FACTORS ASSOCIATED TO PREVENTIVE BEHAVIOR ON DENGUE HEMORRHAGIC FEVER AMONG FAMILY LEADERS IN BAN CHANG-LO, BANGKOK-NOI BANGKOK

SOMCHAI TEETIPSATIT

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF PRIMARY HEALTH CARE MANAGEMENT FACULTY OF GRADUATE STUDIES MAHIDOL UNIVERSITY

2005

ISBN 974-04-5671-5

Thesis
entitled

FACTORS ASSOCIATED TO PREVENTIVE BEHAVIOR ON DENGUE HEMORRHAGIC FEVER AMONG FAMILY LEADERSIN BAN CHANG-LO, BANGKOK-NOI, BANGKOK

……..
Mr. Somchai Teetipsatit
Candidate

…….
Assoc. Prof. Charnchudhi Chanyasanha
Ph.D.
Major-Advisor

…….
Assoc. Prof. Dusit Sujirarat
M.Sc.
Co-Advisor

…….
Asst. Prof. Wonpen Kaewpan
Dr.P.H.
Co-Advisor

……
Assoc. Prof. Rassmidara Hoonsawat
Ph.D.
Dean
Faculty of Graduate Studies

…….....
Assoc. Prof. Sirikul Isaranurug
M.D., Dip. Thai Board of Pediatrics
Chair
Master of Primary Health Care Management
ASEAN Institute for Health Development

Thesis
entitled

FACTORS ASSOCIATED TO PREVENTIVE BEHAVIOR ONDENGUE HEMORRHAGIC FEVER AMONG FAMILY LEADERSIN BAN CHANG-LO, BANGKOK-NOI, BANGKOK

was submitted to the Faculty of Graduate Studies, Mahidol University

for the degree of Master of Primary Health Care Management

on
March 09, 2005

…….
Mr. Somchai Teetipsatit
Candidate

……
Assoc. Prof. Charnchudhi Chanyasanha
Ph.D.
Chair

……
Assoc. Prof. Dusit Sujirarat
M.Sc.
Member

.....
Asst. Prof. Pongrama Ramasoota
Ph.D.
Member

…….
Asst. Prof. Wonpen Kaewpan,
Dr. P.H.
Member

……
Assoc. Prof. Rassmidara Hoonsawat
Ph.D.
Dean
Faculty of Graduate Studies
Mahidol University

…….....
Assoc. Prof. Sirikul Isaranurug
M.D., Dip. Thai Board of Pediatrics
Chair
ASEAN Institute for Health Development
Mahidol University

ACKNOWLEDGEMENT

This thesis would not have been possible without the help and support of many people.

I express my deep sincere of gratitude toAssociated Professor Dr. Charnchudhi Chanyasanha, my major advisor, for his guidance invaluable advice supervision, and encouragement support throughout this study. My appreciation and gratitude are also extended to Associated Professor Dusit Sujirarat and Assistant Dr. Wonpen Kaewpan, my co-advisor for their kind advise and suggestion during this study. I also express my very grateful appreciation to Assisstant Professor Dr. Pongrama Ramasoota, my thesis committee, for their constructive comments and valuable recommendations for this study.

I would like to thank all of the experts who gave helpful suggestions concerning the research instruments. Special thank to public health center no.3o wat chao aum, for their help and assistance in data collection. This research would not be succeeded without great cooperation from family leaders in Ban chang lo, Bangkok noi in this study. I would like to thank all of them.

I am very grateful to TICA/JICA for the partial financial support to this study. Finally thank to my family and my friends for their support and encouragement throughout my study.

Somchai Teetipsatit

FACTORS ASSOCIATED TO PREVENTIVE BEHAVIOR ON DENGUE HEMORRHAGIC FEVER AMONG FAMILY LEADERS IN BAN CHANG-LO, BANGKOK-NOI BANGKOK

SOMCHAI TEETIPSATIT 4737961 ADPM / M

M.P.H.M. (PRIMARY HEALTH CARE MANAGEMENT)

THESIS ADVISORS : CHARNCHUDHI CHANYASANHA, Ph.D., DUSIT SUJIRARAT, M.Sc., WONPEN KAEWPAN, Dr.P.H., PUBLIC HEALTH ADMINISTRATION.

ABSTRACT

This study was a descriptive research aiming to examine preventive behaviors on dengue hemorrhagic fever (DHF) among family leaders in Ban Chang -lo, Bangkok- noi, Bangkok. The factors studied were age, sex, religion, education, occupation, family income, knowledge, attitude, adequate resources, information and support and supervision from public health officers on DHF. The sample was comprised of 414 family leaders who were interviewed by the public health officers from Wat Choa Aum health center no. 30. Data were collected with questionnaires and were subsequently analyzed with descriptive, percentage, mean and analytic statistics with chi square and Pearson 's correlation.

The results of this study showed that overall preventive behaviors of family leaders on dengue hemorrhagic fever were at a moderate risk of 65% and a high risk of 14.7%. Age, sex, education, occupation, family income and attitude were not significantly associated with preventive behavior on dengue hemorrhagic fever.

There were significant associations between religion, knowledge, adequate resources, information from media, and support and supervision from health officers with preventive behavior on DHF among family leaders ($p = <0.001$).

The results show that public health officers and participation of the family leaders and outsourcing from other media have a role in preventive behavior among people in the community. Emphasizing supervision and support will be effective in prevention and control of dengue hemorrhagic fever.

KEY WORDS: ASSOCIATED FACTORS/ PREVENTIVE BEHAVIOR/ DENGUE HEMORRHAGIC FEVER/ FAMILY LEADERS/ BANGKOK

113 P. ISBN : 974-04-5671-5

CONTENTS

Page

CONTENTS (Cont.)

LIST OF TABLES

TABLE Page

LIST OF TABLES (Cont.)

TABLE Page

LIST OF FIGURES

FIGURE Page

LIST OF ABBREVIATIONS

AMR	:	Americas Region.
BMA	:	Bangkok Metropolitan Administration.
DF	:	Dengue fever
DHF	:	Dengue hemorrhagic fever.
et al	:	Et alli (Latin), and other
No.	:	Number
WHO	:	World Health Organization..
WPR	:	Western Pacific Region.
SD	:	Standard deviation
SEAR	:	South-east Asia Region.

CHAPTER 1
INTRODUCTION

1.1 Rational and justification

During the 19th century, dengue was considered a sporadic disease, causing epidemics at long intervals. However, dramatic changes in this pattern have occurred and currently, dengue ranks as the most important mosquito borne viral disease in the world. In the past 50 years, its incidence has increased 30-folds with significant outbreaks occurring in five of six World Health Organization (WHO) regions. At present, dengue is endemic in 112 countries in the world [1, 2].

Around 2.5 to 3 billion people, living mainly in urban areas of tropical and subtropical regions, are estimated to be at risk of acquiring dengue viral infections. Estimates suggest those annually 100 million cases of dengue fever and half a million cases of dengue hemorrhagic fever (DHF) occurs in the world with a case fatality in Asian countries of 0.5%–3.5% [3]. Of those with DHF, 90% are children less than 15 years of age [2].

DHF first emerged as a public health problem in 1954, when the first epidemic occurred in Manila. This gradually spread to other countries in the region. Major epidemics occurred in other regions of the world in the 1980s and 1990s and were caused by all four dengue viral serotypes [4]. While the predominant serotype in the 1980s and the early 1990s was DEN-2, in recent years it has changed to the DEN-3 serotype [5, 6]. In 1998, a pandemic of dengue viral infections occurred, where 1.2 million cases of dengue fever and DHF were reported from 56 countries worldwide. The world population was exposed to a new subtype of the DEN-3 virus (subtype III), which originated in the Indian subcontinent and later spread to involve other continents [7]. Exposure of a non-immune population to this new subtype of DEN-3

may have been the cause of this pandemic. A situation of comparable magnitude was also seen in 2001–02.

From mid-80s DHF outbreaks have been reported annually in the American tropics as well, where formerly multiple types of dengue viruses circulated simultaneously without resulting in substantial numbers of DHF cases (Halstead, 1998s). In Southeast Asia the mean number of annual cases of dengue hemorrhagic fever has increased from below 10,000 in the 1959s and 60s to over 200,000 in the 1990s. The same pattern is now unfolding in the Americas Gubler, 1997; Gibbon and Vaughn, 2002).[9-11] With increasing air travel people from non-epidemic areas serve an important double role as potential victims of dengue fever and as vehicles for the further spread of the disease [8].

In Thailand, dengue hemorrhagic fever is one of the most important infectious diseases for many decades. Over the past 40 years the numbers of infected patients has been rising steadily (Nimmannitya, 1997; Kantachuvessiri, 2002) [9-11]. The epidemic pattern has changed from one of alternate years to an irregular pattern. According to a report on dengue hemorrhagic fever in Thailand from 2001, 2002, and 2003, the mortality rate of dengue hemorrhagic fever were 0.38, 0.16, 0.13 per 100,000 populations, respectively.

Bangkok, the capital city of Thailand, It is one of the largest city in Southeast Asia, The province covers an estimated area of 15,687 square kilometers, located at central region of Thailand which is below plain and 2.31 meters above the sea level. It is dividing into 50 districts. The population is approximately 5.8 million in the year 2003. Population density varies considerably from place to place in the city, average about 3,726 persons per square kilometers, and Bangkok-noi district the population density is about 12,799 persons per square kilometers comparing to the average in Bangkok, so it is quite high density of population in this area (Annual Epidemiological Surveillance Report 2003, BMA) [12]. After epidemic from 1958, outbreaks of DHF were occurred, and now Bangkok is an endemic area of DHF. Since DHF epidemic in 1958 it become as a major public health problem from year to

year. Bangkok has epidemic of DHF for every year. Referring to the report on acute hemorrhagic fever, the numbers of patients from the year 1999 to 2003 were 5,437, 5,241, 16,734, 9,357 and 8,302 respectively. During January-October 2004, there were 3,787 patients with disease; the mortality rate was 0.03 per 100,000 persons. These data indicated that Bangkok still has problems of acute dengue hemorrhagic fever epidemic. The 9th National Plan of Social and Economic Development (202-2006) aims to reduce the morbidity rate of acute dengue hemorrhagic fever less than 22 per 100,000 persons or to control and prevent the disease to the level that it is not a health problem for Thai population (National Health Development Plan the 9th National Plan of Social and Economic Development 2002-2006) [13]. However, dengue hemorrhagic fever is still a serious health problem in Bangkok especially in Bangkok-noi district which has the problem in epidemic of disease every year and ranked in 14th out of 50 districts in Bangkok (January- October 2004). The programs for the prevention and control of the disease were introduce in the community, school, temple, training program for the health volunteers or even for the health officer. But we still are facing to the problem of acute dengue hemorrhagic fever. The problem may be due to the discontinuous and irregular conduct or it might be unawareness of the people in the community toward the preventive behavior in the aspect of eradication of Aedes mosquito, the larvae of mosquito and the places of the larva breeding.

As the mention above on the problem of the dengue hemorrhagic fever which still be the health problem in Bangkok-noi district, from the data since 1999-2003 Bangkok-noi is one of the epidemic area in Bangkok and Ban Chang-lo is the highest prevalence rate of epidemic in Bangkok-noi even though all of the programmed and project from the Department of Health in Bangkok are lodged in the same as the others district but since then Ban Chang-lo still has very high prevalence rate comparing to the others sub-districts (Bang khunsri, Bang khunnon, Arunam-marin,and Siriraj).

From the reason above in this study it interested to know what the factors are associated in this area that causing the persistent of epidemic of dengue hemorrhagic

fever and want to examine the preventive behavior on dengue hemorrhagic fever among the family leaders. In this study used PRECEDE PROCEED Model as the analysis framework to find out the factors that affect to the preventive behavior on dengue hemorrhagic fever among family leaders because this model can be analyzed and cover all aspect of the behavior and suitable to the problem in this area. The results of this study could be applied to the promotion of appropriate prevention and control behavior on dengue hemorrhagic fever among the family leaders in Bangkok-noi and apply to other areas as well.

1.2 Research question

1. What are the factors associated to the preventive behavior on dengue hemorrhagic fever among family leaders in Ban Chang-lo Sub-district?
2. Are there any association between the predisposing factors, enabling factors and reinforcing factors with the preventive behavior among family leaders in Ban Chang-lo Sub-district?

1.3 Objective

1.3.1 General objectives

To study about the preventive behaviors among family leaders in Ban Chang-Lo sub-district, Bangkok-noi, Bangkok and to identify the association between factors associated to preventive behavior on dengue hemorrhagic fever in family leaders.

1.3.2 Specific objectives

1.3.2.1 To determine the preventive behavior among family leaders.

1.3.2.2 To analyze the association between socio-demographic, predisposing factors including age, sex, religion, education, occupation, family income, knowledge and attitude in preventive behavior on dengue hemorrhagic fever among family leaders.

1.3.2.3 To analyze the association between the enabling factors including adequate resources with the preventive behaviors on dengue hemorrhagic fever among family leaders.

1.3.2.4 To analyze the association between the reinforcing factors including information of mass media, supporting and supervision from health officer with the preventive behavior on dengue hemorrhagic fever.

1.4 Hypothesis of the study

1.4.1 Socio-demographic factors (age, sex, religion, occupation, and family income) are associated to the preventive behavior among family leaders.

1.4.2 Predisposing factors. (Knowledge and attitude) are associated to the preventive behavior on dengue hemorrhagic fever among family leaders.

1.4.3 Enabling factors (Resources for the preventive behavior of dengue hemorrhagic fever) are associated to the preventive behavior among the family leaders.

1.4.4 Reinforcing factors (Information, supporting and supervision of health officers) are associated to the preventive behavior among family leaders.

1.5 Scope of study

This research study on factors associated to the preventive behaviors on dengue hemorrhagic fever among family leaders in Ban Chang-lo sub-district, Bangkok-noi, Bangkok. The number samples are 414 persons from 14 communes in Ban Chang-lo. Collected data from January 2005 to February 2005.

1.6 Limitation of study

This study will be carried out in the dry season, so the family leaders might pay less attention on the prevention. The data will be obtained through asking questionnaires which may cause some missing in some variables and the study has limited of time.

1.7 Variable in this study

Independent variables

1. Socio-demographic
   - 1.1 age
   - 1.2 sex
   - 1.3 religion
   - 1.4 education
   - 1.5 occupation
   - 1.6 family income
2. Predisposing factors
   - 2.1 knowledge in prevention on dengue hemorrhagic fever
   - 2.2 attitude in prevention on dengue hemorrhagic fever
3. Enabling factors

   Adequate resources for prevention on dengue hemorrhagic fever
4. Reinforcing factors
   - 4.1 information of dengue hemorrhagic fever from media
   - 4.2 supporting and supervision from public health officer

Dependent variable

Preventive behavior on dengue hemorrhagic fever:

- Prevention and get rid of breeding places
- Prevention and control larvae
- Prevention mosquito bite (man-mosquito contact)

1.8 Operational definition

1. **Family leaders**: define as person who influenced about health in the family.

2. Socio-demographic factors: such as socioeconomic status, age, sex, social status based on income, education, occupation is health-related behavior

2.1 Age: Define as family leader's age in ranged of year, counting from date of birth of study.

2.2 Sex: defined as sex of family leaders male and female.

2.3 Religion: defined as the religion that family leaders were respected.

2.4 Education: Defined as number of years in study of family leader, categorized into seven groups: illiteracy, primary school (grade 1-6), secondary school, high school, diploma, bachelor degree or equal, more than bachelor degree.

2.5 Occupation: defined as job or work of family leader during the time of study, categorized into 7 groups: unemployed, housewife/husband, government officer, employee, labor, others.

