowledge*	Number (n = 422)	Percent
Low	194	46.0
Moderate	217	51.4
High	11	2.6

*Bloom's classification. Low mean less than 9 score, Moderate mean 9-11score, High mean more than 11 score.

46 percent of respondents had low level of knowledge, while 51.4 percent had a moderate level (Table 4.3).

4.3 Perception toward DHF

The DHF perception part comprised four aspects of DHF susceptibility, severity, benefits and barriers to DHF prevention. There were 23 statements in the DHF perception part. The score for each positive statement was 5,4,3,2 and 1 corresponding to "strongly agree", "agree", "undecided", "disagree" and "strongly disagree", respectively. The score was reversed for negative statements. The total score for each part of DHF perception scores was categorized into two groups: 'high perception' (equal to or more than 50^{th} percentile) and 'low perception' (less than 50^{th} percentile).

Table 4.4 Percentage of Respondents Related to Perception toward Susceptibility of DHF by items.

Statements	**SA**	**A**	**U**	**D**	**SD**
1. DHF can be infected to others if used same container with the patient.	0	25.1	17.5	30.3	27.0
2. Everyone has the opportunity to be infected DHF.	34.8	53.1	4.7	6.2	1.2
3. Children usually are more vulnerable infected DHF than adult.	28.4	52.6	7.3	9.2	2.4
4. People who live in community that has DHF have an opportunity to contract DHF more than the normal population.	27.0	53.8	11.6	5.9	1.7
5. Daytime sleeping in mosquito net can prevent DHF.	21.1	49.1	15.4	12.8	1.7
6. Having breeding sites in the household area will increase the opportunity of contracting DHF.	50.0	46.0	2.1	1.7	0.2

(SA = strongly agree**, A** = Agree, **U** = Undecided, **D** = Disagree, **SD** = strongly disagree)

Table 4.4 shows that breeding sites in household will increase the opportunity of DHF as strongly agree and agree about 50 and 46 percent, respectively. Using a container with a DHF patient may because infection was misunderstood by about 25.1 percent.

Table 4.5 Level of Perception toward Susceptibility of DHF

Level of Perception toward susceptibility of DHF*	Number	Percentage
High of perception	166	39.3
Low of perception	256	60.7

*at 50 th percentile and above

Perception of DHF susceptibility in this study was mostly at a low level about 60.7% at the 50th percentile level and above.

Table 4.6 Percentage of Respondents Related to Perception toward Severity of DHF by Items.

Statements	SA	A	U	D	SD
7. DHF in children create a greater opportunity for mortality than in adults.	37.4	49.3	7.1	4.7	1.4
8. DHF has impact on family expenses.	20.4	54.5	11.8	10.2	3.1
9. DHF is a treatable disease.	33.6	56.6	6.6	2.6	0.5
10. Secondary infection of dengue has more severity than the first infection.	14.9	40.5	35.8	7.6	1.2
11. Inappropriate treatment of DHF may cause complications.	31.8	60.7	5.7	1.4	0.5

(SA = strongly agree**, A** = Agree, **U** = Undecided, **D** = Disagree, **SD** = strongly disagree)

Table 4.6 shows that perception toward DHF severity of respondents in the strongly agree and agree categories about treatable disease of DHF (33.6%, 56.6%) and complication from inappropriate treatment (31.8%, 60.7%).While secondary infection has more severity than primary infection as strongly agree and agree was about 14.9 percent and 40.5 percent, respectively.

Table 4.7 Level of Perception toward DHF Severity.

Level Perception of DHF Severity *	Number	Percentage
High	165	39.1
Low	257	60.9

* at 50 th percentile and above

High level of perception of DHF severity was cut off more than or equal to the 50th percentile about 39.1 percent. Most of respondents do not pay attention to the severity of the disease.

Table 4.8 Percentage of Respondents Related to Beneficial Perception of DHF Prevention by items.

Statements	SA	A	U	D	SD
12. Eradicating the breeding sites of mosquitoes can reduce the number of patients.	53.6	43.6	1.4	0.5	0.9
13. Mosquito-repellent use can reduce DHF patients.	21.6	58.5	14.7	4.7	0.5
14. Daytime sleeping in mosquito net can reduce DHF patients.	21.6	58.5	14.7	4.7	0.5
15. Prevention of DHF can reduce the burden of the family.	29.1	61.8	6.9	0.9	1.2

(SA = Strongly agree**, A** = Agree, **U** = Undecided, **D** = Disagree, **SD** = Strongly disagree)

Table 4.8 show that eradication of breeding sites can reduce number of patients in strongly agree and agree categories at about 53.6 percent and 43.6 percent, respectively.

Table 4.9 Level of Perception toward to Beneficial of DHF Prevention.

Level Perception of beneficial of DHF prevention*	Number	Percentage
High	167	39.6
Low	255	60.4

*at 50 th percentile and above

Perception of beneficial prevention of DHF was mostly a low level about at 60.4 percent which is lower than 50 th percentile level.

Table 4.10 Percentage of Respondents Related to Perception towards the Barrier of Prevention of DHF by items.

Statements	SA	A	U	D	SD
16. Prevention and control DHF is difficult due to difficult mosquito control.	15.9	44.3	8.3	24.4	7.1
17. Daytime sleeping in mosquito nets is not convenient to do for disease prevention.	4.3	31.5	14.2	41.9	8.1
18. Wearing long sleeve clothes and long pants is inconvenient to practice to prevent DHF.	3.1	33.4	17.1	41.2	5.2
19. Scrubbing and changing the water of household containers every week is difficult to do.	3.6	14.5	5.7	61.4	14.9
20 . Scrubbing and changing water of household containers every week can cost money and lost time.	1.7	13.7	6.4	60.2	18.0
21. Chemical fogging has a foul smell and is a danger to health.	11.6	37.4	17.5	26.8	6.6
22. Eradication of breeding sites of mosquito in the household area is difficult to do.	1.4	13.5	6.2	60.2	18.7

(SA = strongly agree, A = Agree, U = Undecided, D = Disagree, SD = Strongly disagree)

All questions in table 4.10 were negative questions. For the highest strongly disagree and disagree found were in the eradication of breeding sites of mosquitoes in the household area is difficult category about 18.7 percent and 60.2 percent, respectively. Questions about DHF prevention and control is difficult due to difficulty in mosquitoes control was found to be at strongly agree and agree at about 15.9 percent and 44.3 percent, respectively.

Table 4.11 Level of Perception towards the Barrier of DHF prevention

Level Perception of barrier in DHF*	Number	Percentage
High	**218**	**51.7**
Low	204	48.3

*at 50 th percentile and above

Perception of the barrier of DHF prevention was mostly at a high level about 51.7 percent at equal to or more than the 50th percentile level.

4.4 Cue to action to DHF prevention

The cues to action for good preventive behavior contained one question for each aspect about family experience of DHF: receiving information from health care personnel, receiving information from mass media and the availability of temephos in the household. For each statement, one point was given for a 'yes' answer and zero for 'no'.

Table 4.12 Number and Percentage of Respondents Related to Cue to action to prevent DHF

Factor Impact	Number (n = 422)	Yes %
1. Family experience about DHF can induce DHF preventive behavior.	331	78.4
2. Receiving information from health care personnel can induce DHF preventive behavior.	390	92.4
3. Receiving information from various mass media can induce DHF preventive behavior.	392	92.9
4. Availability of chemical temephos in households can induce DHF preventive behavior.	362	85.8

Table 4.12 shows that receiving DHF preventive information from health care personnel and mass media that induce DHF preventive behavior at about 92.4 percent and 92.9 percent, respectively. While 78.4 percent is from family experience in DHF that induces preventive behavior. Availability of chemical temephos in household can induce preventive behavior was about 85.8 percent.

4.5 DHF preventive behaviors

The preventive behavior part regarding DHF comprised nine questions which covered vector eradication, vector control and self-protection. Scores for each statement were 4,3,2,1 and 0 corresponding to 'always', 'quite often', 'sometimes', 'rarely', and 'none'. The total score for DHF preventive behavior was categorized into two groups: 'good' (equal to or more than 75th percentile) and 'poor' (less than 75th percentile).

Table 4.13 Percentage of Respondents Related to DHF Preventive Behaviors by Items

Preventive Behaviors in DHF	Always	QO	S	Rarely	None
1. Cover water container	55.5	17.5	21.1	3.8	2.1
2. Change the water of uncovered container every week	41.5	21.6	24.2	8.8	4.0
3. Clean and scrub water containers every week	36.3	21.6	29.1	10.7	2.4
4. Put fish in uncover container or outdoor container	36.5	9.7	16.8	4.7	32.2
5. Put the larvicide for treating water, temephos in uncover container	41.2	18.2	26.8	9.5	4.3
6. Get rid of used containers every week	44.8	19.7	22.5	10.0	3.1
7. Daytime sleeping in nets.	19.2	10.4	26.8	10.9	32.7
8. Repellant use while outdoor	8.5	9.0	35.5	13.5	33.4
9. Wearing long sleeves in order to prevent mosquito bites.	6.9	9.7	34.8	19.0	29.6

(None ; Rarely; S = Sometime ; QO = Quite often; Always)

Cover water container was the most chosen DHF preventive behaviors of respondents which were always and quite often done at about 55.5 percent and 17.5 percent, respectively. While least popular DHF preventive behaviors was wearing long

sleeves to prevent mosquito bites at always and quite often done at about 6.9 percent and 9.7 percent, respectively.

Table 4.14 Level of DHF Preventive Behaviors.

Level of DHF preventive behaviors*	Number	Percentage
Good behavior	105	24.9
Poor behavior	317	75.1

*at 75th percentile and above

DHF preventive behaviors in this study was classified at 75th percentile and above which meant good preventive behaviors at about 24.9 percent.

4.6 Association between study factors and DHF preventive behaviors.

Chi-square tests were used to detect associations between each independent variable and preventive behavior. Multiple logistic regression was used to determine factors significantly associated with DHF preventive behavior. Results show in Table 4.15 – Table 4.20.

Table 4.15 The Association between DHF Preventive Behaviors and Socio - demographic Factors

Socio-demographic factors	**n** (n=422)	**DHF Preventive Behavior**		**Crude OR (95% CI)**	**P-value**
		Good %	**Poor %**		
Age group					0.476
< 25	67	20.9	79.1	1	
25 - 35	77	27.3	72.7	1.42(0.66-3.08)	0.375
36 - 45	77	23.4	76.6	1.16(0.52-2.55)	0.721
46 - 55	68	19.1	80.9	0.89(0.39-2.08)	0.796
> 55	133	29.3	70.7	1.57(0.78-3.15)	0.204
Age level					0.537
≤ 45	220	23.6	76.4	1	
> 45	202	26.2	73.8	1.15 (0.74-1.79)	0.537

Table 4.15 The Association between DHF Preventive Behaviors and Socio - demographic Factors (cont.)

Socio-demographic factors	n (n=422)	DHF Preventive Behavior		Crude OR (95% CI)	P-value
		Good %	Poor %		
Marital status					0.364
Single	142	22.5	77.5	1	
Married	200	28.0	72.0	1.34(0.81-2.21)	0.255
Divorced/ Widow/ Separated	80	21.3	78.8	0.93(0.48-1.80)	0.825
Gender					0.751
Male	93	26.9	73.1	1	
Female	329	24.3	75.7	0.87 (0.52-1.47)	0.613
Level of education					0.482
No education	12	8.3	91.7	1	
Less Bachelor	317	25.2	74.8	3.71(0.47-29.21)	0.213
Bachelor	91	25.3	74.7	3.72(0.46-30.41)	0.220
Above Bachelor	2	50.0	50.0	11(0.35-345.06)	0.173
Education level					0.815
Less Bachelor	329	24.6	78.4	1	
Bachelor and above	93	25.8	74.2	1.06(0.62-1.81)	0.815
Family pattern					0.248
Nuclear Family	282	26.6	73.4	1	
Extended Family	140	21.4	78.6	0.75(0.46-1.21)	0.249
Occupation					0.286
Employee	128	24.2	75.8	1	
Civil servant	52	34.6	65.4	1.66(0.82-3.34)	0.157
Business	108	23.1	76.9	0.94(0.52-1.72)	0.847
None	67	17.9	82.1	0.68(0.32-1.44)	0.315
Housewives	67	28.4	71.6	1.24(0.64-2.42)	0.53

Table 4.15 The Association between DHF Preventive Behaviors and Socio - demographic Factors (cont.)

Socio- demographic factors	n (n=422)	DHF Preventive Behavior		Crude OR (95% CI)	P-value
		Good %	Poor %		
Family income(Baht)					0.941
Less than 10,000	287	25.1	74.9	1	
10,000-20,000	105	23.8	76.2	0.93(0.55-1.57)	0.795
More than 20,000	30	26.7	73.3	1.09(0.46-2.55)	0.850
Duration of stay (Year)					0.908
≤ 25	227	25.1	74.9	1	
26 -50	150	25.3	74.7	1.01(0.63-1.63)	0.961
> 51	45	22.2	77.8	0.85(0.39-1.83)	0.681
Religion					0.699
Buddhist	409	24.7	75.3	1	
Islam	11	27.3	72.7	1.14(0.29-4.39)	0.845
Christian	2	50	50	3.05(1.9-49.19)	0.432

Although all socio-demographic factors in this study were not associated to DHF preventive behavior, but higher age group, married group, higher education level group, higher income group, long duration of stay group and non-Buddhist group tended to have good DHF preventive behaviors. (Table 4.15)

Table 4.16 The Association between DHF Preventive Behaviors and Knowledge Factors

Knowledge factors	n (422)	DHF Preventive Behaviors		Crude OR (95% CI)	P-value
		Good %	Poor %		
Level of Knowledge *					0.245
Low	194	23.2	76.8	1	
Moderate	217	25.3	74.7	1.12(0.72-1.77)	0.612
High	11	45.5	54.5	2.76(0.80-9.45)	0.107

*Bloom's classification

From table 4.16 shows that no association between DHF preventive behaviors and knowledge factors. But moderate and high level of knowledge tends to have good preventive behaviors more than the low level group about 1.12 times and 2.76 times, respectively despite no statistical significance.