2.6 Family income: Defined as the economic status of the family during the time of study. Using average income from National Statistic Department, Thailand divided into 3 levels as:

Low income	3,000	baht/month
Moderate income	3,001 to 7,000	baht/month
High income	7,001	baht/month

3. Predisposing factors: including knowledge and attitudes related to motivate of an individual or group to act in behavior.

3.1 Knowledge:

Good [14] defined knowledge as accumulate facts, truths, principle, and information to which the human mind has access.

Bloom [15] defined knowledge includes these behavior and test situation, which emphasize the remembering, either by recognition or recall, of ideas, material or phenomena.

In this study, knowledge refers to the knowledge of interviewees about the cause of DHF, mode of transmission of disease, clinical manifestation of disease, prevention of disease.

3.2 Attitude: Mucchielli describes attitude as a tendency of mind or of relatively constant feeling toward a certain category of objects, persons, or situations[16]. Kirscht viewd attitudes as a collection of beliefs that always includes an evaluative aspect. Attitudes can always be assessed as positive or negative. In this study regarding to prevention method such as tight cover, larvivorous fish, and discarded container removed, sleeping in the mosquito/mosquito screening net.

4. Enabling factors: facilitate the performance of an action by individuals or organizations. These conditions include the availability, accessibility, and affordability of health care and community resources. Enabling factors also include new skills that a person, organization, or community needs to carry out a behavioral or environmental change, but in this study use only adequate resources for the prevention on DHF.

4.1 Resources for the prevention on DHF: define as the sources that are utilized for prevention on DHF such as mosquito net, covers for water containers and Abate sand etc.

5. Reinforcing factors: those consequences of action that determine whether the actor received positive (or negative) feedback and is supported socially afterward. Reinforcing factors include social support, peer influences and advice and feedback by health care providers.

5.1 Information of dengue: Define as the information of family leaders about disease and prevention of dengue hemorrhagic fever from personnel or others sources of information such as television, radio, newspaper, brochure, leaflet, or announcement.

5.2 Supporting and Supervision from public health officer: define as the information about the disease of DHF, prevention and control, the news about the epidemic and rule and regulation of DHF from health officers.

6. Risk preventive behavior: Harris and Guten [17] defined 'Health preventive behavior" as any action take by the person is often and always in order to prevent the disease. Majority of the people generally takes actions or behaves with the objective of having good health and such could include sleeping, physical activities, personal health habits or self protection from the disease etc.

In this study include get rid of breeding places, prevention and control of larvae, prevention mosquito bite (man-mosquito contact) by sleep in mosquito/mosquito screening net.

7. Dengue fever (DF): occur either during primary or secondary infections. The onset is sudden with high fever, severe headache (especially in the retro-orbital area), arthralgia, myalgia, anorexia, abdominal discomfort, and sometimes a macular papular rash. The fever may be biphasic and tends to last for 2–7 days. Flushing, a characteristic feature is commonly observed on the face, neck, and chest. Coryza may also be a prominent symptom especially in infants. Younger children tend to present with coryza, diarrhoea, rash and seizure, and less commonly with vomiting, headache and abdominal pain although, hemorrhagic manifestations are uncommon in dengue fever, petechiae/pupura, gastrointestinal bleeding, epistaxis, and gingival bleeding has been observed in some individuals. A positive tourniquet test has been reported in many individuals with dengue fever possibly due to reduced capillary fragility.

8. Dengue hemorrhagic fever (DHF): complication form of dengue fever. Usually follows secondary dengue infections, but may sometimes follow primary infections. DHF is characterized by high fever, hemorrhagic phenomena, and features of circulatory failure. The WHO case definition of DHF is given in .For purposes of description DHF is divided into three phases, namely: febrile, leakage, and convalescent phases. Furthermore, according to severity DHF is divided into four grades as grade I. No shock, only positive tourniquet test. grade II. No shock has spontaneous bleeding other than a positive tourniquet test. grade III. shock. Grade IV profound shock with immeasurable blood pressure or/and pulse.

1.9 Conceptual framework

This study is identified the association between predisposing, enabling, and reinforcing factors in preventive behavior on dengue hemorrhagic fever among the family leaders in Ban Chang-Lo sub-district, Bangkok-noi, Bangkok about 414 persons from 14 communes. Based on the PRECEDE-PROCEED MODEL as shown in Figure 1

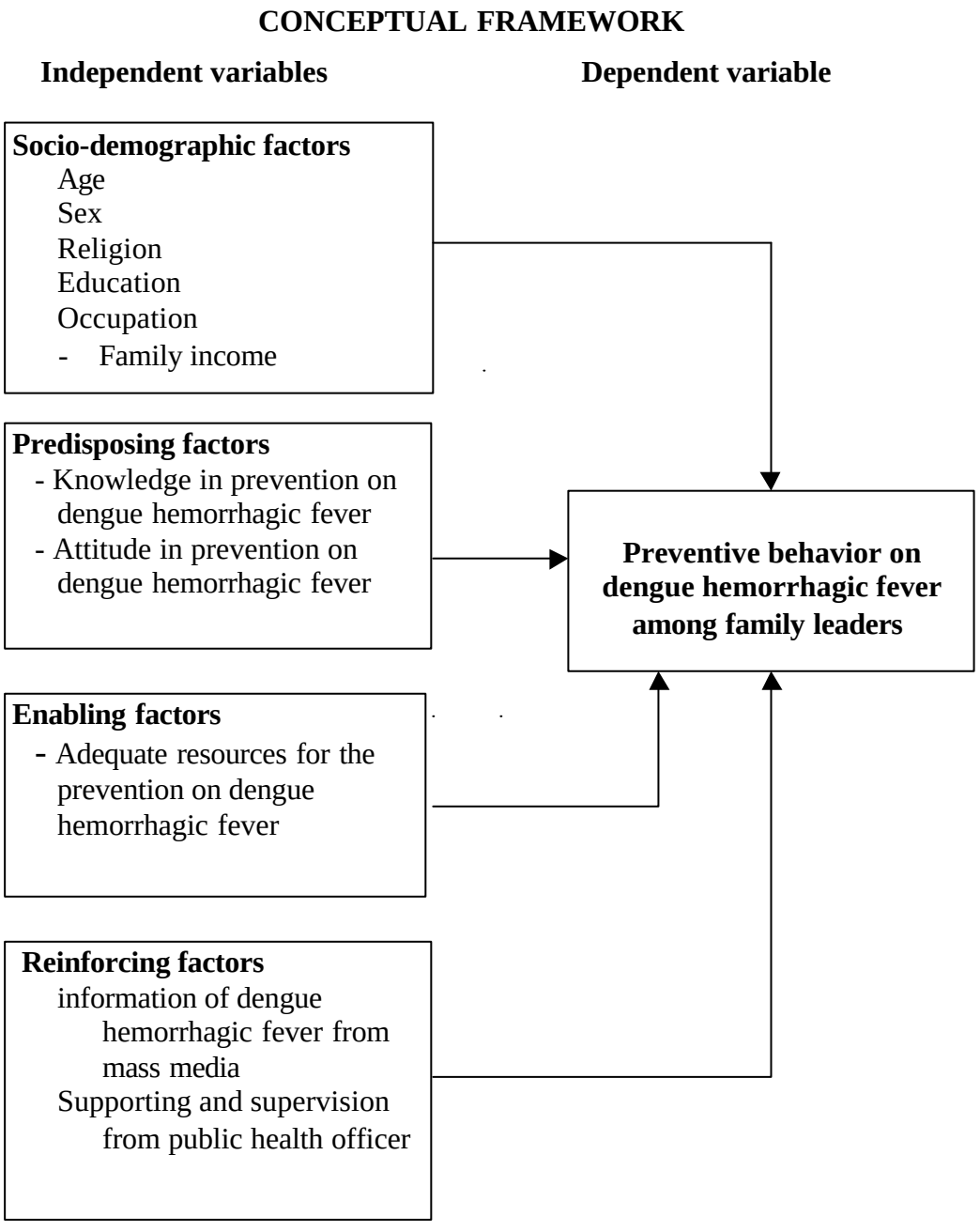


Figure 1 Conceptual framework of the study

CHAPTER 2
LITERATURE REVIEW

This study is cross-sectional descriptive study aiming to identify the factors Associated to preventive behavior on dengue hemorrhagic fever among family leaders in Ban Chang-lo Sub-district, Bangkok- noi, and Bangkok.

2.1 Overview of dengue hemorrhagic fever

2.1.1 DHF Situation

2.1.1.1 Global situation

During the 19th century, dengue was considered a sporadic disease, causing epidemics at long intervals. However, dramatic changes in this pattern have occurred and currently, dengue ranks as the most important mosquito borne viral disease in the world. In the past 50 years, its incidence has increased 30-fold with significant outbreaks occurring in five of six World Health Organization (WHO) regions. At present, dengue is endemic in 112 countries in the world [1, 2].

Around 2.5 to 3 billion people, living mainly in urban areas of tropical and subtropical regions, are estimated to be at risk of acquiring dengue viral infections. Estimates suggest those annually 100 million cases of dengue fever and half a million cases of dengue hemorrhagic fever (DHF) occur in the world with a case fatality in Asian countries of 0.5%–3.5% [3]. Of those with DHF, 90% are children less than 15 years of age [2].

DHF first emerged as a public health problem in 1954, when the first epidemic occurred in Manila. This gradually spread to other countries in the region. Major epidemics occurred in other regions of the world in the 1980s and 1990s and were caused by all four dengue viral serotypes [4]. While the predominant serotype in the 1980s and the early 1990s was DEN-2, in recent years it has changed to the DEN-3

serotype. [5,6] In 1998, a pandemic of dengue viral infections occurred, where 1.2 million cases of dengue fever and DHF were reported from 56 countries worldwide including over 3500 deaths. The pandemic largely affected the WHO Regions of the Americas (AMR), South-east Asia (SEAR) and the Western Pacific (WPR). More than 55% of the cases, mostly of dengue fever, and only 2% of the deaths, were reported from AMR. However, in this region, dengue fever and dengue hemorrhagic fever are reported separately, whereas in SEAR and WPR the data are aggregated and the great majority of reported cases are hospitalized cases of dengue hemorrhagic fever. The burden of severe disease remains proportionately much greater in the affected Asian and Pacific countries. Table I

Typical of post-epidemic periods, dengue activity was much lower in the year after the pandemic, but the number of reported cases increased to over 0.5 million in 2000. Preliminary data for the year 2001, up to September, for two of the three regions (AMR and SEAR), show a further, large increase of reported cases (>525, 913 cases) with nearly 500 deaths. These data suggest a level of activity comparable in magnitude with that of 1998.

The world population was exposed to a new subtype of the DEN-3 virus (subtype III), which originated in the Indian subcontinent and later spread to involve other continents [7]. Exposure of a non-immune population to this new subtype of DEN-3 may have been the cause of this pandemic. A situation of comparable magnitude was also seen in 2001–02.

Although sporadic dengue fever was known for more than 200 years, reasons for the global resurgence of epidemics of dengue fever and DHF are not very clear [4]. Uncontrolled population growth, unplanned and uncontrolled urbanization, inadequate wastewater management, and lack of effective mosquito control have been implicated in the increased distribution and density of the vector and also the increased spread of the virus [11]. However, microevolution of the dengue virus may have also contributed to the spread of more virulent strains around the world. In fact there is evidence that the more virulent genotypes of the virus are replacing the less

virulent genotypes, which may explain the global emergence of dengue infections [18].

Figure 2: Shows the world distribution of the predominant dengue mosquito vector and areas with epidemic dengue activity. During the period 1955–98, the average annual number of cases of dengue fever/DHF reported to the WHO is shown in fig 3 [2]

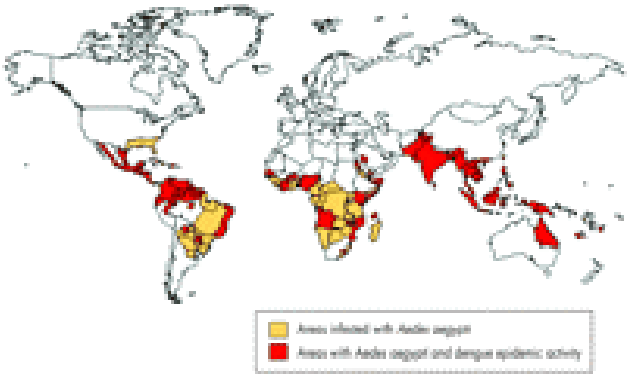


Figure 2 World distribution of the predominant dengue mosquito vector (*Aedes aegypti*) and areas with dengue epidemic activity.

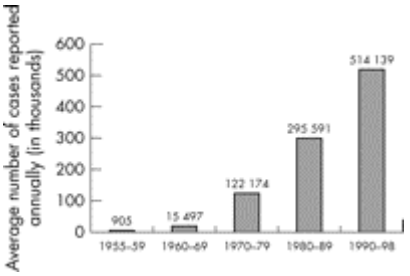


Figure 3 Dengue/DHF, average annual number of cases of reported to the WHO, 1955–98

Table 1 Cases of dengue fever and dengue hemorrhagic fever reported to WHO 1998-2001*

WHO Region	1998		1999		2000		2001*	
	cases	deaths	cases	deaths	cases	Deaths	cases	deaths
Western Pacific	356,554	1,470	64,066	112	45,603	167	NA	NA
South-East Asia	218,859	2,075	55,405	471	57,997	542	119,707	452
Americas (DF)	708,146	0	317,040	0	394,847	0	400,875	0
Americas (DHF)	12,426	83	5,216	98	5,667	92	5,331	44
Americas (total)	720,572	83	322,256	98	400,514	92	406,206	44
Eastern Mediterranean	No dengue cases reported to WHO (several countries are affected, including Pakistan, Somalia, Sudan)							
African	No dengue cases reported to WHO							
World	**1,295,985**	**3,628**	**441,727**	**681**	**504,114**	**801**	**525,913**	**496**

* Provisional data to September 2001
NA - data not available
DF: Dengue Fever
DHF: Dengue Hemorrhagic Fever
Only the Americas countries report DF and DHF separately.

2.1.1.2 Situation in South East Asia

The first epidemic of DHF in South East Asia occurred in 1954 in Manila, Philippines. Following this, epidemics have occurred in nearly all countries in this region, and currently are a major public health problem in seven of them. The incidence of DHF has increased dramatically in recent years with approximately five times more cases reported since 1980 than in the previous 30 years.[2] Although serological surveys conducted in Indonesia showed that DEN-1 and DEN-2 were the prevalent serotypes until the late 1980s, the DEN-3 serotype has been the predominant serotype in the recent outbreaks. In fact, DEN-3 has been associated with severe dengue epidemics and it has been suggested that the DEN-3 virus may have certain characteristics that make it more virulent. Although DEN–4 has been isolated in almost all epidemics, it is primarily detected in secondary dengue infections [19].

DHF (with an attack rate in the range 300–440 cases/100 000 population) is a leading cause of hospitalization in children in South East Asia. While this rate has

now fallen in Thailand (95–103 cases/100 000 population in 1997), [20]. Some countries such as Vietnam, still experience very high attack rates [21]. Although case fatality rates in most countries in South East Asia have declined and are now less than 1%, those in some countries still exceed 4%, mainly due to late admission to hospital, when the disease is at an advanced state [22]. In the newly industrialized countries such as Singapore and Malaysia, successful vector control programmed led to a gradual decline in the incidence of dengue, but even here resurgence has been seen since 1994 [22].

2.1.1.3 Situation in Thailand

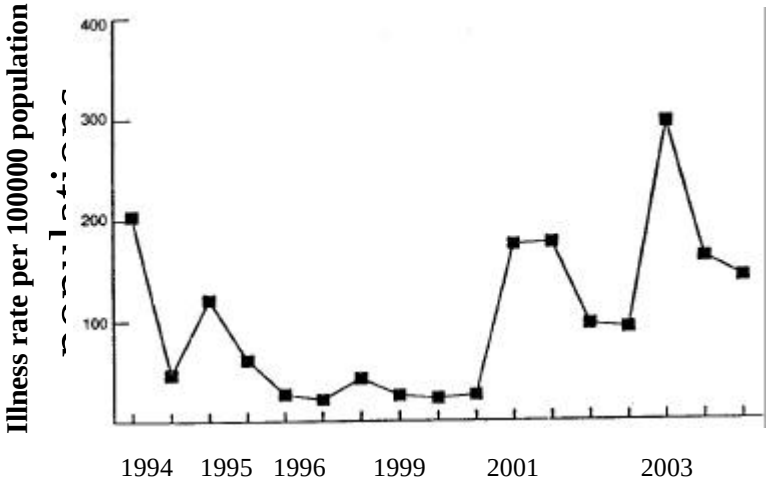
In Thailand, DHF is a very crucial problem, increasing incidence rate due to the geographic location as Tropical area. DHF was first reported in 1949 at Siriraj Hospital in Thailand [23]. About seven to eight years later, there were about 1,500 cases of reported illness and the mortality rate was 17% which was considered as a high rate. First recognized as an epidemic disease of children in Bangkok in 1958, it has become the major public health problems in Thailand (Nimmannitya, 1987) [24]. Most of infected cases lived in Bangkok and Thonburi Provinces. The number of infected people (DF/DHF) has since been rising steadily (Kantachuvessiri, 2002) [25]. In the recent years the epidemic pattern has been less predictable. Incidence rates ranked between 31.8 and 209.12 during the years 1989 to 1999(Saengtharatip, 1999) [26]. The incidence rate of DF/DHF infection in 2001, 2002, 2003 are 162.6, 174.78. 99.74 per 100,000 population, respectively.

2.1.1.4 Situation in Bangkok

In Bangkok, after epidemic from 1958, several outbreaks of DHF were occurred and now Bangkok is an endemic area of DHF, Since DHF epidemic in 1958 it become as a major public health problem from year to year. Bangkok has epidemic of DHF for every year. In 2003, Reporting of dengue fever, dengue hemorrhagic fever and dengue shock syndrome are about 8,302 cases or equal to 142.0 per 100,000 populations of illness and 9 cases were death or equal to 0.17 per 100,000 populations of mortality. Concerning with the illness of dengue hemorrhagic fever in

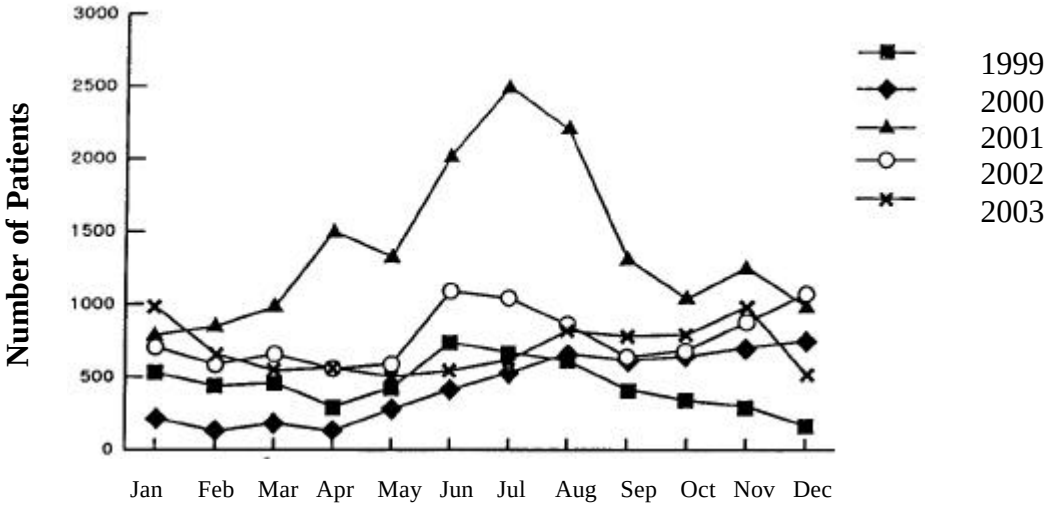
Bangkok from 1987 to 2003. We found out that in 2003 there was declining in the rate of illness comparing to the year of 2002(fig 1)

The distribution of patient monthly in last five years (1999-2003), there were difference in the distribution of the disease no definite seasoning of epidemic. In 2003 numbers of patient are continuous increasing from the previous year (2002) and decreasing in the following months, such during February to July number of patients more or less the same number. And the number of patients will increase again during August and the highest prevalence is in November. But during December the numbers of patients were declined as show in fig 2. Comparing with the previous five years (1998-2002), Number of patients was increasing in two peaks as early year and late in the end of the year as shown in figure: 4



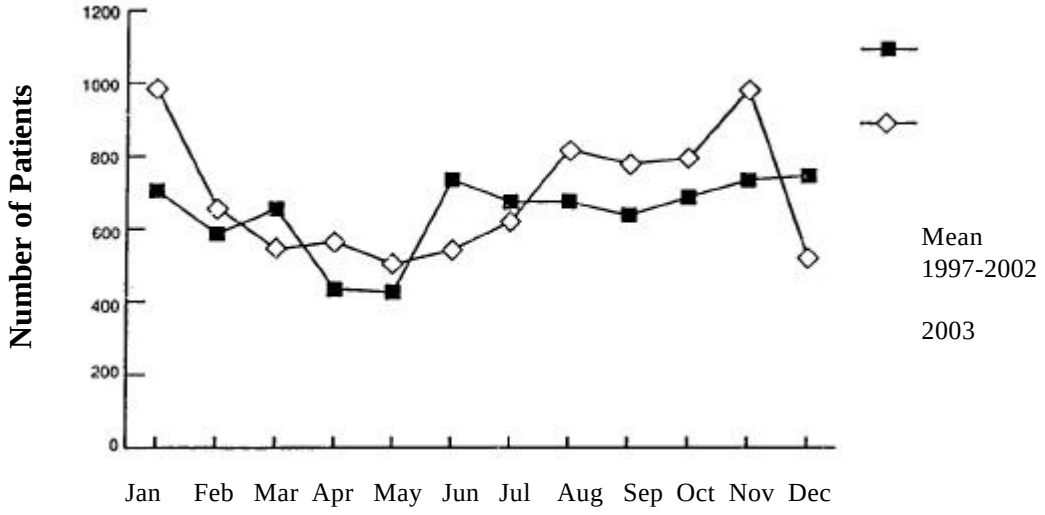
Source : From epidemiology Division Control disease of Department of Public Health, BMA

Figure 4 Illness rate of Dengue hemorrhagic fever per 100,000 populations in Bangkok from 1987-2503



Source: From Epidemiology Division Control disease of Department of Public Health, BMA

Figure 5 Number of Dengue hemorrhagic fever patients, reporting monthly in Bangkok from 1999-2003



Source From epidemiology Division control disease of Department of Health, BMA

Figure 6 Number of Dengue hemorrhagic fever patients, reporting monthly in Bangkok from 2503 comparing the median from last 5 years (1998-2002)

The number of the patients more or less the same as male and female (1:1). Most of the infected patient are highest in young age group between 10-14 years old about 446.03 per 100,000 populations follow 5-9 year old and 15-24 year old about 366.87, 254.48 per 100,000 populations, respectively. The number of patients in between 35 years old up were least groups comparing to the others young age group but observing that the number of this group are increasing every year.

Bangkok-noi is one of the district of Bangkok which has high prevalence rate of dengue hemorrhagic fever, especially in Ban Chang-Lo Sub-district still has the problem in the epidemic of dengue hemorrhagic fever as shown in Table 1. Comparing of the number of patients in between Bangkok-noi, Bangkok and the whole country of Thailand.

Table 2 Number of illness and death among Bangkok-noi, Bangkok, and whole country

Year	**Bangkok-noi**		**Bangkok**		**Whole Country**	
	I	D	I	D	I	D
1999	91	0	5,437	6	23,968	56
2000	57	1	5,241	6	16,285	30
2001	250	1	16,734	25	132,082	238
2002	171	1	9,357	8	108,905	172
2003	243	0	8,302	9	62,635	79

I = Illness D = Death

Source Epidemiology Division Control disease of Department of health,BMA, 2003.

2.1.2 Socio-economic Impact of DHF

The social and economic impact of DHF in Thailand has been estimated by Sornmani et al (1995) [27]. in extrapolation of the economic burden of DHF on the country and its people, it was found that with average epidemic (85/100,000), the total burden would be 788.06 million Baht(31.48 million US dollar)per year; if the

epidemic level is high(150/100,000), the total burden would be 1287.09 million Baths (51.49 million US dollar) per year.

2.2 KNOWLEDGE ABOUT DF/DHF

2.2.1 Etiology/ Transmission

Illness begins abruptly with a minor stage characterized by fever, cough, pharyngitis, headache, and anorexia, nausea vomiting and abdominal pain which is often severe. This continues for 2 to 4 days. In contrast to classic dengue, myalgia, arthalgia, and bone pain are unusual. Physical signs include fever varying from 38.3 to 40.6 ^{o}c (102 to 105 ^{o}F). The initial state is followed by abrupt deterioration, with the rapid onset of lassitude and weakness.

There are at least four distinct antigenic types of dengue virus, members of the family Flaviviridae (Den-1,Den-2,Den-3and Den-4). The most efficient vector is the female Aedes agypti. This mosquito is domestic, day-bite with low and limited flying movements. It has been reported that although antigenetically close to each other, they must give only partial cross –protection, after being infected by any of them. Three other *aeboviruses*, Chikungunya, O'nyong-nyong and west nile fever, have been identified with dengue-like diseases

Table 3 Vectors and geographic distribution of dengue-like diseases

Genus	Virus and disease	vector	Geographic distribution
Togavirus	Chikugunya	Aedes aegypti Aedes africanus	Africa, India, Southeast Asia
Togavirus	O'nyong-nyong	Anopheles Fenestus	East Africa
Flavivirus	West Nile fever	Culex molestus Culex univittatus	Europe, Africa. Middle east, India

Source:Scott B. Halstead: Nelson Textbook of Pediatrics, 17th ed., Chapter 246, 1092.

Dengue-like diseases may also occur in epidemics. Epidemiologic features depend on the vector and their geographic distribution (see Table 3). Chikugunya virus is widespread in the most populous areas of the world. In asia, A. aegypti is the principle vector; in africa, other Stegomyia may be important vectors. In Southeast Asia, dengue and Chikugunya outbreaks occur concurrently. Outbreaks of o'nyong-nyong and West nile fever usually involve villages or small towns, in contrast to urban outbreaks of dengue and chikugunya.

2.2.2 Epidemiology

The highest incidence of dengue is in Southeast Asia, India and the American tropics, where A. aegypti can be found. In the 1980s, dengue emerged in explosive epidemics in Rio de Janeiro (1986-serotype 1 and 1990- serotype 2 was isolated in Nitteri city) [28]. In areas such as Southeast Asia, where all four dengue virus types are hyper endemic, children are most exclusively affected, and seroprevalence approaches 100% by young adulthood.

2.2.3 Clinical Manifestations

Dengue infections may be asymptomatic or give rise to undifferentiated fever, dengue fever, DHF, or dengue shock syndrome. The differential diagnosis of dengue fever are infectious mononucleosis, chickengunya viral infections, Coxsackie and other enteroviral infections, Rubella, Paravirus B19 infections, Leptospirosis, Influenza while dengue hemorrhagic fever are Leptospirosis, Chikengunya viral infections, Kawasaki disease, Yellow fever, Hanta viral infections, Other viral haemorrhagic fevers, Meningococcal septicaemia.

2.2.3.1 Undifferentiated fever

This usually follows a primary infection but may also occur during a secondary infection. Clinically it is indistinguishable from other viral infections.

2.2.3.2 Dengue fever

Dengue fever may occur either during primary or secondary infections. The onset is sudden with high fever, severe headache (especially in the retro-orbital area),

arthralgia, myalgia, anorexia, abdominal discomfort, and sometimes a macular papular rash. The fever may be biphasic and tends to last for 2–7 days [29, 30]. Flushing, a characteristic feature is commonly observed on the face, neck, and chest. Coryza may also be a prominent symptom especially in infants [31]. Younger children tend to present with coryza, diarrhoea, rash and seizure, and less commonly with vomiting, headache, and abdominal pain [32].

Although, hemorrhagic manifestations are uncommon in dengue fever, petechiae/pupura, gastrointestinal bleeding, epistaxis, and gingival bleeding have been observed in some individuals [29, 33]. A positive tourniquet test has been reported in many individuals with dengue fever possibly due to reduced capillary fragility [34, 35]. Recovery from dengue fever is usually uneventful, but may be prolonged especially in adults.

2.2.3.3 Dengue hemorrhagic fever

DHF usually follows secondary dengue infections, but may sometimes follow primary infections, especially in infants. In such infants, maternally acquired dengue antibodies are presumed to enhance primary infections [36, 37]. Such a phenomenon has not been described in human infections other than dengue. DHF is characterized by high fever, hemorrhagic phenomena, and features of circulatory failure [38, 39] The WHO case definition of DHF is given in .For purposes of description DHF is divided into three phases—namely: febrile, leakage, and convalescent phases. Furthermore, according to severity DHF is divided into four grades .

2.2.4 WHO case definition of DHF

A patient with the following four criteria:

1. Acute sudden onset of high fever for 2–7 days.
2. Hemorrhagic manifestations with at least a positive tourniquet test.
3. Platelet count $<100 \times 10^9$/l.
4. Haemoconcentration (rising packed cell volume >20%) or other evidence of plasma leakage—for example, as cites, pleural effusions, low level of serum protein/albumin.

2.2.5 Grading of DHF

Grade I: no shock: only positive tourniquet test.

Grade II: no shock; has spontaneous bleeding other than a + tourniquet test

Grade III: shock.

Grade IV: profound shock with immeasurable blood pressure or/and pulse.

Dengue shock syndrome

Dengue shock syndrome is associated with very high mortality (around 9.3%, increasing to 47% in instances of profound shock) [40]. Severe plasma leakage leading to dengue shock syndrome is associated with cold blotchy skin, circumoral cyanosis, and circulatory disturbances. Acute abdominal pain and persisting vomiting are early warning signs of impeding shock [41]. Sudden hypotension may indicate the onset of profound shock [42]. Prolonged shock is often accompanied by metabolic acidosis, which may precipitate disseminated intravascular coagulation or enhance ongoing disseminated intravascular coagulation, which in turn could lead to massive hemorrhage. Dengue shock syndrome may be accompanied by encephalopathy due to metabolic or electrolyte disturbances.

2.2.6 Diagnosis

Hematological investigations

Low platelet counts of $<100 \times 10^9$/l.

Leucopenia early in the illness.

Atypical lymphocytosis (>15%).

Abnormal coagulation profile (prolonged activated partial thromboplastin time, prothrombin time, raised fibrinogen degradation products).

Reduced serum complement levels.

2.2.7 MANAGEMENT OF DENGUE INFECTIONS

Management of dengue infections is mainly symptomatic, as there are no specific drugs effective against the dengue virus. Proper maintenance of fluid balance is a cornerstone in management. Early identification of the leakage phase with

prompt resuscitation helps to reduce complications and improve outcome. Mortality rates have been low in patients admitted early to hospital before the onset of shock.

2.2.7.1 Management of dengue fevers

Both dengue fever and the febrile phase of DHF are managed similarly. Paracetamol is the only antipyretic recommended for use, since other non-steroidal anti-inflamatory drugs such as aspirin or diclofenac sodium may result in gastric irritation or provoke gastrointestinal bleeding. The recommended dose of paracetamol (60 mg/kg/day) should not be exceeded, as otherwise liver injury that accompanies dengue viral infections may be aggravated. If the temperature still remains high despite administrationof paracetamol, tepid sponging is recommended.