Table 4.17 The Association between DHF Preventive Behaviors and Knowledge Factors

Knowledge factors	n (422)	DHF Preventive Behavior		Crude OR (95% CI)	P-value
		Good %	Poor %		
Knowledge *					
Poor	296	22.6	77.4	1	
Good	126	30.2	69.8	1.47(0.92-2.35)	0.102

* Good knowledge was classified at percentile 50th and above

The good knowledge group about 29.9 percent of respondents tends to have good preventive behaviors more than the poor knowledge group 1.47 times despite not being statistical significant.

Table 4.18 The Association between DHF Preventive Behaviors of Respondents and Perception Factors.

Perception factors**	n (n=422)	DHF Preventive Behaviors		Crude OR (95% CI)	P-value
		Good %	Poor %		
Susceptibility					0.30
Low	256	23.0	77.0	1	
High	166	27.7	72.3	1.28(0.82-2.00)	0.280
Severity					0.254
Low	257	23.0	77.0	1	
High	165	27.9	72.1	1.29(0.89-2.03)	0.254
Beneficial in DHF Prevention					0.030
Low	255	21.2	78.8	1	
High	167	30.5	69.5	1.64(1.05-2.56)	**0.030***
Barrier of DHF Prevention					**0.028***
Low	204	20.1	79.9	1	
High	218	29.4	70.6	1.65(1.05-2.56)	**0.029***

*p < .05

The association between DHF preventive behaviors and DHF perception are shown in Table 4.18. And shows that significantly association between DHF preventive behaviors and DHF perception in beneficial prevention and barrier of prevention (p-value < 0.05). People with high level of DHF perception tend to have better preventive behaviors.

Table 4.19 The Association between Cue to action and Preventive Behaviors in DHF

Cue to action	n (n=422)	DHF Preventive Behaviors		Crude OR (95% CI)	P-value
		Good %	Poor %		
Family Experience in DHF					**0.922**
Yes	331	24.8	75.2	0.97(0.57-1.66)	0.922
No	91	25.3	74.7	1	
Health care information					0.208
Yes	390	25.6	74.4	1.86(0.69-4.97)	0.214
No	32	15.6	84.4	1	
Media information					0.839
Yes	392	25.0	75.0	1.09(0.46-2.63)	0.839
No	30	23.3	76.7	1	
Available Temephos					0.011*
Yes	362	27.1	72.9	2.81(1.24-6.39)	**0.014***
No	60	11.7	88.3	1	

*p < .05

Association between DHF preventive behaviors and cue to action, concerning availability of the larvicide for treating water, temephos in household was significantly associated. Receiving DHF preventive information from healthcare personnel, receiving information from mass media and family experience of DHF were not significantly associated to preventive behavior shown in Table 4.19.

Table 4.20 Adjusted ODDs ratios for DHF Preventive Behaviors.

Variables	Adj. OR	95% C.I.		P-value
		Lower	Upper	
Age group (years)				
≤ 45	1			
> 45	1.09	0.69	1.72	0.709
Education Level				
Lower than bachelor	1			
Bachelor and above	0.94	0.54	1.63	0.828
Knowledge of DHF*				
Poor	1			
Good	1.32	0.79	2.20	0.281
Perception of Susceptibility**				
Low	1			
High	0.95	0.58	1.65	0.986
Perception of Severity**				
Low	1			
High	1.15	0.69	1.91	0.579

Table 4.20 Adjusted ODDs ratios for DHF Preventive behaviors (cont.)

Variables	Adj. OR	95% C.I.		P-value
		Lower	Upper	
Perception of Beneficial in Prevention**				
Low	1			
High	1.15	0.97	2.56	0.064
Perception of barrier in Prevention**				
Low	1			
High	1.15	0.97	2.56	0.064
Cue to action				
Family experience in DHF.				
Yes	0.95	0.52	1.72	0.877
No	1			
Health care information				
Yes	2.00	0.57	7.06	0.278
No	1			
Media information				
Yes	0.42	0.13	1.37	0.155
No	1			
Available Temephos				
Yes	2.89	1.22	6.86	**0.016***
No	1			

*p- value < 0.05 ; ** cut point 50 th and above

Table 4.20 shows that after adjusting for other factors in the model by multiple logistic regression test, the significantly associated factor of DHF preventive behaviors consisted of only available chemical temephos in household. After

adjusting for other factors, people who had temephos in household was nearly three times more likely to have good preventive behavior than those who did not (Adj OR = 2.89, 95% CI = 1.22-6.86).

CHAPTER V
DISCUSSION

This was a cross-sectional study in order to find out associations between the factors that are related to DHF preventive behaviors of adult who lived in Phra Nakhon Si Ayutthaya Municipality, Phra Nakhon Si Ayutthaya Province, Thailand. In this chapter, we discuss the important findings of the study as follows.

5.1 Methodology of the study.

5.2 DHF preventive behaviors of the respondents.

5.3 The association between DHF preventive behaviors of the respondents and socio-demographic factors.

5.4 The association between DHF preventive behaviors of the respondents and knowledge factors.

5.5 The association between DHF preventive behaviors of the respondents and perception factors in DHF susceptibility, DHF severity, benefit in DHF prevention and barrier in DHF prevention.

5.6 The association between DHF preventive behaviors of the respondents and cue to action factors to DHF preventive behavior, such as family experience in DHF, information from health care personnel, information from mass media and available temephos in household.

5.1 Methodology of the study

5.1.1 Ethical approval was obtained from the ethical committee of Phra Nakhon Si Ayutthaya Hospital. This research was a cross-sectional survey to find out DHF preventive behaviors and associated factors of DHF preventive behaviors of people who lived in Phra Nakhon Si Ayutthaya Municipality, Pra Nakhon Si Ayutthaya Province, Thailand. We performed a study to understand association of independent variable factors like socio-demographic factor (age, gender, marital status, education, occupation, income, duration of stay, religion and family pattern), knowledge factor, perception factor (DHF susceptibility, DHF severity, benefit in DHF prevention and barrier in DHF prevention) and cue to action to DHF preventive behavior of people who lived in Phra Nakhon Si Ayutthaya Municipality, Phra Nakhon Si Ayutthaya Province, Thailand. DHF has been studied many times and from many aspects. However, there have been very few studies done in this area. The author would like to understand more about DHF preventive behaviors and find out which factors were related to preventive behaviors in DHF. We used data obtained in July 2014. This was an appropriate period for this study because it was right before the rainy season and a pre-epidemic period for DHF. Although many interventions have been applied to prevent and control DHF, this disease still has high incidence.

5.1.2 Sample size: Amphur Phra Nakhon Si Ayutthaya was selected for this study because of its highest incidence of DHF in Phra Nakhon Si Ayutthaya Province in the past. Phra Nakhon Si Ayutthaya Municipality has higher incidence of DHF than any other area in Amphur Phra Nakhon Si Ayutthaya. An average sample size was 384. Ten percent was added to 384 participants in case of missing or incomplete data which was approximately 422 respondents.