A soft, balanced, and nutritious diet is recommended changing to oral rehydration fluids if a soft diet is refused. An antiemetic such as domperidone may be used to treat vomiting. A gastric mucosal protective agent such as cimetidine may be given to patients with evidence of gastrointestinal bleeding or at risk of such bleeding due to very low platelet counts. During the febrile phase, administration of intravenous fluids is usually not necessary, except for patients with severe vomiting or dehydration. Platelet counts and packed cell volume should be done daily beginning on the third day of fever, as the patient is likely to progress into the plasma leakage phase during this time. Platelet counts $<100 \times 10^9$/l and rises in packed cell volume of >20%, reflect significant plasma loss [43].

Since dengue fever is usually a mild self limiting disease, most patients can be managed at home. However, admission to hospital is needed if patients show any sinister features suchas bleeding, clinical deterioration with defervescence, changes in the level of consciousness, or laboratory evidence of DHF. Patients who cannot eat or drink due to weakness may also be admitted because of the risk of dehydration. Furthermore, those at high risk of developing severe DHF (age <1 year, overweight/obese, massive bleeding, changes in level of consciousness, presence of underlying disease, for example, heart disease, anaemia) should be monitored very carefully.

2.2.7.2 Management of DHF

According to the severity of clinical symptoms, DHF is divided into four grades. Adequate fluid administration, regular assessment of fluid and electrolyte balance, and monitoring for development of complications is vital. Vital signs should be monitored every 1–2 hours to detect early progression to shock. The packed cell volume should ideally be monitored every 4–6 hours (or at least twice a day if this is not possible). The rate of fluid administration depends on body weight and degree of plasma leakage. This rate should be adjusted by frequent assessment of vital signs, urine output, and packed cell volume. Liver enzymes should be measured, as acute liver failure and hepatic encephalopathy are known complications.

2.3 Mosquito vectors in dengue infections

Mosquitoes belonging to the genus aedes (Aedes aegypti, Aedes albopictus, and Aedes polynesiensis) play an important part in transmission of dengue. The primary and most important vector is A aegypti, but A albopictus and A polynesiensis may act as vectors depending on the geographic location. For instance, A albopictus has been found to sometimes transmit dengue in Thailand, Samui island, India, Singapore, and Mexico.

Aedes aegypti, a container breeding, day biting mosquito is found in tropical and subtropical areas .They rest indoors, mainly in living rooms and bedrooms. This maximizes man-vector contact and minimizes contact with insecticides sprayed out doors, hence contributing to difficulty in controlling this vector.

Aedes aegypti can breed in polluted water or small collections of water such as flower vases or coconut shells [44]. Eggs can survive for long periods, as they are capable of withstanding desiccation. Improper disposal of garbage or inadequate wastewater drainage facilitates, both consequences of unplanned urbanization, may be responsible for high mosquito densities in endemic areas.

Significant increases in the mosquito larval populations are seen during the rainy season. This may be a reason why epidemics of dengue tend to coincide with the rainy season[45]. Furthermore, ambient temperature and relative humidity affect viral propagation in mosquitoes; rates being highest in climates resembling the rainy season [46]. Environmental temperatures also affect the time to acute viraemia in female mosquitoes, being shorter with rises in temperature [47].

After biting an infected human, dengue viruses enter an adult female mosquito. The virus first replicates in the midgut, reaches the haemocoel and haemolymph, and then gains access to different tissues of the insect. After viral replication in the salivary glands, the infected mosquito can transmit the virus to another human. Ultra structural studies show viral particles within the nervous system, salivary glands, foregut, midgut, fat body, epidermal cells, ovary and internal body wall lining cells of the mosquito. In contrast, they are absent from muscle, the hindgut, and malphigian tubules.

Compared with uninfected mosquitoes, infected ones take longer to complete a blood meal. This may contribute to the efficiency of *A aegypti* as a dengue viral vector. This increased time corresponds to dengue virus infection of organs known to control or influence activities associated with feeding [48].

Several studies suggest the existence of transovarial dengue virus transmission in aedes infected female mosquitoes, allowing propagation of virus to their progeny. Such a process would allow it to act as a reservoir for virus maintenance during interepidemic periods (without human or other vertebral host participation) [49]. Reports also suggest that dengue viruses maybe transmitted sexually from the male to female mosquitoes, but not vice versa.

2.4 Prevention of mosquito bite

Since there is no effective vaccine against dengue, the prevention and control of dengue infections depends largely on preventing man-vector contact. Numerous

strategies have been adopted and include: environmental control, biological control, chemical control, and active case surveillance. While each of these methods have some effect, successful control programmed should incorporate all appropriate methods and also foster a strong partnership between the different dengue control agencies and the community. The dengue control programmed in the South East Asian and South Asian regions have been generally unsuccessful, largely because they have relied solely on insecticide spraying [2].

2.4.1 Environmental control methods

These include: reducing vector breeding sites, solid waste management, modification of man made breeding sites, and improvements in house design. Public education programmed plays a vital part if they are to be effective [50].

Personal protection is important in preventing man-vector contact. Sufficiently thick and loose fitting clothes reduce contact with the mosquitoes, but may not be the most practical clothes to wear in hot tropical climates. Other measures such as using household insecticidal products (mosquito mats and liquid vaporizers) or mosquito repellents may also be effective. Naturally occurring repellents (citronella oil, lemon grass) or chemical repellents (DEET) are available. However, unlike in the control of malaria, insecticide treated mosquito nets have limited utility in dengue control programmed as the vector is chiefly a day biting mosquito.

2.4.2 Biological control of the vector

Biological control methods are targeted against the larval stages of the dengue vector. They include the use of larvivorous fish such as Gambusia affinis and Poecilia reticulate, endotoxin producing bacteria (Bacillus thuringiensis serotype H-14 and Bacillus sphaericus are currently used), and copepod crustaceans. Bacillus thuringiensis serotype H-14 is more effective against A aegypti with very low levels of mammalian toxicity, and has therefore been accepted for use in household containers storing water [2]. The use of mesocyclops (a copepod crustacean) in the Northern Province of Vietnam led to the eradication of the vector in a many areas.[49] They are most suitable for use in large containers (wells or concrete tanks) that are not

cleaned regularly, as frequent cleaning leads to depletion of nutrients required by them. However, mainly due to their high cost, most of these methods have been restricted to small scale field operations.

2.4.3 Chemical control

This includes the application of larvicidal insecticides or space spraying. Space spraying is more widely used as larvicidal insecticides cost more. Insecticides used for treating containers that hold water includes Temephos 1% sand granules and insect growth regulators. Regular monitoring of resistance patterns is essential as resistance to Temephos has been reported among some Aedes mosquito species in the South East Asian Region. Insect growth regulators interfere with the development of the immature forms of the mosquito and have extremely low mammalian toxicity.

Space spraying may be applied as thermal fogs or as ultra low volume sprays. Although both methods are equally effective in killing adult mosquitoes, thermal fogging tends to be used more widely. Although insecticides such as malathion 4%, fenitrothion 1%, or pirimiphos-methyl have proved to be very effective in many control programmed, mosquito vectors develop different patterns of resistance to them [50-51].

Ultra low volume applied bifenthrin, which has both adulticidal and larvicidal activities, was originally shown to be more effective than thermal fogging in the control of dengue vectors. Subsequent contradictory reports suggest ultra low volume spraying have no effect on the oviposition of A aegypti mosquitoes, possibly because very low amounts of the aerosol reach the primary resting sites of the vector[52].

2.4.4 Vaccination

In the future, provided to the population at risk in potentially dengue areas, could be a promising measure. However, the tetravalent dengue vaccine is still in the process of research and development for mass production. With the help of this measure not only personal protection could be achieved but also further transmission prevention by reducing infective viral sources.

2.5 Theories related to the study

There are several factors that are associated to the preventive behavior. In this study of preventive behavior of family leaders in Ban Chang-lo was based on the concept of Green and Kreuter (1999). Throughout the concept emphasize two fundamental propositions :(1) health and health risks have multiple determinants and (2) because health and health risks are determined by multiple causes, efforts to effect behavioral, environmental, and social change must be multidimensional or multisectoral. The multidimensional nature of health promotion requires the kind of professional preparation and collaboration that can integrate several scientific and professional disciplines. The combination of various process and techniques are required to develop a plan and to determine strategies for health behavior changes. The Proceed model can give direction and focus to such attempts and contributing to an improvement in quality of life [53].

PRECEDE PROCEDE Framework consists of two parts as below.

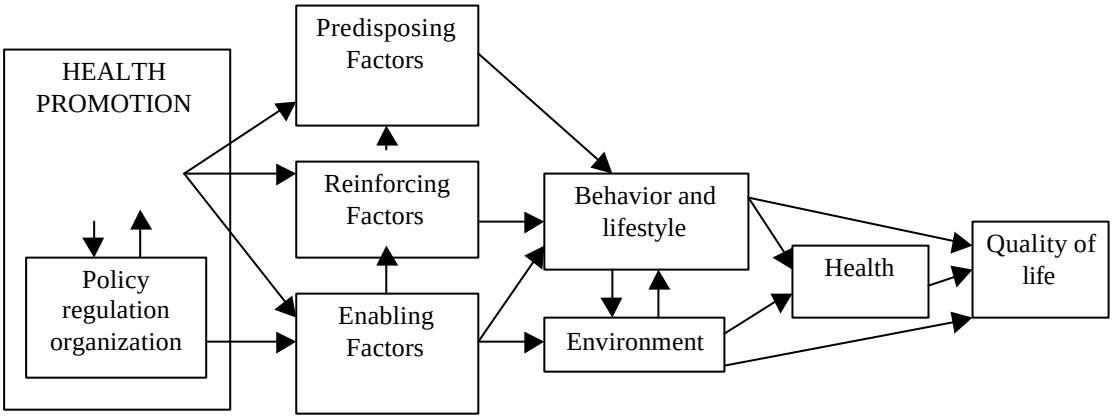
Part I **PRECEDE** (Predisposing, Reinforcing and Enabling Cause in Educational Diagnosis and Evaluation) means the utilization of predisposing, enabling and reinforcing factors for the diagnosis and evaluation of health education performance in order to change health behavior. This process is composed of five steps of analysis starting from current situation of health problems. The problems are then examined backward to identify the causes of the problems and the obtained data are utilized in the planning of further management for behavioral changes.

Part II **PROCEED** (Policy, Regulatory, Organizational, Constructs in Education and Environmental Development) is the development and implementation of plan. The PRECEDE part must be completed before the planning starts; it, then leads to implementation and evaluation in steps 6 to 9.

Details about each step of the PRECEDE- PROCEED framework are present below.

PRECEDE

Phase 5	Phases 4	Phase 3	Phases 2	Phases 1
Administrative and policy assessment	Educational and ecological assessment	Behavioral and environmental assessment	Epidemiological assessment	Social assessment



Phase 6	Phase 7	Phase 8	Phase 9
Implementation	Process evaluation	Impact evaluation	Outcome evaluation

Source: Green, L.W & Kreuter M.W, (1999). Health Promotion Planning: An educational and ecological approach 3rd edition. Toronto: Mayfield [53]

Figure 7 Diagram of THE PRECEDE PROCEED MODEL

Step 1 Social diagnosis is a process of considering and analyzing quality of life. It involves the assessment of problems in various population groups, judging which problems have impacts on an individual, group of people and their health. The assessed problems indicate levels of quality of life of the population; for example unemployment, crime, overpopulation.

Step 2 Epidemiology diagnosis is an analysis of health problems which affect the population being studied. The epidemiology diagnosis helps in specifying health problems, understanding the distribution of the problems and the risk factors related to the problems. The data are then utilized in determining the priority of the problems so that the more important ones can be selected for further management.

Step 3 Behavior and environmental diagnosis is the process of examining the environmental and behavioral components that are related to health conditions and health problems.

Step 4 Education and organization diagnosis is an examination of factors that cause or affect health behavior. The factors are categorized into predisposing, enabling and reinforcing factor.

Step 5 Administrative and policy diagnosis is associated with the assessment of capacity and resources of an organization, as well as its policy which leads to the management plan and the actions which should be consistent with the factors influencing health behavior found from step 4.

Step 6 Implementation is the utilization of the plan.

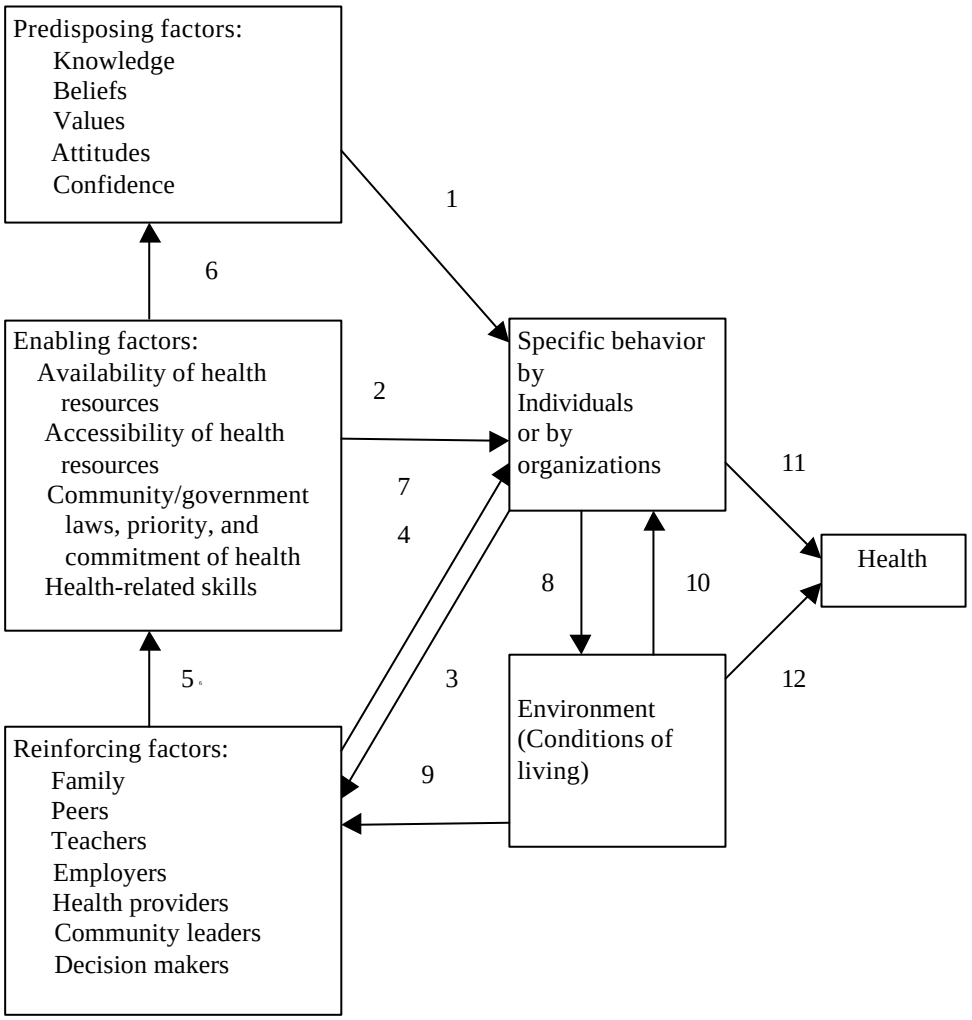
Step 7 Evaluation involves three aspects as follows:

Process evaluation is the evaluation of problems arising during the implementation as well as the evaluation of the progression of the program in order to assess and ensure that the program is progressed as planned.

Impact evaluation is the evaluation of unexpected impacts, both in positive and negative ways.

Outcome evaluation is the evaluation of the outcomes directly resulted from the program. This evaluation includes three issues: effectiveness, adequacy and efficiency.

This study only focus on **step 4 of PRECEDE- PROCEED** framework. It was examination of factors associated to preventive behavior on dengue hemorrhagic fever (figure 7) these factors are categorized into Predisposing, enabling, reinforcing factors as discussed below.



Source : Green, LW & Kreuter., M.W. (1999). Health Promotion Planning: An educational and ecological approach 3rd edition. Toronto: Mayfield .[53]

Figure 8 This portion of PRECEDE-PROCEED model includes additional lines and arrows to outlines a theory of causal relationships and order of causation for the three sets of factors influencing behavior.

1. Socio-demographic factors.

1.1 Age

Age is an intrinsic that creates differences between individuals, including differences concerning illness and health behavior [54] B.H.B. [55], conducted a study in knowledge and use of preventive measures related to dengue in northern Thailand and found that Younger people knew more about dengue than older persons.Rachanee, et al[56]. conducted a study of Factors Affecting dengue hemorrhagic fever control and preventive behaviors of people in Muang Suphanburi Municipality, Suphanburi and found that age and education level were related in the preventive behavior on acute dengue hemorrhagic fever ($p < 0.05$).

1.2 Education Level

Education is the creating, gathering and transferal of knowledge, experience and culture of human beings. It is progressing of person to develop knowledge and skill as abilities in various aspects; for example, attitude, moral principle and behavior [57]. People with high education level have more chance to learn about diseases and health care than those with low education level (Timmreck, 1998: 325) [54].

1.3 Family income

Huff & Kline studied and found that income is associated with wealth and an important factor that can determine health condition of an individual [57]. Income is an essential component influencing individual's ability in health care. People with high incomes have better opportunities in seeking for health promoting facilities including appropriate health service and communication with various social groups enhance their knowledge and experience concerning health, compared to those with low incomes [58].. Rachnee et al [56]. Conducted a study of factors affecting dengue hemorrhagic fever control and preventive behavior of people in Muang Suphanburi Municipality, Suphanburi and found that adequate in come of the family was related to the practice of preventive behavior of the family.

2. Predisposing Factors

Predisposing factors are an intrinsic factors existing in an individual which may support or inhibit a performance of certain behavior. The factors may have influence on the performance of preventive behavior on dengue hemorrhagic fever by motivating or satisfying an individual. Predisposing factors are composed of. Knowledge and attitude in associated to the preventive behavior of dengue hemorrhagic fever among family leaders.

2.1 Knowledge

Mean the facts and understanding of these facts will help people to do their jobs completely. Also people like to have knowledge and people like to understand the world they live in and to have reasons for the things which they do.
Therefore, it is necessary to give the information about DF/DHF cause of infection, Mode of transmission, what kind of mosquito that leading to infected of DF/DHF? And give them the information about how to prevent and control of the disease and to inform people in the community to detect mild and severe clinical features of disease. The community may gained their, knowledge about DF/DHF through information from media, print media, health center officer.

Swaddiwudhipong W, Lerdluknavonge 1992 [60]. Surveyed the DHF knowledge of people among 417 households in Mae Sord District, Tak Province. It was found that people had low proportion of knowledge regarding eliminating Aedes larva in ant-trap (18%) and cement baths (17%).

Klinubol S. 1999 [59]. Factors affecting dengue hemorrhagic fever prevention behavior of student in primary school of Phetchaburi Province. Conducted a survey among 400 grade 6 students in Phetchaburi Province It was found that knowledge of DHF was associated with DHF prevention behavior.

N. Khantikul et al, 2001[55]. Knowledge and use of prevention measures related to dengue in northern Thailand. May 2001 they are conducted an epidemiological survey among 1650 persons living in three areas in the northern Thailand. Knowledge of dengue and the use of prevention measures by means of a structured questionnaire. Results of the 1650 persons, 67% had knowledge of dengue. Persons with knowledge of dengue reported a significant higher use of prevention measures than persons without knowledge of dengue. In multivariate analyses, knowledge of dengue significantly differed by age, sex, occupation and site ($p<0.05$).

2.2 Attitude

Mucchielli describes attitudes as a tendency of mind or of relatively constant feeling toward a certain category of objects, persons, or situations. Kirscht viewed attitudes as a collection of beliefs that always includes an evaluative aspect. Attitude and beliefs are frequently confused. According to Fishbein(1980) [61]. The term attitude should be used for a person's judgement of a behavior as good or bad and worth carrying out.

K. prapas (2538:58-59) [62]. The study of knowledge attitude and practice in prevention on dengue hemorrhagic fever among village health volunteers. Found that most of village health volunteer have moderate level of attitude about 63.81 percents.

3. Enabling factors

3.1 Resources for the prevention of acute dengue hemorrhagic fever

Resources are associated with health care and evolved an individual to conduct health behavior (WHO, 1988: 12 Orem, et al., 2001: 246). The availability of resources for prevention of acute dengue hemorrhagic fever comprising of mosquito nets or mosquito screens, water containers and abate sand, will enable people to prevent acute dengue hemorrhagic fever, as well as the capability of family to obtain the resources and supplied from concerning organizations. There should be support in obtaining these resources and the compensation or replacement should be available

when some resources are finished or damaged. A study conducted by Makemog, S. 1999 [63]. Found that sufficiency of resources for the prevention of acute dengue hemorrhagic fever has relationship with behavior in prevention of acute dengue hemorrhagic fever of school-aged children in Burirum Province. A study conducted by Likmkamsook, W. [64]. Demonstrated that the use of damaged mosquito nets has positive relationship with the illness with acute dengue hemorrhagic fever as the use of damaged mosquito nets leads to the highest risk of mosquito bites as there is no prevention at the targeted person.

4. Reinforcing factors

Reinforcing factors means the encouragement or support from surrounding people who have influence on individuals that lead to those individual to perform behavior with an expectation of something in return. It can be positive or negative reinforcement. Somsak Buddraj [65]. Conducted the study of prevention and control of aedes mosquito in small community by using grade 6 students in community, using abate sand with blanket mass treatment with the supervision of school teachers and public health officers and found that the students can cover with abate sand in 90-95% of household and follow up within 6 weeks found that the prevalence of mosquito and mosquito larvae were decreased significantly (p-value <0.05).

5. Health Preventive behavior of DHF

Harris and Guten [17] have given the meaning of behavior in terms of disease control by referring the " Health Preventive Behavior" which meant that any action take place by the person is often and always in order to prevent the disease. Majority of the people generally take actions or behaves with the objective of having good health and such could include sleeping, physical activities, personal health habits or self protection from the disease.

Suwan [66] has given the meaning of health behavior as the behavior related to disease control and includes both behaviors selected to be inline with trustworthiness'

or medical codes together with behavior based on mother's beliefs which might be inline and contradict with the trustworthiness or medical code.

The action or behavior of people, which can to prevent dengue virus being transmitted Aedes to the body is by protecting themselves through the control mosquito breeding places, larva and adult mosquitoes. Personal preventive behavior of DHF refers to the behavior or action of people takes to prevent themselves and their family from being bitten by Aedes aegypti. This is mostly by sleeping in bed nets or the screening room, use of insecticide and use of other chemical substance.

In this study, DHF preventive behavior means behavior of family leaders for protecting themselves or their family not to be infected with DHF.

6. Reviews of relevant research finding.

Y. wannapa [67]. The study of Factors influencing the incidence of Dengue Haemorrhagic Fever in Chiengmai Province. Conducted a comparative study of 220 households from high incidence area and 320 households from low incidence area. The result indicate that having received DHF in formations from public health staffs, the satisfaction with community leaders' operation and the intention of operation on DHF prevention of the community members in the areas with high incidence of DHF and low one were not statistically significant different. Whereas, their perception on susceptibility and severity of DHF and on benefit of operation following public health staffs' were significant different in the high incidence group.($p<0.001$)

Swaddiwudhipong W, Lerdluknavonge [60]. Surveyed the DHF knowledge of people among 417 households in Mae Sord District,Tak Province. It was found that people had low proportion of knowledge regarding eliminating Aedes larva in ant-trap (18%) and cement baths (17%).

C. sawangjai [68]. The study of environment health behavior and the knowledge regarding dengue heaemorrhagic fever among the rural housewife's.

Conducted 325 housewifes in Numkaum Subdistrict, Thadpanom District, Nakhon Phanom Province. Indicated that the practice of rural housewifes on the prevention of DHF was mainly at moderate level. This was probably due to the fact that the housewifes had moderate level of knowledge and understanding in DHF epidemiology. Further analysis of data regarding the household environment sanitation revealed that approximately one-third of rural households still had poor or unhygienically practiced of environment sanitation, particularly the draining of domestic sewage.

Klinubol S. [59]. Factors affecting dengue hemorrhagic fever prevention behavior of student in primary school of Phetchaburi Province. Conducted a survey among 400 grade 6 students in Phetchaburi Province. It was found that knowledge of DHF was associated with DHF prevention behavior.

N. Khantikul et al, [55]. Knowledge and use of prevention measures related to dengue in northern Thailand. May 2001 they are conducted an epidemiological survey among 1650 persons living in three areas in northern Thailand. Knowledge of dengue and the use of prevention measures by means of a structured questionnaire. Results of the 1650 persons, 67% had knowledge of dengue. Persons with knowledge of dengue reported a significant higher use of prevention measures than persons without knowledge of dengue. In multivariate analyses, knowledge of dengue significantly differed by age, sex, occupation and site ($p<0.05$).

Q. phan [69]. The study of preventive practice for dengue and dengue hemorrhagic fever and its correlating factors of phong dien townlet residents Thua thien Hue Province, Vietnam. Conducted 229 residents in Phong dien townlet revealed that more than half of the residents (56.8%) had high practice scores of DF/DHF prevention. There were 64.2% of residents who had high knowledge scores, less than 45% had high attitude scores towards DF/DHF preventive practice. There was a significant association between the residents' preventive practice and knowledge, attitude, residents' participation and their support sources and occupational groups.

P. rachanee [56]. The study of factors affecting dengue hemorrhagic fever control and preventive behavior of people in Muang Suphabiri Municipality, Suphanburi Province. Conducted 430 people who were family leaders. Revealed that there were 7 variables related to dengue hemorrhagic fever control and preventive behaviors: age, education, environment around house, knowledge of dengue hemorrhagic fever, perceived of dengue hemorrhagic fever, reinforcing and enabling factors. All seven variables were positively related to control and prevention behavior of dengue hemorrhagic fever. There were 5 variables positively related to dengue hemorrhagic fever control and prevention behaviors: enabling factors, reinforcing factors, reinforcing factors, education, knowledge of dengue hemorrhagic fever and adequate income. Forecasting capacity of control and prevention behavior I. 43 percents.

CHAPTER 3
RESEARCH METHODOLOGY

3.1 Study design

The study design is cross-sectional study with descriptive and analytic components. Gathering the data of socio-demographic, predisposing factors, enabling factors and reinforcing factors in Ban Chang-lo, Sub-district communities, Bangkok-noi district, Bangkok.

3.2 Selective of study area

Ban Chang-lo community is selected because it has most cases of dengue hemorrhagic fever among Bangkok-noi district

Regarding to dengue hemorrhagic fever, during 1999 to 2003 there were 218 cases are reported.

3.2.1 Descriptive of the selected community.

There are 44,453 populations, 10,068 households, 38 Health volunteers and 14 health-posts. Mostly are slum communities and those communes are working as employee, low economic status.

3.3 Sample size

The sample size of the study is estimated which the result 414 of sample size. The population of this study is not based of total population of people in the communities. Using this formula:

$$n = \frac{z^2_{a/2} p(1-p)}{d^2}$$

Where

n = Number of family leaders to be investigated

Z at 0.05 (critical region), 1.96

p = 0.43 (proportion of family leaders with positive DHF prevention practice. According to the study conducted by Rachanee in Muang Suphanburi Municipality, Suphanburi (2002), Interviewing 430 people who was family health leaders and the proportion of family health leaders with forecasting capacity of control and prevention behavior is 43%).[18]

q = 1-p = 0.57

d = degree of accuracy (0.05)

$$n = \frac{1.96^2 (0.43)(1-0.43)}{0.05^2}$$

$$n = \frac{3.8416(0.43)(1-0.43)}{0.05^2}$$

n = 376

The sample size calculated was 376 family leaders.10% more than the theoretical sample size were collected in case some data was missed. Therefore, 414 cases were collected.

3.3 Sampling technique

The researcher, accompanied by family nurses and health staff members of Wat chau-arm Public Health Center, collected the data as muti-stage sampling. The procedure included the following steps:

Step 1: One Sub-district from 5 Sub-districts in Bangkok-noi District, Bangkok Province was selected. (Purposive sampling)

Step 2: Selected 14 communes in Ban Chang-Lo sub-district to study. (Finite population)

Step 3: Get the proportion of family leaders of each commune per total number of family leaders in Ban Chang-Lo Sub-district by this formula.

Proportion of family leaders in each commune

$$= \frac{\text{Number of family leader in each commune}}{\text{Total number of family leader in Ban Chang-Lo}}$$

Wat Amorntayaikaram	=	176 / 10068	=	0.017
Trog Khao Mao	=	450 / 10068	=	0.044
Sudsakorn	=	700 / 10068	=	0.069
Pornpipat	=	400 / 10068	=	0.039
Kehaechmchon	=	192 / 10068	=	0.019
Wat Dongmoonlek	=	700 / 10068	=	0.069
Nuer Wat Singhagrisorn	=	150 / 10068	=	0.014
Soi Ban Chang Lo	=	125 / 10068	=	0.012
Wat Yang	=	900 / 10068	=	0.089
Sai Tai Kao	=	300 / 10068	=	0.029
Wat Ampawa	=	800 / 10068	=	0.079
Wat Po Reing	=	4500 / 10068	=	0.446
Wat Krut	=	450 / 10068	=	0.044
Wat Praya Tam	=	245 / 10068	=	0.024

Next to calculate the sampling in each commune by using sample size that was calculated before multiply by sample size for proportion allocation as following:

Wat Amorntayaikaram	=	0.017x376	=	7.04 = 7
Trog Khao Mao	=	0.044x376	=	18.48 = 18
Sudsakorn	=	0.069x376	=	28.56 = 29
Pornpipat	=	0.039x376	=	16.15 = 16
Kehaechmchon	=	0.019x376	=	7.87 = 8
Wat Dongmoonlek	=	0.069x376	=	28.56= 29
Nuer Wat Singhagrisorn	=	0.014x376	=	5.80 = 6
Soi Ban Chang Lo	=	0.012x376	=	4.90= 5
Wat Yang	=	0.089x376	=	36.80 = 37
Sai Tai Kao	=	0.029x376	=	12.00= 12
Wat Ampawa	=	0.079x376	=	32.70 = 33
Wat Po Reing	=	0.446x376	=	184.68 = 185
Wat Krut	=	0.044x376	=	18.21 = 18
Wat Praya Tam	=	0.024x376	=	9.93 = 10

Step 4: Used data record from family folder of Wat chaua-aum Public Health Center to select the house-hold alternately in every 25 households were selected. (List frame)

Step 5: Investigate every selected house-holds. If the selected family leader is not in the house, selected next door to the selected house.

Number of family leaders in Ban Chang-lo Sub-District and family leader sampling

No.	Name of Commune	No. of Household	No. of Sample size
1	Wat Amorntayikaram	176	7
2	Trog Khao Mao	450	18
3	Sudsakorn	700	29
4	Pornpipat	400	16
5	Kehachumchon	192	8
6	Wat Dongmoonlek	700	29
7	Nuer Wat Singhagrisorn	150	6
8	Soi. Ban Chang Lor	125	5
9	Wat Yang	900	37
10	Sai Tai Kao	300	12
11	Wat Ampawa	800	33
12	Wat Po Rieng	4500	185
13	Wat Krut	450	18
14	Wat Praya Tam	245	10
Total		**10,068**	**414**

3.5 Research instrument and measurement

This instrumentation consists of seven parts as detailed below.