5.1.3 Research instruments. Questionnaires were made by reviewing the study of related literatures and previous study about DHF. Questionnaires were corrected by 2 advisors and 3 panels of experts consisting of one pediatrician, one pediatric nurse and one family nurse from Phra Nakhon Si Ayutthaya Hospital. Questionnaires were structured into 5 parts – socio-demographic part, knowledge part, part of perception (DHF susceptibility, DHF severity, benefit in DHF prevention and barrier in DHF prevention), part of cue to action and DHF preventive behavior part. The questionnaires were handed to 30 adult's age 18 years old in Phra Nakhon Si

Ayutthaya Municipality. The Kuder-Richardson (KR20) test for knowledge part was 0.72. The Cronbach's α coefficient for the perception part was 0.58. There was a possibility that respondents may misunderstand the questionnaires due to the fact that they were self- administrated. For example, a "mosquito net" in this study could mean both a mosquito net and a mosquito screen. Respondents may misinterpret it to mean only a mosquito net, not a screen especially in a negative question, e.g. difficulty to sleep in daytime in a mosquito net.

5.1.4 Sample technique. Phra Nakhon Si Ayutthaya Municipality has 410 health care volunteers that take care 3,848 households and 49,204 of the population whose ages were above 18 years old. Ten percent of target population was 492 people. 492 self-administered questionnaires were distributed to eligible people in July 2014 by healthcare volunteers. The author accompanied by a public health officer from Phra Nakhon Si Ayutthaya Municipality had explained the objective of the study and how to answer questionnaires to health care volunteers in order to explain people later. Out of 492 questionnaires, 422 questionnaires were completed and returned with response rate 85.8%. The respondents in this study were randomly selected by health care volunteers. Bias may occur if a health care volunteer was familiar with the respondent. The author randomly distributed questionnaires in order to reduce bias in the study.

5.1.5 Statistical Analysis: Socio-demographic data was analyzed using descriptive analysis by number, percentage, mean, standard deviation. Part of knowledge used numbers and percentages. Classification in level of knowledge by Bloom's classification in low, moderate and high level by less than 60%, 60-80% and more than 80% respectively. The other 3 parts were analyzed in numbers and percentages. All independent variables were classified to 2 levels at equal and more than 50^{th} percentile as good or high. Chi-square tests were used to determine an association between each independent variable and DHF preventive behaviors. Good DHF preventive behavior was classified at greater than or equal 75^{th} percentile. Multiple logistic regression was used to determine significant factors associated with DHF preventive behavior.

5.2 DHF preventive behaviors of the respondents

DHF preventive behaviors in this study were asked in questionnaires like public DHF health campaign. 75th percentile or above is classified as good DHF preventive behavior (105 respondents). Covered water container in this study was done in a high percentage in DHF preventive behavior in regular and nearly regular about 55.5 percent and 17.5 percent. Self-preventive behaviors such as daytime sleeping in a mosquito net, using repellent when outside, or wearing long sleeve when outside, were not done about nearly one-third (32.7%, 33.4%, 29.6%). Self-protection like wearing long sleeves when outside may not be a practical preventive behavior because of the warm weather. Daytime sleeping in a mosquito net may be misinterpreted because of mosquito wire screen is normally used in household instead nowadays. Respondents may not be familiar with mosquito repellent because of its viscous feelings. Result of prevention was different from other studies. Itrat et al (55) conducted a study using 447 visitors in tertiary hospital in Pakistan. They found that use of anti-mosquito spray was the most prevalent (48.1%) preventive measure. Dengue knowledge in preventive measures was found mostly prevention of mosquito bites (78.3%) rather than eradication of mosquito population (17.3%). Because of higher prevalence of malaria causing Anopheles mosquito in Pakistan than Dengue causing Aedes mosquito, the methods of preventing of mosquito bite was found rather than methods to eradicating it.

This result was different to other study like Teetipsatit S (54) who conducted family leader in Ban Chang-lo, Bankok-Noi, Bangkok. The author of that study found that preventive behavior in moderate and high about 65 percent and 14.7 percent respectively. Because of family leaders had responsibility to take care all people in family that mostly had higher preventive behavior than other. In this study respondents may be a family leader or a family member with different responsibility to his/her family. Sakai et al (49) conducted study in migrants in Samut Sakhon. They found that preventive behavior in moderate level and high level about 43.18 and 42.61 percent, respectively despite poor knowledge in 71.02 percent but high perception toward DHF at 64.77 percent. Bunsuan P (72) conducted a study of mothers on DHF in Petchabun. He province found that overall preventive behaviors on DHF at fairly good level

(M=2.3, SD=0.5). Higher preventive behavior in other studies may be more responsibility to family of respondents than this study.

5.3 The association between DHF preventive behaviors of the respondents and socio-demographic factors.

None of the socio-demographic variables in this study were significant. Result of this study was similar to the study of Teetipsatit S (54) who found that age, sex, education, occupation and family income had no association with DHF preventive behaviors. Only religion in socio-demographic factor had significantly associated in that study. Most respondents (77.96%) in this study did not have a Bachelor's degree.

Van Benthem et al (47) conducted study in three areas in northern of Thailand in 2001, found that knowledge of dengue significantly differed by age, sex, occupation. Younger age (15-29 years old) had more knowledge about dengue than old age (more than 60 years old). Age and education level were found to be related to preventive behavior in DHF of people in Muang Suphan Buri Municipality as discussed in the study by Putkhuntod R ST (48). Extended family in this study may be low socioeconomic that was not interested in DHF prevention. Wong et al (46) found that old age and young students had low perception in susceptibility of disease.

Married status was found a higher percentage in good DHF preventive behaviors than single status and separated status about 28, 22.5 and 21.3 percent, respectively.

Although no association between family pattern and DHF preventive behaviors in this study, nuclear family was found to have good preventive behaviors of 17.8 percent compared to 7.1 percent from extended family.

Adequate income of family was related to preventive behaviors in family in DHF in Muang Suphan Buri Municipality that conducted study by Putkhuntod R ST (48). Concerning to gender, high percentage of female had high level of DHF preventive behaviors rather than male about 19 percent and 5.9 percent, respectively.

Sex was found no correlation to DHF preventive behaviors like study of Teetipsatit S (54).

Married status was found higher percentage in DHF preventive behaviors than separated status and single status about 13.3, 4 and 7.6 percent, respectively.

Education level was not correlated to DHF preventive behaviors like Teetipsatit S (54). In this study education level majority (75%) were less than Bachelor's degree.

Family pattern: Although no association between family pattern and DHF preventive behaviors in this study, nuclear family found good preventive behaviors in 17.8 percent compare with extended family in 7.1 percent.

Occupation and income: Adequate income of family was related to preventive behaviors in family in dengue hemorrhagic fever in Muang Suphan Buri Municipality that conducted study by Putkhuntod R ST (48). Huff RK (50) found that income was associated with wealth and health care condition. Teetipsatit S (54) conducted a study on middle class of family leaders. He found no association to preventive behaviors like this study. In this study, mostly respondents (68%) earned less than 10,000 baht per month, where as 30.3% of respondents was an employee. Respondents in this study were in low to middle class that may not pay attention to preventing diseases. Duration of stay were found to be significantly associated to DHF preventive behaviors of migrant in Samut Sakhon of Masayo Sakai's study (49). Migrants in Samut Sakhon were not familiar with the environment in Thailand. Longer stay tends to increase preventive behaviors. Duration of stay of respondents in this study was not associated with DHF preventive behaviors despite long duration of stay at least 10 years.

Religion: Teetipsatit S (54) conducted a study on family leaders in Ban Chang-Lo, Bangkok. He found that religion was significantly correlated with DHF preventive behavior. In his study, Buddhism, Muslim and others were 98.5, 1, and 0.5 percent compared to 96.9, 2.61 and 0.47 percent in this study. But we found that there was no association between religion and DHF preventive behaviors.

5.4 The association between DHF preventive behaviors of the respondents and knowledge factors.

Concerning knowledge of respondents in this study, we found that moderate level about 60-80 percent. This study found that low level in knowledge had high percentage in good DHF preventive behaviors in 25.6 percent while moderate and high level of knowledge had 13 percent and 1.2 percent in good DHF preventive behaviors, respectively. The reason that low level in knowledge was usually associated with low income is that their houses might not have well-maintain infrastructure like there was no screen on the window, water-reservoir. They might need to take care themselves away from DHF by increase preventive behavior like using mosquito net and covering water containers, instead. In this study DHF preventive behaviors of the respondents and knowledge factors was not significantly associated as shown in Teetipsatit S (54).However other study like Van Benthem et al (47) found that the more knowledge in DHF, the more preventive behavior than no knowledge group. Van Benthem et al (47) conducted a study in three areas in northern of Thailand in 2001, and found that knowledge of dengue significantly differed by age, sex, occupation. Younger age group (15-29 years old) had more knowledge about dengue than old age group (more than 60 years old).

Considering each item of the knowledge in this study, the author found that respondents had very good knowledge (more than 90%) in the following items regarding causes of DHF, carrier of dengue virus and breeding sites being the top three corrected answers. Regarding biting activity of Aedes agypti in daytime, river is not a breeding site was a correct answer 80%-90%. Representatives with basic knowledge about cause of DHF, breeding site of Aedes agypti and biting activity were in high level. Symptom and sign of DHF in general and critical period were correct answers less than 80%. Headache is a symptom that does not require an emergency to the hospital was a correct answer only 20.9%. While initial treatment with oral fluid and fever reducing was a corrected answer less than 30%. Reason may be those questions that associated with medical were difficult to understand for inexperience people or not health care personnel.

The public health officer usually emphasized in causes of disease and how to get rid of mosquito, while treatment may be not interesting to people. Larva stage is

the best stage to eradicate mosquitos that was a correct answer 48.6%. While simple treatment about oral fluid therapy and fever reducing may be not emphasized to the people by the public health officer or not interesting for inexperience people. For strategy to get rid of mosquitos should emphasize in larva stage. Many people believed that foggy are a better way to get rid of mosquitos. Nowadays DHF spread in every season because of global warming was a correct answer only 18%.

For knowledge that should be emphasized to people that all season spreading, symptoms and sign especially warning signs in critical period , best stage of larva for elimination and initial treatment. Breeding sites was a correct answer most in water jar, not in river should be emphasized in order to eradicate mosquitos.

5.5 The association between DHF preventive behaviors of the respondents and perception factors in DHF susceptibility, DHF severity, benefits of DHF prevention and barrier in DHF prevention.

Level of perception toward susceptibility in DHF was mostly in low level that less than 50th percentile about 60.7%. When concern to strongly agreed and agreed answers that more than 80% were found in opportunity to infection in everyone, children more at risk infection than adult, living with DHF in community more at risk than other and breeding sites in household more at risk infection than other.

While daytime sleeping in mosquito net were agreed and strongly agreed about 70.2%. Using common container of patient could not be infected DHF about 57.3 percent (SD 27%, D 30.3%). This result was closed to result of Winch et al (73) about 38.6%. Sakai et al (49) found that sharing containers with patients will not get disease.

The survey of Huu TN (74) in housewives in Vietnam, found that correlation between perception and preventive behaviors.

Level of perception toward severity in DHF was mostly in low level that less than 50 percentile about 60.9 percent. When concern to strongly agreed and agreed answers that more than 80% were found in severity to death more common in children than adult, treatable disease of DHF and complication from improper

treatment. While family expense impact were agreed and strongly agreed about 74.9%. More Severity in secondary infection than first time was 55.4% (agreed and strongly agreed).

Level of perception toward benefits of preventing DHF was mostly in low level that less than 50th percentile about 60.4 percent. When concern to strongly agreed and agreed answers that more than 80% were found in all questions like eradication in breeding sites, mosquito net and mosquito repellent in preventive method to reduce patient and reduced burden of family by prevention. Although in this study level of perception toward the benefits prevention in DHF mostly in low level, but association between beneficial perception of disease and preventive behavior in DHF were found significantly association ($p = 0.04$). High perception in benefits of DHF preventive behavior had 1.64 times to low perception in benefits of prevention to have good DHF preventive behavior.

Level of perception toward barrier in prevention of DHF was mostly in high level that more than 50th percentile or above that about 51.7 percent. Perception in barrier in DHF prevention and DHF preventive behavior in this study was significantly associated. (p value = 0.03) Different result of Sakai et al (49) in perception in barriers of DHF prevention were not associated to DHF preventive behaviors. Because of low knowledge level in migrants, costly of preventive chemical spray and foul smell chemical spray that be barriers to preventive behavior.

5.6 The association between DHF preventive behaviors of the respondents and cue to action factors to DHF preventive behaviors, like family experience of DHF, receiving health information from health care personnel, mass media and available the larvicide which treating water, temephos in household. Teetipsatit S (54) and Sawaddiwudhipong et al (58) reported that audiovisual media was effective media and common source to receive information in the year 1992. But nowadays in high technology that audiovisual like in the past may be not effective in present. Results of cue to action in this study about receiving health information from mass media and health care personal to DHF preventive behavior were not significantly associated nowadays. But receiving health care information

from health care personnel and mass media still necessary to do because of increase good DHF preventive behavior more than one time if did not received. New strategy to provide health information may be adapted to different from the past, like social media. Experience of DHF in the family make respondents might concerned about DHF prevention that corresponds to the study of Sakai et al (49) and Kittikul L SK (62). But in this study experience of DHF in their family was not correlated to DHF preventive behavior. Because of morbidity and mortality in this disease have decease nowadays.

Available the larvicide which treating water, temephos in household had significantly association with DHF preventive behaviors. (p value = 0.016) Result of this study corresponded to Teetipsatit S (54) that adequate resources for preventive behavior on DHF had significantly associated on the risk on DHF preventive behaviors of family leader.

CHAPTER VI
CONCLUSIONS AND RECOMMENDATIONS

Dengue hemorrhagic fever (DHF) is still one of the major problems of public health in the South-East Asia (1), especially in Thailand. Despite long time controlling in DHF, Phra Nakhon Si Ayutthaya Province still has a high incidence of DHF (10). The objective of this study is to identify preventive behaviors in DHF and factors related to DHF preventive behaviors. A cross sectional study was performed in people aged 18 years or older who lived in Phra Nakhon Si Ayutthaya Municipality, Phra Nakhon Si Ayutthaya Province, Thailand. 492 self-administered questionnaires were distributed to eligible people in July 2014. The response rate from the questionnaires was around 85% (422 respondents). Chi-square tests and multiple logistic regressions were used to examine factors related to DHF preventive behaviors. The finding of this study can be concluded:

6.1 Conclusion

6.1.1 DHF preventive behaviors

6.1.2 Socio-economic factors

6.1.3 Knowledge factors

6.1.4 Perception factors in susceptibility, severity, beneficial in DHF prevention and barrier in prevention of DHF.

6.1.5 Cue to action in DHF preventive behavior

6.1.6 The Chi-square test showed that association between DHF preventive behavior and each of all independent factors.

6.1.7 Multiple Logistic regressions showed that conclude the predicting factors of DHF preventive behavior.

Good DHF preventive behavior was classified at 75th percentile or above (69). Nearly 25% of respondents were classified into good DHF preventive behavior group. Although all socio-demographic factors (age, gender, marital status, education level, occupation, income, duration of stay, family pattern and religion) in this study were not significantly associated to DHF preventive behavior, but higher age group, married group, higher educational level group, higher income group, long duration of stay group and non-Buddhist group tended to have good DHF preventive behavior. This was also the case for knowledge level, perception of DHF susceptibility, perception of DHF severity, family experience of DHF, and information received from health care personnel and mass media that were not significant. Good knowledge group of respondents tends to have good preventive behavior more than poor knowledge group 1.47 times despite not statistical significance. Good DHF perception in four aspects (susceptibility, severity, benefit of prevention, barrier in prevention) tends to have higher DHF preventive behavior than poor perception groups. Perception in beneficial prevention and barrier in DHF prevention were significantly associated to DHF preventive behavior. Association between DHF preventive behavior and cue to action, that availability of the lavicide for treating water, temephos in household was significantly associated. Although receiving DHF preventive information from health care personnel and mass media were not significantly associated to preventive behavior that differenced from Teetipsatit S's study (54), but it's necessary to continuously do. Family experience in DHF was not significantly associated to DHF preventive behavior, too. Chi-square tests revealed that variables associated with preventive behavior were perceived benefits and perceived barriers from preventive behavior, and availability of temephos – the larvicide for treating water – in the households. After adjusting for other factors, people who had temephos in the households scored higher in good preventive behavior (Adj OR = 2.89, 95% CI = 1.22-6.86).

6.2 Recommendations

6.2.1 Recommend for implementation

Health care personnel should continue to distribute knowledge and increase awareness of people in various ways and lead them to adapt to the current situations. Warning signs of DHF and initial management should be added to DHF knowledge. Family experience in DHF influences preventive behaviors as mentioned in Kittikul et al (62) which differs from the present study. People who live in the municipality believe that the controlling vector is the duty of government. An experimental study about effective community based approach programme by Therawiwat et al (57), found that knowledge, perception, self-efficacy and larval survey were higher after the experiment. People with high perception in susceptibility, severity, benefits of prevention, and barriers to prevention were more likely to have good DHF preventive behavior. Knowledge, DHF perception and receiving health information should be promoted in various ways to increase good preventive behavior. Strategies to eliminate breeding sites and increase the availability of temephos in households should be promoted regularly by communities and local administrators. Proper garbage management and recruit the help from the community on eliminating the breeding sites in every season.

6.2.2 Recommend for further studies

The following topics are recommended for further studies:

- Comparative study between high incidence and low incidence of DHF to figure out what leads to low incidence of DHF.
- Factors affecting increase in awareness in preventive behaviors of DHF.
- Due to the nature of self-administered questionnaires, the derived data such as breeding sites, DHF preventive behaviors, and household environment may be lacking. A comparative study between data from self-administered questionnaires and actual observation is suggested.

- How to sustain community’s participation in DHF preventive behaviors.

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APPENDIX

หนังสือแสดงเจตนายินยอมเข้าร่วมงานวิจัย

วันที่……เดือน……พ.ศ. ……

ข้าพเจ้า (นาย /นาง /นางสาว)……

นามสกุล……อายุ……..ปี อยู่บ้านเลขที่…….

หมู่…….....ตำบล…….....อำเภอ.....……จังหวัด…….....

ขอแสดงเจตนายินยอมเข้าร่วมการวิจัย ในโครงการวิจัยเรื่อง พฤติกรรมการป้องกันโรคไข้เลือดออกของประชาชนในเขตเทศบาลนครพระนครศรีอยุธยา จังหวัดพระนครศรีอยุธยา

โดยผู้เข้าร่วมวิจัยได้อ่านเอกสารคำอธิบายแบบสอบถามและ /หรือได้รับฟังคำอธิบายจากอาสาสมัครประจำหมู่บ้าน และได้รับทราบถึงรายละเอียดของการศึกษาวิจัยเกี่ยวกับ วัตถุประสงค์และระยะเวลาที่ทำการวิจัย ขั้นตอนและวิธีการในการตอบแบบสอบถามที่ผู้เข้าร่วมวิจัยต้องปฏิบัติ ผลประโยชน์ที่จะได้รับ และเข้าร่วมการวิจัยด้วยความสมัครใจ โดยมิได้มีการบังคับ หลอกลวงแต่ประการใด และพร้อมจะให้ความร่วมมือในการวิจัย

และผู้เข้าร่วมวิจัยยินยอมให้ผู้วิจัยใช้ข้อมูลส่วนตัว ที่ได้รับจากการวิจัย โดยให้นำเสนอเป็นข้อมูลโดยรวมจากการวิจัยนั้นแต่จะไม่เผยแพร่ ต่อสาธารณะเป็นรายบุคคล ทั้งนี้ผู้เข้าร่วมวิจัยสามารถถอนตัวหรืองดเข้าร่วมการวิจัยได้ทุกเมื่อ โดยจะไม่มีผลกระทบและไม่เสียสิทธิ์ใดๆ ในการรับการบริการและการรักษาพยาบาลที่จะได้รับต่อไปในอนาคต

หากผู้เข้าร่วมวิจัย มีข้อข้องใจเกี่ยวกับขั้นตอนของการวิจัย หรือหากเกิดผลข้างเคียงที่ไม่พึงประสงค์จากการศึกษาวิจัยสามารถติดต่อกับนางสาวดวงพร อัศวราชันย์ ที่อยู่ ค 8 / 11 ถนนอู่ทอง ต. หอรัตนไชย อ. พระนครศรีอยุธยา จ. พระนครศรีอยุธยา เบอร์โทรศัพท์ 035-211888 ต่อ 2540

ผู้เข้าร่วมวิจัยได้อ่านและเข้าใจข้อความตามหนังสือนี้แล้ว จึงได้ลงลายมือชื่อไว้เป็นสำคัญพร้อมกับผู้วิจัย/ ผู้ช่วยวิจัย และพยาน

ลงชื่อ..... ผู้ยินยอมเข้าร่วมการวิจัย

(.....)

ลงชื่อ..... ผู้วิจัย / ผู้ช่วยวิจัย

(.....)

ลงชื่อ..... พยาน

(.....)