Part I Socio- demographic characteristic: sex, age of family leaders, marital status, religion, family income, occupation, education of the family leaders

Part II Knowledge

The knowledge about DHF was composed of sign and symptoms, cause, mode of transmission, treatment and preventive of DHF. There were 12 questions. If family leaders select correctly they got 1 score. The score was varied from 0 to 12 scores and were classified into 3 levels as follow: (Bloom's cut off point for knowledge, 60-80%) [70].

- high level (>80 percent)
- moderate level (61-79 percent)
- low level (0-60 percent)

Part III Questionnaires related to attitude on preventive behavior of DHF

The attitude toward DHF was composed of 12 items which are related to the attitude on preventive behavior of family leaders in Ban chang-lo on dengue hemporrhagic fever. The rating scale measurement by Likert as 5 rating scales as follows.

Positive statement		**Negative statement**	
Choice	score(s)	Choice	score(s)
Strongly agree	5	strongly agree	1
Agree	4	Agree	2
Undecided	3	Undecided	3
Disagree	2	Disagree	4
Strongly disagree	1	strongly disagree	5

The scores of all variables were summed up, and the mean and standard deviation would be calculated. Categorized the variable into two levels as "POSITIVE' and 'NEGATIVE.' This part has 12 items, minimum score: 12 and maximum score: 60. Negative questionnaires are 1, 5, 7, 11, and 12 while positive questionnaires are 2, 3, 4, 6, 8, 9, and 10.

Part IV Questionnaires related to Prevention behavior of DHF

The preventive behaviors toward dengue hemorrhagic fever among family leaders during last 6 months ago and using 10 questions and 15 sub-questions. The measurement scales used was

High risk behavior $=> \bar{x} + 1SD$

Risk behavior $= \bar{x} + 1SD$

Low risk behavior $=< \bar{x}$ - 1SD

Sum up the total scores of risk from 10 questions, the highest scores of risk is 20 scores, then categorized into 3 level of risk and grouping of total amount of sample from 414 samples.

Part V Questionnaires related to adequate resources for prevention dengue hemorrhagic fever.

The questionnaire was a measurement of adequate resources for preventive of dengue hemorrhagic fever. It consist of 10 items about the following resources: 1. mosquito net/mosquito screening (3 items) 2. Covers for water containers (4 items). 3. Abate sand (3 items)

Scoring as:

Sufficiency (yes) = 1 score

Insufficiency (No) = 0 score

Sufficiency means answer yes in each item.

Part VI Questionnaires related to the information of the family leaders to the media in prevention of DHF composing of 2 portions.

Portion 1. The questionnaires about the information that related to the disease and prevents control of dengue hemorrhagic fever from other kinds of media except health officers. The rating scale has 3 choices select only one as follow:

Choice	score(s)
More than 1 time	2
Only 1 time	1
Never	0

There are 8 items total scores are 0-16 scores. Divided into 3 levels as

High level	$> \bar{x} + 1$ S.D
Moderate level	$= \bar{x} \pm 1$ S.D.
Low level	$< \bar{x} - 1$ S.D.

Portion 2. Questionnaires related to the sources of information that receive about the disease and prevention control of dengue hemorrhagic fever. Can be selected more than one answer.

Part VII Questionnaires related to supporting and supervision from health officers

The level of advice from health officer composed of 6 items, the rating scale has 3 choices as

Choice	score(s)
More than 1 time	2
One time	1
Never	0

The total score varied from 0-14 scores and are classified into 3 level as

High level	$> \bar{x} + 1$ S.D
Moderate level	$= \bar{x} \pm 1$ S.D.
Low level	$< \bar{x} - 1$ S.D.

3.6 Validity and Reliability

The questionnaires were made by the study of reviewed literature, previous study about dengue hemorrhagic fever, corrected by advisors and expert about content validity then examined the validity by the 3 panel of experts consisting of one pediatrician and two family nurses from public health center. After the revision according to suggestion and comment from the panel of experts and advisors. The questionnaire was conducted to 30 families' leaders in Bang khunsri sub-district. Regarding to the knowledge and attitude related questionnaire. The reliability is checked by using Cronbach's alpha coefficient and the result was 0.7 in both knowledge and attitude.

3.7 Data analysis

The data would be analyzed. The test of variable association was significant at level of 0.05 and analysis the data by following.

1. Demographic data of the sample such as age, education, family income and data about resources for the prevention of dengue hemorrhagic fever were analyzed with frequency and percentage.

2. Mean and standard deviation were calculated from the total scores obtained from the questionnaire of knowledge, attitude, resources for prevention of dengue hemorrhagic fever.

3. Pearson's Product Moment Correlation Coefficient and Chi-square test were calculated to find the association between knowledge, attitude, resources for prevention of dengue hemorrhagic fever, information about dengue hemorrhagic fever from the media, the supporting, supervision from the health officer and preventive behavior's risk on dengue hemorrhagic fever among family leaders.

CHAPTER 4
RESULTS

The results from the data analysis will be illustrated in 3 parts of follows:

Part I : Descriptive statistics of demographic data of family leaders.

Part II : Descriptive statistic for preventive behaviors of family leaders on dengue hemorrhagic fever.

Part III : Association between socio-demographic, predisposing factors, enabling factors and reinforcing factors of family leaders on dengue hemorrhagic fever.

Part I : Demographic data of family leaders

1.1 Demographic data from table 2 as following:

Gender: family leaders in the sample group were 414 persons divided into sex as male and female. We had female more than male as female 270 persons (65.2%) and male 144(34.8).

Age: From the data we found that most of family leaders were in age group of more than or equal to 50 years old (32.9 %) and followed by age between 45-49 years old (16.4 %).

Marital status: Most of the family leaders were married and live together about 240(58%) followed by single as 67(16.2%).

Religion: Most of family leaders were Buddhism about 408 persons (98.6%) the rest were very few in Muslim and others.

Family income: The average of family income were about more than or equal to 7,001 baht per month (49%) and followed by 5,001-7,000 bath per month (24.9%).

Occupation: Most of family leaders were employees about 148(35.7%) followed by housewife and husband about 129(31.2%) and others (merchant, working at home etc).

Education: Most of family leaders were educated at the primary school level about 149(36 %) followed by secondary school level about 88(21.3%) and high school level about 83(20.0%).

Part I: Descriptive statistics of demographic data of family leaders.

Table 4 Number and percentage of family leaders categorized by demographic characteristic. (n = 414)

Demographic characteristic	Number	Percentage
Gender		
Male	144	34.8
Female	270	65.2
Age group		
24	29	7.0
25-29	42	10.1
30-34	39	9.4
35-39	55	13.3
40-44	45	10.9
45-49	68	16.4
50	136	32.9
Marital status		
Single	67	16.2
Married/live together	240	58.0
Married/separate	54	13.0
Widow/divorce	53	12.8

Table 4 Number and percentage of family leaders categorized by demographic characteristic. (cont.)

Demographic characteristic	Number (n =414)	Percentage (100.0)
Religion		
Buddhism	408	98.5
Muslim	4	1.0
Others	2	0.5
Income (Baht/month)		
3,000	34	8.2
3,001-5,000	74	17.9
5,001-7,000	103	24.9
7,000	203	49.0
Occupation		
Unemployed	25	6.0
Housewife/Husband	129	31.2
Government officers	33	8.0
Employee	148	35.7
Labor	5	1.2
Others	74	17.9
Education		
Illiteracy	9	2.2
Primary school grade 1-6	149	36.0
Secondary school	88	21.3
High school	83	20.0
Diploma	32	7.7
Bachelor degree or equal	39	9.4
More than bachelor degree	14	3.4

Part II. Data about the variables in predisposing, enabling, reinforcing and preventive behavior in prevention of dengue hemorrhagic fever.

2.1 Data about the variables in this study are divided into predisposing enabling and reinforcing factors as following.

Predisposing factors; composed of knowledge and attitude to the preventive behavior on dengue hemorrhagic fever as following.

2.1.1 Knowledge about the disease, prevention and control of dengue hemorrhagic fever.

From this study we found that the family leaders mostly they had the level of knowledge about the dengue hemorrhagic fever and prevention of the disease in the level of moderate to high level. Most of the knowledge at high level about 82.1 percentage follow with moderate level about 13.8 percentage and very few as 4.1 percentage as low level. The average of the knowledge was equal to 10.5 scores the standard deviation about 1.405, the minimum scores as 3, and maximum scores as 12 (Table: 3)

Table 5 Number and Percentage of family leader's knowledge about dengue hemorrhagic fever.

Level of knowledge	**Number (n = 414)**	**Percentage (100.0)**
High (10-12 scores)	340	82.1
Moderate (7-9 scores)	57	13.8
Low (0-6 scores)	17	4.1
$\bar{x}$ = 10.4783	**SD**. = 1.405 **Min** = 3	**Max** = 12

When we consider in each item of the knowledge found that most of them had knowledge in the following as 97.3 percentages known that weekly cleaning the container can reduce the number of mosquito(item 11), 97.1 percentages known that

Aedes agypti mosquito is the vector for dengue hemorrhagic fever(item 1), 96.6 percentage known that storage water in bathroom and flower vase are the breeding place for day bite mosquito(item 9), 95.7 percentages known that infected dengue hemorrhagic fever patients can cause of death(item 7), 94.0 percentages known that larvivorous fishes can prevent dengue hemorrhagic fever by eating mosquito papule and larvae 91.8 percentages known that sleeping in the mosquito net/mosquito screening all the time can prevent dengue hemorrhagic fever(item 10), 91.3 percentages known that abrupt high grade of fever and with myalgia and petechiae are indicated for dengue hemorrhagic fever(item 5), 91.1 percentages known that day bite mosquito are causing dengue hemorrhagic fever(item 2), 88.9 percentages known that that children are more risk for dengue hemorrhagic fever infected patients than adults. (item4), 88.2 percentages known that all season in Thailand can cause dengue hemorrhagic fever but rainy season is the most epidemic season.(item 3), And from the study we can see that some of the sample that mis- understood about some treatment and prevention in dengue hemorrhagic fever as 65.0 percentages known that when you have fever and suspected for dengue hemorrhagic fever paracetamol is the drug of choice.(item 6), 50.7 percentages known that vaccinization can prevent for dengue hemorrhagic fever(item 8) and nearby 50 percentages that they do not know about the paracetamol can take during the fever and suspected for dengue hemorrhagic fever beside that still there are some unknown about vaccinzation can prevent the dengue hemorrhagic fever as the other kind of infection. (49.3%) (Table 6)

Table 6 Number and percentage of family leaders by the level of knowledge about dengue hemorrhagic fever per each item. (n = 414)

Knowledge about DHF	known		unknown	
	Number	%	Number	%
1. Aedes agypti mosquito is the vector for DHF	402	97.1	12	2.9
2. Day bite mosquito are causing DHF	378	91.1	36	8.7
3. All season in Thailand can causes DHF But rainy season is the most epidemic season.	365	88.2	49	11.8
4. children are more risk for DHF infected patients than adults	368	88.9	46	11.1
5. Abrupt high grade fever and with myalgia and petechiae are indicated for DHF.	378	91.3	36	8.7
6. when you have fever and suspected for DHF paracetamol is the drug of choice.	269	65.0	145	35.0
7. Infected DHF patients can cause of death.	396	95.7	18	4.3
8. Vaccinization can prevent for DHF.	210	50.7	204	49.3
9. Storage water in bathroom and flower vase are the breeding place for day bit mosquito.	400	96.6	14	3.4
10.sleeping in the mosquito net/ screen all the time can prevent DHF.	380	91.8	34	8.2
11.Weekly cleaning the container can reduce the number of mosquito larvae.	403	97.3	11	2.7
12.Larvivorous fishes can prevent DHF by eating mosquito papule and larvae.	389	94.0	25	6.0

2.2.2 Attitude to the disease and prevention and control of dengue hemorrhagic fever.

Most of the samples had moderate level of attitude in preventive and control of dengue hemorrhagic fever about 73.2 percentages follow good level of attitude and low attitude level about 17.1 and 9.7 as following. With the average scores of 43.3 scores standard deviation about 5.033 minimum scores 23 and maximum scores 55. (Table7)

Table 7 Number and percentage of the family leaders by the level of attitude in preventive and control of DHF.

Level of attitude	**Number**	**Percentage**
Good (> 48 scores)	71	17.1
Moderate (38-45 scores)	303	73.2
Low (0-37 scores)	40	9.7
Total	414	100.0

$\bar{x}$ = 43.3 **SD** = 5.033 **Min** = 23 **Max** = 55

When we consider in each item of the attitude most of the family leaders they answered in good level of attitude (means answer agree in the statement positive and answer not agree in the statement of negative) in following item as 58.2 percentages larvivorous and gubby fishes were the easy way to get rid of mosquito larvae(item 10), 57.5 percentages standstill water in ant trap and flower vase were important breeding site for mosquito.(item 9), 54.1 percentages advantage of tight cover container will prevent mosquito laying egg. For those family leaders that had not so correct attitude such as the statement about dengue hemorrhagic fever is the preventable disease without difficulty 27.1 percentages (item 1), 17.4 percentage no need to get rid of the mosquito breeding place in family who's never infected (item 3), 15.5 percentages weekly clean up all container are very difficult to do. (Table 8)

Table 8 Number and percentage of family leaders by the attitude in each item. (n = 414)

Statement	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree	$\bar{x}$	SD
1. Dengue hemorrhagic fever is the preventable disease without difficulty.	27.0 (112)	56.8 (235)	8.7 (36)	6.5 (27)	1.0 (4)	1.98	0.840
2. You are one of important persons in prevention and control of DHF	0.0	2.4 (10)	9.7 (40)	51.2 (212)	36.7 (152)	4.22	0.716
3. No need to get rid of the mosquito breeding place in family who's never infected	17.4 (72)	49.8 (206)	11.6 (48)	13.8 (57)	7.5 (31)	2.44	1.150
4. You are willing to join the campaign in getting rid of the mosquito breeding place.	1.4 (6)	2.9 (12)	4.6 (19)	48.6 (201)	42.5 (176)	4.28	0.801
5. Infected with DHF as normal as common cold.	9.9 (41)	9.7 (40)	9.2 (38)	47.6 (197)	23.7 (98)	3.65	1.221
6. Finding and getting rid of the mosquito breeding place are all duty.	4.6 (19)	5.8 (24)	3.6 (15)	47.6 (197)	38.4 (159)	4.09	1.029
7. Weekly clean up all containers are very difficult to do.	15.5 (64)	18.8 (78)	8.7 (36)	43.0 (178)	14.0 (58)	3.21	1.325
8. Advantage of tight cover will prevent mosquito laying egg.	1.9 (8)	1.9 (8)	6.5 (27)	54.1 (224)	35.5 (147)	4.19	0.797
9. Standstill water in ant-trap& flower vase is important breeding sites for mosquito.	1.2 (5)	2.4 (10)	6.3 (26)	57.5 (238)	32.6 (135)	4.18	0.751
10. Larvivorous and gubby fish are the easy way to get rid of mosquito laevae.	0.7 (3)	2.4 (10)	7.5 (31)	58.2 (241)	31.2 (129)	4.17	0.722
11. Only smogging is enough to prevent mosquito, no need for others way.	7.7 (32)	12.3 (51)	14.3 (59)	47.1 (195)	18.6 (77)	3.57	1.154
12. No need to sleep insides mosquito net because it is uncomfortable.	8.5 (35)	21.5 (89)	10.4 (43)	45.2 (187)	14.5 (60)	3.36	1.208

Enabling factor composed of adequate resources for the prevention on dengue hemorrhagic fever

2.1.3 adequate resources for prevention on dengue hemorrhagic fever

Found that most of the family leaders had enough resources in prevention of dengue hemorrhagic fever.