แบบสอบถามพฤติกรรมการป้องกันไข้เลือดออกของประชาชน ในเขตเทศบาลนครพระนครศรีอยุธยา จังหวัดพระนครศรีอยุธยา

วันที่ตอบแบบสอบถาม…….....……ชุมชน……..……

<u>ส่วนที่ 1 ข้อมูลส่วนบุคคลทั่วไป</u>

คำชี้แจง โปรดทำเครื่องหมาย / ลงใน หรือเติมข้อความลงในช่องว่างที่ตรงตามความเป็นจริง

1. ท่านมีสถานเพศอะไร 1. ชาย 2. หญิง
2. ปัจจุบันท่านอายุเท่าใด อายุ……..ปี (เกิน 6 เดือน ปัดเศษขึ้นเป็น 1 ปี)
3. ปัจจุบันท่านมีสถานภาพสมรสอะไร

   1. โสด 2. สมรส 3. หม้าย / หย่า / แยกกันอยู่
4. ท่านนับถือศาสนาใด

   1. พุทธ 2. อิสลาม 3. คริสต์ 4. อื่นๆระบุ.....
5. ท่านจบการศึกษาสูงสุดระดับใด

   1. ไม่ได้เรียนหนังสือ 2. ต่ำกว่าปริญญาตรี 3. ปริญญาตรี

   4. สูงกว่าปริญญาตรี 5. อื่น ๆ โปรดระบุ……
6. ปัจจุบันท่านประกอบอาชีพใด

   1.รับจ้างทั่วไป 2.ข้าราชการ 3. เกษตรกร 4. ค้าขาย

   □5.ว่างงาน 6 . พนักงานโรงงาน 7. แม่บ้าน 8.อื่นระบุ …….
7. ท่านมีรายได้เฉลี่ยต่อเดือนเท่าไร ..... บาท
8. ลักษณะครอบครัวของท่านเป็นแบบไหน

   □1. ครอบครัวเดี่ยว □2. ครอบครัวขยาย
9. ท่านอาศัยในครัวเรือนนี้เป็นเวลานานเท่าใด ……ปี

<u>ส่วนที่ 2 ความรู้เกี่ยวกับไข้เลือดออก</u>

คำชี้แจง โปรดทำเครื่องหมาย/ ใน ( ) หน้าข้อที่ท่านคิดว่าถูกที่สุดเพียงข้อเดียว

1. โรคไข้เลือดออกเกิดจากติดเชื้อชนิดใด

   ( ) แบคทีเรีย ( ) ไวรัส ( ) เชื้อรา ( ) พยาธิ
2. ยุงชนิดใดที่ช่วยแพร่กระจายเชื้อไข้เลือดออก หรือเป็นพาหะนำโรค

   ( ) ยุงลาย ( ) ยุงรำคาญ ( ) ยุงก้นปล่อง ( ) ยุงบ้าน

3. ปัจจุบันโรคไข้เลือดออก ระบาดในฤดูใด

( ) ฤดูร้อน ( ) ฤดูฝน ( ) ฤดูหนาว ( ) ทุกฤดู

4. ยุงที่แพร่เชื้อโรคไข้เลือดออกมักออกหากินเวลาใด

( ) กลางวัน ( ) กลางคืน ( ) หัวค่ำ ( ) เช้ามืด

5. ข้อใดเป็นแหล่งเพาะพันธุ์ของยุงที่แพร่เชื้อโรคไข้เลือดออก

( ) แม่น้ำ ( ) คลอง ( ) นาข้าว ( ) โอ่งน้ำในบ้าน

6. ท่านคิดว่าวิธีกำจัดยุงที่ง่ายที่สุดคือช่วงระยะใด

( ) ระยะไข่ ( ) ระยะลูกน้ำ ( ) ระยะตัวโม่ง ( ) ระยะยุงตัวแก่

7. ยุงที่แพร่เชื้อโรคไข้เลือดออก**ไม่**วางไข่ในน้ำแบบใด

( ) น้ำในฐานรองขาตู้กับข้าวหรือแจกันดอกไม้ ( ) น้ำนิ่งใสในภาชนะเก่าๆ

( ) แม่น้ำ ( ) บ่อน้ำขังท้ายบ้าน

8. ข้อใดที่ **ไม่ใช่** อาการแสดงที่ สงสัยว่าบุตรหลานของท่านจะเป็นไข้เลือดออก

( ) ไข้สูง ลอย ( ) มีจุดเลือดออกตามผิวหนัง

( ) หน้าแดง ตัวแดง ( ) ถ่ายเป็นมูก

9. ข้อใด **ไม่ถูกต้อง** เกี่ยวกับการรักษาโรคไข้เลือดออกเบื้องต้น

( ) เช็ดตัวลดไข้ ( ) ให้พาราเซตตามอลเวลาไข้สูง

( ) ให้ยาบรูเฟนหรือแอสไพลินลดไข้สูง ( ) จิบน้ำเกลือแร่บ่อยๆ

10. ระยะอันตรายที่สุดของโรคไข้เลือดออกคือช่วงใด

( ) ช่วงไข้สูง ( ) ช่วงไข้ลงแล้วบ่นปวดท้อง ดื่มน้ำน้อย

( ) ช่วงมีผื่นแดง คัน ( ) ช่วงอะไรก็ได้

11. ข้อใดต่อไปนี้เป็นอาการที่ไม่ต้องรีบไปโรงพยาบาล

( ) ไข้สูง ( ) ปวดเมื่อยตามตัว

( ) ปวดศีรษะ ( ) ไข้ลง กระสับกระส่าย สับสน

12. วิธีใดป้องกันโรคไข้เลือดออกที่ดีที่สุด

( ) ป้องกันไม่ให้ยุงกัด ( ) ไม่กินข้าวร่วมกับคนที่เป็นไข้เลือดออก

( ) ล้างมือก่อนรับประทานอาหาร ( ) ฉีดวัคซีนป้องกันไข้เลือดออก

13. การกำจัดลูกน้ำยุงที่แพร่เชื้อไข้เลือดออกเป็นหน้าที่ของใคร

( ) อสม. ( ) เทศบาล

( ) เจ้าหน้าที่สาธารณสุข ( ) ทุกคนในบ้านและชุมชน

14. ข้อใดเป็นการรักษาโรคไข้เลือดออกระยะเริ่มต้นที่สำคัญที่สุด

( )เช็ดตัวลดไข้ ( ) ดื่มน้ำเกลือแร่บ่อยๆ

( ) เฝ้าระวังสัญญาณอันตราย ( )ให้ยาปฏิชีวนะ

<u>ส่วนที่3 การรับรู้ต่อการติดเชื้อ ความรุนแรง ประโยชน์และอุปสรรคการป้องกันโรค</u>

กรุณาใส่เครื่องหมาย / ในช่องที่ท่านมีความคิดเห็นตรงมากที่สุด

เนื้อหา	เห็นด้วยอย่างยิ่ง	เห็นด้วย	ไม่แน่ใจ	ไม่เห็นด้วย	ไม่เห็นด้วยอย่างยิ่ง
<u>การรับรู้โอกาสเสี่ยงต่อการเกิดโรคไข้เลือดออก</u> 15. การกินน้ำหรือ ใช้ภาชนะร่วมกันกับผู้ป่วยโรคไข้เลือดออก สามารถติดเชื้อโรค ไข้เลือดออกได้					
16. ทุกคนมีโอกาสติดเชื้อโรคไข้เลือดออกได้เหมือนกัน					
17. เด็กมักจะเป็นโรคไข้เลือดออกได้มากกว่าผู้ใหญ่					
18. ผู้อาศัยในชุมชนที่มีผู้ป่วยเป็นโรคไข้เลือดออก มีโอกาสป่วยเป็นโรคไข้เลือดออกได้มากขึ้น					
19. การนอนกางมุ้งในเวลากลางวัน ทำให้ไม่ป่วยเป็นโรคไข้เลือดออก					
20. การมีแหล่งเพาะพันธ์ยุงที่แพร่เชื้อโรคไข้เลือดออกในบริเวณ บ้าน ทำให้มีโอกาสเป็นโรคไข้เลือดออกง่ายขึ้น					
<u>การรับรู้ความรุนแรงโรคไข้เลือดออก</u> 21. เด็กที่ป่วยเป็นโรคไข้เลือดออกมีโอกาสเสียชีวิตมากกว่าผู้ใหญ่					
22. โรคไข้เลือดออกมีผลกระทบต่อใช้ค่าจ่ายในการรักษาของครอบครัว					
23. โรคไข้เลือดออกเป็นโรคที่รักษาได้					
24. ถ้าป่วยเป็นโรคไข้เลือดออกครั้งที่สอง จะมีอาการรุนแรงมากขึ้น					
25. เมื่อป่วยเป็นโรคไข้เลือดออกและได้รับการรักษาที่ไม่เหมาะสม อาจเกิดภาวะแทรกซ้อนได้					

เนื้อหา	เห็นด้วยอย่างยิ่ง	เห็นด้วย	ไม่แน่ใจ	ไม่เห็นด้วย	ไม่เห็นด้วยอย่างยิ่ง
<u>การรับรู้ประโยชน์ของการป้องกันโรคไข้เลือดออก</u> 26. การกำจัดแหล่งเพาะพันธ์ยุงที่เป็นพาหะโรคไข้เลือดออก สามารถลดจำนวนผู้ป่วยไข้เลือดออก					
27. การทายากันยุง สามารถลดการป่วยเป็นโรคไข้เลือดออกได้					
28. การนอนกางมุ้งตอนกลางวัน สามารถลดการป่วยเป็นโรคไข้เลือดออกได้					
29. การป้องกันโรคไข้เลือดออก จะช่วยลดภาระในการดูแลของครอบครัว					
30. การป้องกันโรคไข้เลือดออก จะช่วยลดการสูญเสียรายได้ของครอบครัว					
<u>การรับรู้อุปสรรคของการป้องกันโรคไข้เลือดออก</u> 31. การป้องกันโรคไข้เลือดออกเป็นเรื่องยากที่จะควบคุมโรคได้ เพราะมียุงเป็นตัวแพร่กระจายโรค					
32. การนอนในมุ้งตอนกลางวันเป็นเรื่องที่ยุ่งยาก ไม่สะดวกต่อการปฏิบัติ					
33. การใส่เสื้อแขนยาว กางเกงขายาวเพื่อป้องกันยุงกัดเป็นเรื่องไม่สะดวก					
34. การขัดล้างและ เปลี่ยนน้ำในภาชนะในบ้าน ทุกสัปดาห์เป็นเรื่องยุ่งยาก					
35. การขัดล้างและ เปลี่ยนน้ำในภาชนะในบ้าน ทุกสัปดาห์ทำให้เสียเวลา และค่าใช้จ่าย					
36. การพ่นหมอกควัน สารเคมีมีกลิ่นเหม็น เป็นอันตราย ต่อสุขภาพ					
37. การกำจัดแหล่งเพาะพันธุ์ยุงในบริเวณบ้านเป็นเรื่องยุ่งยาก					

<u>ส่วนที่ 4. ปัจจัยชี้นำ หรือสิ่งกระตุ้นในการปฏิบัติ</u>

โปรดเลือกข้อที่ตรงกับประสบการณ์ หรือพฤติกรรมของท่านที่ปฏิบัติอยู่มากที่สุด

38. การมีคนในครัวเรือน หรือ เพื่อน เป็นโรคไข้เลือดออก ทำให้เกิดการป้องกันไข้เลือดออก

( )ใช่ ( ) ไม่ใช่

39. คำแนะนำจากบุคคลากรสาธารณสุขทำให้ท่านเกิดพฤติกรรมการป้องกันโรคไข้เลือดออก

( )ใช่ ( ) ไม่ใช่

40. การได้รับข่าวสารจากสื่อสารมวลชนต่างๆ ทำให้เกิดการป้องกันโรคไข้เลือดออก

( )ใช่ ( ) ไม่ใช่

41. การมีทรายอะเบทพร้อมใช้ในบ้าน ทำให้เกิดการป้องกันโรคไข้เลือดออก

( )ใช่ ( ) ไม่ใช่

<u>ส่วนที่ 5.พฤติกรรมเกี่ยวกับการป้องกันโรคไข้เลือดออก</u>

พฤติกรรมเกี่ยวกับการป้องกันไข้เลือดออก	ประจำ	เกือบประจำ	บางครั้ง	นานๆครั้ง	ไม่เคยทำ
1. ท่านปิดฝาภาชนะเก็บกักน้ำหรือไม่					
2. ท่านเปลี่ยนน้ำในแจกัน ที่รองตู้กับข้าวและภาชนะที่ไม่มีฝาปิด ทุกสัปดาห์หรือไม่					
3. ท่านขัดล้างภาชนะเก็บกักน้ำทุกสัปดาห์หรือไม่					
4. ท่านปล่อยปลานกยูง ในภาชนะเก็บกักน้ำนอกบ้านหรือในภาชนะที่ไม่มีฝาปิดหรือไม่					
5. ท่านใส่ทรายอะเบทในภาชนะเก็บกักน้ำที่ไม่มีฝาปิดหรือไม่					
6. ท่าน กำจัด กระป๋อง ขวดน้ำ ยางเก่าหรือ ภาชนะที่เก็บน้ำในบริเวณบ้านทุกสัปดาห์หรือไม่					
7. ท่านหรือ บุตรหลานนอนในมุ้งในเวลากลางวันหรือไม่					
8. ท่านทายากันยุงเวลาออกนอกบ้านหรือไม่					
9. ท่านใส่เสื้อแขนยาว กางเกงขายาวเพื่อป้องกันยุงกัดหรือไม่					

ขอขอบพระคุณที่ตอบแบบสอบถาม

ผู้วิจัย

คณะกรรมการจริยธรรมการทำวิจัยในคนโรงพยาบาลพระนครศรีอยุธยา

หนังสือรับรองเลขที่ ๐๐๔/๒๕๕๗

ชื่อโครงการวิจัย พฤติกรรมการป้องกันไข้เลือดออกของประชาชนอายุตั้งแต่ ๑๘ ปี ขึ้นไป ในเขตเทศบาลนครพระนครศรีอยุธยา จังหวัดพระนครศรีอยุธยา

ชื่อผู้วิจัยหลัก นางสาวดวงพร อัศวราชันย์
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หน่วยงานที่รับผิดชอบ สถาบันสุขภาพอาเซียน มหาวิทยาลัยมหิดล

สถานที่ดำเนินการวิจัย โรงพยาบาลพระนครศรีอยุธยา

เอกสารที่พิจารณา โครงร่างวิจัย

วันที่พิจารณาอนุมัติ

คณะกรรมการวิจัยโรงพยาบาลพระนครศรีอยุธยา ได้พิจารณาโครงการฉบับภาษาอังกฤษแล้ว คณะกรรมการฯ พิจารณาอนุมัติในแง่จริยธรรมและให้ดำเนินการวิจัย ข้างต้นภายในโรงพยาบาลพระนครศรีอยุธยา ทั้งนี้โดยยึดตามเอกสารฉบับภาษาไทยเป็นหลัก

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