When consider in each of the item of the resources found that 86.7 percentages which had enough of mosquito net and screen. For the cover of water container found that most of the family leaders had not enough about the cover of water container about 68.6 percentages and for abate sand they had not enough too about 71.0 percentages. (Table 9)

Table 9 Number and percentage of family leaders by the level of adequate resources for prevention and control dengue hemorrhagic fever.

Type of resources		Number	Percentage
Mosquito net/screen	enough	359	86.7
	Not enough	55	13.3
Cover	enough	284	31.4
	Not enough	130	68.6
Abate sand	enough	294	29.0
	Not enough	120	71.0

Reinforcing factors compose of the information of dengue hemorrhagic fever from the media, the supporting and supervision from the health officers

2.1.4 The information and sources for receiving of the media about prevention and control of dengue hemorrhagic fever.

Most of the family leaders received the information in the high level of 52.9 percentage follow by moderate and low level as 37.4 and 9.7 percentages in order. The average scores were 13.74 scores the standard deviation as 2.87 minimum score as 0 and the maximum scores as 16 scores. (Table 10)

Table 10 Number and percentage of family leaders by reinforcing factors

Reinforcing factors		Number	percentage
Receiving information from media			
High (15-16 scores)		219	52.9
Moderate (9-14 scores)		155	37.4
Low (0-8 scores)		40	9.7
$\bar{x}$ = 13.74	SD = 2.87	Min = 0	Max = 16
Advice and supervision from health officers			
High (9-12 scores)		319	77.0
Moderate (6-8 scores)		19	4.6
Low (0-6 scores)		76	18.4
$\bar{x}$ = 10.09	SD = 1.8	Min = 0	Max = 12

When we consider in each item of the informations , we found that the family leaders had received the information mostly(including those who received one time or more than one time) in about prevention mosquito bite was the best way to prevent dengue hemorrhagic fever(item 3) and to elimination breeding places in community will decrease in dengue hemorrhagic fever(item 4) and advise that dengue hemorrhagic fever caused by Aedes mosquito(item 1) as 79.2, 77.8, 76.3 in order. While those who received very few about sleeping in mosquito net and screen can prevent dengue hemorrhagic fever (item 6). (Table 11)

Table 11 Percentage mean and standard deviation by each item of advice and supervision from the health officer in the prevention and control of dengue hemorrhagic fever.

Advice and supervision from health officers	more than one time %	one time %	never %	$\bar{x}$	SD
1. Inform about DHF cause by Aedes mosquito.	76.3	20.3	3.4	1.73	.555
2. Inform by health officer, DHF even ever infected, having chance to infect again	72.5	19.8	7.7	1.65	.620
3. Prevention of mosquito bite is the best way to prevent DHF	79.2	17.9	2.9	1.76	.489
4. Inform, get rid off breeding places in community at the same time will decrease in DHF.	77.8	18.4	3.9	1.74	.520
5. Fever with myalgia, paracetamol is drug of choice.	62.6	22.9	14.5	1.48	.735
6. Inform, sleeping in the mosquito net/screening can prevent DHF	7.8	18.1	4.1	1.74	.526

2.1.5 Supervision from the public health officers in disease and prevention on dengue hemorrhagic fever.

Most of the family leaders had received an advice and supervision from the health officers in the level of high scores as 77.1 percentages and moderate to low scores as 4.6 and 18.4 percentages in order. With the mean scores at10.1 scores standard deviation as 1.8 minimum scores as 0 and Maximum scores as 12 scores. (Table 6).

2.1.6 Type of sources of the information that the family leaders received about the disease and prevention of dengue hemorrhagic fever

To know about the sources of information of the family leaders which received of information the family leaders can select more than one source. We found that most of the family leaders received the informations about the disease and prevention of dengue hemorrhagic fever from Television(90.6%) follow by announcement from the public health center about 83.3 percentages and some from Health volunteers about 82.4 percentages. While the less received the information from brochures, health line in the community. (Table 12).

Table 12 Number and percentage of media in prevention and control of dengue hemorrhagic fever.

Media	Number (n = 414)			
	Never	percentage	Sometime	percentage
Television	39	9.4	375	90.6
Radio	99	23.9	315	76.1
Health line	109	26.3	305	73.7
Announcement	69	16.7	345	83.3
Volunteer	73	17.6	341	82.4
Newspaper	94	22.7	320	77.3
Brochures	97	23.4	317	77.6
Others	160	38.6	254	61.4

2.2 Preventive behavior on dengue hemorrhagic fever among family leaders.

From the study there were 10 numbers of the preventive behavior questions and 15 subsets of the question that related to the behavior risk of the family leaders, we calculated as the behavior risk into 3 groups as no risk, moderate risk, high risk (table 13).

Table 13 Number and percentage of risk group

Risk group	**Number**	**percentage**
High risk (7-12 scores)	61	14.7
Moderate risk (3-6 scores)	270	65.2
Low risk (0-2 scores)	83	20.1
$\bar{x}$ = 4.26 **SD**. = 2.11	**Min** = 0	**Max** = 12

From the study we found that most of the family leaders had moderate risk in prevention of dengue hemorrhagic fever at the level of 65 percentage and follow with low risk at 20.0 percentages and 14.7 percentages as high risk.

The study shown that in each item of risk in the item of campaign in the community had risk at 45.1 percentages follow with the risk of using the mosquito insecticide and smog in the community during an outbreak of dengue hemorrhagic fever as 42.9 and 44.8 percentages in order. The others like container, flower vase, plant’s pot plate, toilet cemented discarded can and coconut shell had low risk as shown in table 14.

Table 14 Number and percentage of family leaders by preventive risk. (n = 414)

Item	Preventive risk		
	No risk n (%)	**Risk** n (%)	**High risk** n(%)
1. Container	263(63.5)	148(35.8)	3(0.7)
2. Flower vase	356(85.9)	55(13.4)	3(0.7)
3. Plant's pot plate	370(89.3)	43(10.5)	1(0.2)
4. Ant trap	376(90.8)	38(9.2)	-
5. Toilet cemented	284(68.6)	126(30.4)	4(1.0)
6. Discarded can and coconut shell.	372(89.9)	42(10.1)	-
7. Mosquito net/screen	224(54.0)	153(37.0)	37(9.0)
8. Insecticide	231(55.8)	178(43.0)	5(1.2)
9. Smog	29(7.0)	186(44.9)	199(48.1)
10. Campaign	176(42.5)	187(45.2)	51(12.3)

Table 15 Number percentage mean and standard deviation by behavior prevention on dengue hemorrhagic fever.

Behavior prevention on	**Preventive on DHF Behavior**				
Dengue hemorrhagic fever	**usually (%)**	**sometime (%)**	**Never (%)**	$\bar{x}$	**SD**
1. Do you cover water jar after using immediately?	36.5	13.0	50.5	.86	.923
2. Do you ever examine the mosquito larvae in your water jar?	32.1	22.5	45.4	.87	.872
3. If there is mosquito larvae, do you ever remove it or put abate sand in the water?	29.2	20.3	50.5	.79	.868
4. Do you ever change the water in a flower vase every week?	35.7	13.8	50.5	. 85	.918
5. Do you ever change the water or put abate sand into a flower pot's plate every week?	15.9	10.4	73.7	.42	.751
6. Do you ever change water, put abate sand or detergent into ant trap every week?	14.5	9.2	76.3	.38	.726
7. Do you ever examine the mosquito larvae in cemented container in your house?	58.9	18.1	22.9	1.36	.831
8. If you found the mosquito larvae in cemented container do you ever clean and get it out?	55.3	22.9	21.7	1.34	.812
9. Do you ever examine any discarded thing in your surrounding area of your house?	9.4	9.2	81.4	.28	.625
10. If yes, do you ever put them in the garbage?	11.6	7.0	81.4	.30	.666
11. Do you have mosquito net or mosquito screen in your house?	40.9	36.0	17.1	1.30	.744

Table 15 Number percentage mean and standard deviation by preventive behavior on dengue hemorrhagic fever. (cont.)

Behavior prevention on	**Preventive on DHF Behavior**				
Dengue hemorrhagic fever	**usually (%)**	**sometime (%)**	**Never (%)**	$\bar{x}$	**SD**
12. Do you ever use mosquito insecticide?	29.7	43.0	27.3	1.02	.756
13. Does your community have ever use insecticide smog during epidemic nearby?	10.4	39.6	50.0	.60	.669
14. Spraying smog when there are infected patient in the community	9.2	35.7	55.1	.54	.658
15. Do you have any campaign of DHF in your community regularly?	42.5	42.8	14.7	1.28	.705

Part III Association between socio-demographic, predisposing, enabling and reinforcing factors on prevention of dengue hemorrhagic fever.

2.3 Association between socio-demographic composes of age, sex, religion, education ,occupation and family income found that

Gender has no association between the risk of preventive behavior on dengue hemorrhagic fever among family leaders in this study (p-value = 0.263) meaning that even male or female have the same preventive behavior like each others (Table 16)

Table 16 Association between gender and risk behavior of dengue hemorrhagic fever.

Gender	Risk preventive behavior on dengue hemorrhagic fever							
	High		Moderate		Low		Total	
	No.	%	No.	%	No.	%	No.	%
Male	26	10.1	87	60.4	31	21.5	144	100
Female	35	13.0	183	67.8	52	19.3	270	100
Total	61	14.7	270	65.2	83	20.0	414	100
X^2 = 2.674			df = 2		p-value = .263			

From the results between age and risk behavior on preventive behavior of dengue hemorrhagic fever had no association to each other due to p-value = 0.742 mean among the age of family leaders not significant in the preventive behavior of prevention of dengue hemorrhagic fever. (Table 17)

Table 17 Association between age and risk behavior of dengue hemorrhagic fever

Age	Risk preventive behavior on dengue hemorrhagic fever							
	High		Moderate		Low		Total	
	No.	%	No.	%	No.	%	No.	%
Less than 24	4	13.8	20	69.0	5	17.2	29	100
25-29	8	19.0	24	57.1	10	23.8	42	100
30-34	7	17.9	23	59.0	9	23.1	39	100
35-39	12	21.8	33	60.0	10	18.2	55	100
40-44	3	6.7	32	71.1	10	22.2	45	100
45-49	9	13.2	49	72.1	10	14.7	68	100
50	18	13.2	89	65.4	29	21.3	136	100
Total	61	14.7	270	65.2	83	20.0	414	100
X^2 = 8.536			df = 12		p-value = .742			

From the results the marital status had no significant in association with the risk of preventive behavior due to the p- value = 0.003 means that not even any marital status that they had performed in the prevention of dengue hemorrhagic fever quite the same. (Table 18)

Table 18 Association between marital and risk behavior of dengue hemorrhagic fever

Marital status	Risk preventive behavior on dengue hemorrhagic fever							
	High		Moderate		Low		Total	
	No.	%	No.	%	No.	%	No.	%
Single	18	26.9	34	50.7	15	22.4	67	100
Married/live together	23	9.6	166	69.2	51	21.3	240	100
Married/separate	13	24.1	31	57.4	10	18.5	54	100
Widow/Divorce	7	13.2	39	73.6	7	13.2	53	100
Total	61	14.7	270	65.2	83	20.0	414	100
X^2 = 19.75			df = 6		p-value = 0.003			

From the results of income and a risk of preventive behavior on dengue hemorrhagic fever. There were not significant in a association of both income and risk behavior of prevention of dengue hemorrhagic fever. The p-value = 0.040 (Table 19)

Table 19 Association between income and risk behavior of dengue hemorrhagic fever

Income	Risk preventive behavior on dengue hemorrhagic fever							
	High		Moderate		Low		Total	
	No.	%	No.	%	No.	%	No.	%
Less 3,000	7	20.6	23	67.6	4	11.8	34	100
3,001-5,000	7	9.5	47	63.5	20	27.0	74	100
5,001-7,000	13	12.6	61	59.2	29	28.2	103	100
7,001	34	16.7	139	68.5	30	14.8	203	100
Total	61	14.7	270	65.2	83	20.0	414	100
X^2 = 13.17			df = 6		p-value = 0.040			

From the results of association between an occupation and a risk behavior among the family leaders found that there were not significant in association due to the P-value = 0.314 means any kinds of the occupation did not change the behavior in the prevention of dengue hemorrhagic fever.

Table 20 Association between occupation and risk behavior of dengue hemorrhagic fever

Occupation	Risk preventive behavior on dengue hemorrhagic fever							
	High		Moderate		Low		Total	
	No.	%	No.	%	No.	%	No.	%
Unemployed	6	24.0	14	56.0	5	20.0	25	100
Housewife	19	14.7	89	69.0	21	16.3	9	100
Government officer	8	24.2	17	51.5	82	4.2	33	100
Employee	16	10.8	99	66.9	33	22.3	148	100
Labor	2	40.0	3	60.0	0	0	5	100
Others	10	13.5	48	64.9	16	21.6	74	100
Total	61	14.7	270	65.2	83	20.0	414	100

$X^2 = 11.58$ df = 10 p-value = 0.314

From the results of the association between education and a risk of preventive behavior found that there were not significant in association to each others due to the p-value = 0.349, meaning that any level of education did not change the behavior of the family leaders in the preventive behavior side.(Table 21)

Table 21 Association between education and risk behavior of dengue hemorrhagic fever

Education	Risk preventive behavior on dengue hemorrhagic fever							
	High		Moderate		Low		Total	
	No.	%	No.	%	No.	%	No.	%
Illiteracy	1	11.1	4	44.4	4	44.4	9	100
Primary school	20	13.4	105	70.5	24	16.1	149	100
Secondary school	12	13.6	54	61.4	22	25.0	88	100
High school	14	16.9	51	61.4	18	21.7	83	100
Diploma	2	6.3	25	78.1	5	15.6	32	100
Bachelor degree/equal	8	20.5	24	61.5	7	17.9	39	100
Higher than bachelor	4	28.6	7	50.0	3	21.4	14	100
Total	61	14.7	270	65.2	83	20.0	414	100

$X^2 = 13.27$ df = 12 p-value = 0.349

From the result of an association between a knowledge and a risk of behavior on preventive of dengue hemorrhagic fever found that there were not significant in the relation on the preventive behavior of dengue hemorrhagic fever due to the p = 0.016 means that even they had good in knowledge about the disease and the prevention of dengue hemorrhagic fever but they might not perform in the prevention of the disease. (Table 22)

Table 22 Association between knowledge and risk behavior of dengue hemorrhagic fever

Knowledge	Risk preventive behavior on dengue hemorrhagic fever							
	High		Moderate		Low		Total	
	No.	%	No.	%	No.	%	No.	%
Good	9	10.2	57	64.8	22	25.0	88	100
Moderate	6	18.2	25	75.8	2	6.1	33	100
Low	46	15.7	188	64.2	59	20.1	293	100
Total	61	14.7	270	65.2	83	20.0	414	100
X^2 = 6.57			df = 4		p-value = 0.160			

From the result of the association between an attitude and a risk behavior on preventive of dengue hemorrhagic fever found that there were significant in association between the attitude and the risk behavior on preventive of dengue hemorrhagic fever due to the P< 0.001, meaning that the family leaders which had good attitude in the prevention of the dengue hemorrhagic fever will have good result in the prevention of the disease. (Table 23)

Table 23 Association between attitude and risk behavior of dengue hemorrhagic fever

Attitude	Risk preventive behavior on dengue hemorrhagic fever							
	High		Moderate		Low		Total	
	No.	%	No.	%	No.	%	No.	%
Good	7	9.9	51	71.8	13	18.3	71	100
Moderate	49	16.2	188	62.0	66	21.8	303	100
Low	5	12.5	31	77.5	4	10.0	40	100
Total	61	14.7	270	65.2	83	20.0	414	100
X^2 = 45.5			df = 9		p-value = <.001			

Knowledge about a disease and risk preventive behavior on dengue hemorrhagic fever among family leaders had significant negative correlation to the risk preventive behavior(r = -0.186, p-value = <.001), meaning the family leaders had more knowledge on the disease and prevention would have low risk preventive behavior too.(table 24) While in attitude about the risk prevention of dengue hemorrhagic fever had not significant (r = -.084, p-value = .089), meaning that the family leaders had low in attitude to prevention of dengue hemorrhagic fever would have high risk on preventive behavior.(table 24).

Table 24 Correlation coefficient between knowledge and attitude on risk preventive behavior of dengue hemorrhagic fever among family leaders.

Variables	**correlation coefficient (r)**	**p-value**
Knowledge	-0.186	<.001
Attitude	-0.084	0.089

The information about the prevention of dengue hemorrhagic fever from media on family leaders had significant association to the risk preventive behavior(r = -.197, P-value = <.001), meaning that more information about the prevention of dengue hemorrhagic fever among family leaders would have good result in the preventive behavior among the family leaders.(Table 25)

The advice and supervision from Public health officers about the prevention of dengue hemorrhagic fever among family leaders had significant association to the risk preventive behavior(r = -1.97, p-value = <.001), meaning more advice and more supervision from public health officers would have lower risk on the preventive behavior among the family leaders.(Table 25)

Table 25 Association between the information about dengue hemorrhagic fever from the media, others sources and the advice from the health officers.

Variables	correlation coefficient (r)	p-value
The information from media	-.197**	< .001
Advice from health officers	-.191**	< .001

**.Correlation is significant at the 0.01 level

Table 26 Shown the result of hypothesis with the association between the variables in the study on the preventive behavior of dengue hemorrhagic fever among the family leaders.

Factors	Statistic test	p-value	Result in the study
Socio-demographic			
-Age	Chi-square test	.214	Reject research hypothesis
-Sex	Chi-square test	.671	Reject research hypothesis
Religion	Chi-square test	< .001	Accept l research hypothesis
Education	Correlation	. 513	Reject research hypothesis
Occupation	Correlation	. 067	Reject research hypothesis
Family income	Correlation	.405	Reject research hypothesis
Predisposing factors			
-Knowledge	Correlation	< 0.001	Accept research hypothesis
-Attitude	Correlation	.089	Reject research hypothesis
Enabling factors			
-Adequate resources	Chi-square test	< .001	Accept research hypothesis
Reinforcing factors			
-Information from media	Correlation	< .001	Accept research hypothesis
-Supporting and advice from health officers	Correlation	< .001	Accept research hypothesis

CHAPTER 5
DISCUSSION

This study was a descriptive research aiming to examine the preventive behaviors on dengue hemorrhagic fever among family leaders in Ban chang lo, Bangkok-noi, Bangkok. To identify the association between the factors associated to preventive behavior on dengue hemorrhagic fever.

Discussion divided into 2 parts

Part 1 Discussion about the method of study

Part 2 Discussion about the result of the study

Part 1 Discussion about the method of the study

1.1 Type of the study: This study was the cross-sectional survey research for the study of the preventive behavior on dengue hemorrhagic fever among the family leaders and study about the association of the socio-demographic(age, gender, religion, education, occupation and family income) predisposing factors(knowledge in prevention on dengue hemorrhagic fever, attitude in prevention on dengue hemorrhagic fever) enabling factors(adequate resources for the prevention on dengue hemorrhagic fever) reinforcing factors(information of dengue hemorrhagic fever from media, supporting and supervision from public health officers) between the preventive behavior among family leaders in ban chang-lo Bangkok-noi Bangkok. The cross-sectional study is one of the study that emphasis within a period of time of the study which can bring to solve the problem on time beside that this study can collect the data within a short period of time and can explain the situation , hypothesis, evaluation and the prediction of the situation. The researcher in this study wants to know the situation of the problem in present. Even there were many of the study about dengue hemorrhagic fever but about the factors and the association of the preventive behavior still very few in this area of study and the researcher want to know the data.

1.2 in this part for the purpose of the planning and solving the problem within the present situation.

1.3 Sample size: Calculated by the formula for the average of the sample size and the researcher using the average of the previous study. From the calculated we had 376 of family leaders and add 10% more than the theoretical sample sizes were collected in case the data was missed. Therefore, 414 cases were collected from the family leaders in 14 communities of Ban chang lo sub-district, Bangkok-noi, Bangkok. Calculated the proportion of family leaders in each of community and multiply by 376 for the number of each community to be collected. The reason for selected this community for the study because this community had average of the dengue infected patient within high tendency.

1.4 Research instrument In this study used the questionnaires consisted of 7 parts such as questionnaire about data of socio-demographic, questionnaire about the knowledge, questionnaire about the attitude on preventive behavior on dengue hemorrhagic fever, questionnaire about preventive practice on the prevention on dengue hemorrhagic fever, questionnaire about the adequate resources for the prevention on dengue hemorrhagic fever, questionnaire about the information about the prevention on dengue hemorrhagic fever and the questionnaire about the supporting and supervision from public health officers. The questionnaire were made by the study of reviewed literature, previous study about dengue hemorrhagic fever, and corrected by 3 advisors and 3 panels of experts consisting of one pediatrician and two family nurses from public health center. The questionnaire was conducted to 30 families' leaders in Bang khunsri sub- district to find the reliability in the questionnaire about the knowledge and attitude found that reliability as 0.7 and 0.75 in order.

1.5 Sampling technique: the researcher, accompanied by family nurses and public health officers from Wat chao-aum public health center, explained the objective of the study and the dictate how to answer the questionnaire in each item to the health volunteers.

1.6 Statistical analysis: The researcher analyzed the data by descriptive analysis by number, percentage, mean, and standard deviation in the study of socio-demographic data of the family leaders .For those data measure by nominal the researcher were using the chi-square in testing the association between the independent variables and dependent variables. For those data measured in the interval scale the researcher analyzes the association with the Pearson's correlation coefficient between the independent variables and dependent variables.

Part 2 Discussion about the result of the study divided into 2 portions

2.1 socio-demographic data

2.2 The association between the independent variables and preventive behavior on dengue hemorrhagic fever among family leaders.

2.1 Socio-demographic of family leaders' sample.

2.1.1 Socio-demographic of family leaders.

The sample groups of this study were the family leaders in Ban chang lo, Bangkok- noi, Bangkok about 414 persons. There were male 144 and female 270 persons. Most of them were more than 50 years old ranking about 32.9%. The family leaders in the study group mostly were married and living together about 58.0% and 98.6% they were Buddhism, the rest were Muslim and others. About the family income per month, the averages of income were ranked in high income about more than 7,000 baht per month equal to 49%. Most of the family leaders they worked as the employees and few of them educated more than bachelor degree mostly study at the level of primary school ranging about 36%.

2.1.2 Knowledge about the disease and prevention of dengue hemorrhagic fever.

From the study the sample groups got the score between 10-12 scores from 12 scores. The average scores equal to 10.48 scores as 82.1 percentages had high level of knowledge. 13.8 percentages had the knowledge in the moderate level and 4.1 percentages were within the low level of knowledge as shown in Table 3. Which was comparable with the study of Neuala-ao wiwatvorapan [71] The study of the

evaluation project in prevention and control of dengue hemorrhagic fever in primary school(grade 6) about 500 students and found that most of the sample groups had moderate level of knowledge in prevention and control. As well as the study of N. Khantikul et al [55] the study of knowledge and use of prevention measures related to dengue in northern Thailand found that the overall knowledge of dengue was high, but housewives, unemployed and old persons had relatively little knowledge of dengue. Persons with knowledge of the disease more frequently reported the use of preventive measures, indicating the value of education programmes as a tool in dengue prevention.

When consider in each item of the questionnaire found that most of the sample they had good knowledge in the following item as known about weekly cleansing the containers can reduce the number of mosquito(97.3%)(item 11) known about that Aedes agypti mosquito is the vector for dengue hemorrhagic fever(97.1%)(item 1), Known that storage water in the bathroom and flower vase are the breeding place for day bite mosquito(96.6%)(item 9),known that infected dengue hemorrhagic fever patients can cause of death(95.7%)(item 7) known that larvivorous fishes can prevent dengue hemorrhagic fever by eating mosquito papule and larvae(94.0%)(item 12), known that sleeping in the mosquito net /mosquito screen all the time can prevent dengue hemorrhagic fever(91.8%)(item 10), known that abrupt high grade of fever and with myalgia and petechiae are indicated for dengue hemorrhagic fever(91.3%), known that day bite mosquito are causing dengue hemorrhagic fever(91.1%)(item 2),known about children are more risk for dengue hemorrhagic fever infected patients than adults(88.9%)(item 4), known about all season in Thailand can cause dengue hemorrhagic fever but rainy season is the most epidemic season(88.2%)(item 3). The sample group had good knowledge in those items may be due to these were the basic knowledge that the public health officers always presented every time that they met the people in the communities. For some other questionnaires that the sample had low knowledge about like vaccinization can prevented for DHF 49.3% of unknown (item 8) and about when you have fever and suspected for DHF Paracetamol is the drug of choice for 35% of unknown. The sample know very few about these items the researcher think that because in this questionnaire quite specific about the knowledge

for the people in the communities and for the questionnaire about Paracetamol, by observing the sample they know just only for Para not in the term of Paracetamol. That is the reason why in this questionnaire that they have quite low in the knowledge. And another reason that when the public health officer gave them the knowledge about the fever with myalgia or suspected to be dengue hemorrhagic fever can not use Aspirin because it will cause the function of platelet count decrease but they never emphasis that paracetamol is the drug of choice that can use for fever.

From the data collection the researcher observed that most of family leaders in Ban chang lo they had a good knowledge but in the real situation they might not practice in term of the prevention of the disease or it can say that they were careless unless anybody in family member got disease they will do the practice of prevention. Compatible with the study of N. Khantikul[55], knowledge and use of prevention measures related to dengue in northern Thailand out of 1650 persons, 67% had knowledge of dengue, knowledge of dengue significantly differed by age, sex, occupation and site(p-value< 0.05). Younger people knew more about dengue than older persons. In comparison with students it was significantly higher among students, but lower among housewives or unemployed persons.

2.1.3 Attitude to the preventive behavior on dengue hemorrhagic fever.

From the study most of sample had the average scores at 38-45 scores and mean scores at 43.3 scores. 73.2 percentages had moderate attitude to the preventive behavior on dengue hemorrhagic fever and 9.7 percentages had low level of attitude on preventive behavior on dengue hemorrhagic fever. (Table 5) as in the study of Neualaao wiwatvorapan[56] the study of the evaluation of prevention and control of dengue hemorrhagic fever in primary school, mueang, Nakornrachasrima found that most of the student in primary school had moderate level of attitude to the prevention and control of dengue hemorrhagic fever, following with the high and low level. In this study when we make the association with the risk of the preventive behavior , we found that there had no association due to the P-value = .089 , Meaning that even the attitude of the family leaders had moderate level but they might not concern about the prevention eventhough the public health officers always give them the information

about the prevention and control of the disease or may be because the public health officers give them too much knowledge and the attitude awareness til they feel that it quite normal to do that.

2.1.4 Family income of family leaders

Divide family income into 3 levels, most of the family leaders had family income at the level of high level of income average at more than 7,000 baht a month. 42.8 percentages were moderate level of income and 8.2 percentages were low family income(less than 3,000 baths a month). Which difference from the study of Rachanee pudkhuntod [56] the study of factors affecting dengue hemorrhagic fever control and preventive behavior of people in Muang Suphanburi Province found that most of family health leaders had low income average about 13,001 per year. So did with the study of Wannapa yanroj [67] the study of factor affecting to dengue hemorrhagic fever in Bureerum Province, found that most of the sample study had income less than 1,000 bath a month.

2.1.5 Adequate resources on the preventive behavior on dengue hemorrhagic fever

From the study found that most of family leaders had enough resources in prevention of dengue hemorrhagic fever and when consider in each of the resources found that 86.7 percentages had enough in mosquito net and mosquito screen, for the cover of the container found that 68.6 percentages were not enough so did with the abate sand 71 percentages were not enough. As in the study of Wipa limkhamsuk [72] The evaluation of the technology in a appropriate of the development of resources in prevention and control of dengue hemorrhagic fever found that those family that used destroy of mosquito net and mosquito screen developed dengue hemorrhagic fever about 30.1 percentages and the study of Wannapa yanroj [67] the study of factor affecting to dengue hemorrhagic fever in Bureerum Province, found that in those district that develop high rate of dengue hemorrhagic fever had low percentages to use the cover in all water containers.

2.1.6 Information of media on preventive behavior on dengue hemorrhagic fever

Most of family leaders received information in high level of 52.9 percentages follow by moderate and low level as 37.4 and 9.7 percentages in order as shown in table 10.

When consider in each item of the information found that 79.2 percentages had inform that prevention mosquito bite was the best way to prevent dengue hemorrhagic fever and 77.8 percentages had inform that elimination of breeding places in community will decrease dengue hemorrhagic fever. But for those had received few information from others such as sleeping in mosquito net and screen can prevent dengue hemorrhagic fever about 7.8 percentages.

From the data above found that those family leaders had known before about the information of the prevention of dengue hemorrhagic fever so after they were emphasis again by the media will let them quite easy to remember, beside that all of the in formations were those had been emphasis before. Consider with type of the media information most of family leaders they received the information mostly from television at 90.6 percentages follow with the announcement and health volunteers about 83.3 and 82.4 percentages. As the study of Rakshanda Farid [74] Role of information sources and sociodemographic factors on knowledge about AIDS in female adolescents, found out that those students who read the editorial, columns and magazine section of newspapers had satisfactory knowledge about AIDS as compared to those students who read the political and sports section of the newspapers. Assess to television, satellite channels and Internet had a statistically significant effect on knowledge about AIDS ($p<0.0001$). The newspaper and electronic media also have an important role in transmitting knowledge about AIDS. Family members, friends and teachers can prove to be a potential source for dissemination of information about AIDS so did with dengue hemorrhagic fever.

2.1.7 Supportive and supervision from public health officers on preventive behavior of dengue hemorrhagic fever

Most of family leaders had received an advice and supervision from health officers in the level of high scores as 77.1 percentages and moderate to low scores as 4.6 and 18.4 percentages in order.

From the study found that most of family leaders had received the advice and supervision from public health officers in the topic of prevention of mosquito bite is the best way to prevent dengue hemorrhagic fever (item 3), as well as elimination of breeding places in community will decrease dengue hemorrhagic fever (item 4) and advise that dengue hemorrhagic fever cause by Aedes mosquito (item 1). For those topic that family leaders received less from public health officers were sleeping in the mosquito net and screen can prevent dengue hemorrhagic fever (item 6) and fever with myalgia , in dengue hemorrhagic fever, paracetamol is drug of choice (item 5). And by observing and discussing with public health officers found that most of family leaders had received the advice and supervision about prevention more than one time but in some groups of topic had received an advice one time or less. For example that advise by health officers , dengue hemorrhagic fever even ever infected, having chance to infect again had received more than one time about 72.5 percentages or sleeping in the mosquito net and screen can prevent dengue hemorrhagic fever had received one time about 18.1 percentages.

2.2 The association between independent variables and preventive behavior on dengue hemorrhagic fever among family leaders on the hypothesis of the research study.

2.2.1 Socio-demographic factors (age, sex, religion, occupation, and family income) are associated to preventive behavior among family leaders.

From the study found that gender, age, occupation, education had no associated between the risk of preventive behavior on dengue hemorrhagic fever among family leaders (p- value> 0.05), while marital status, income, religion had associated between

the risk of preventive behavior on dengue hemorrhagic fever among family leaders (p-value < 0.05).

2.2.2 Predisposing factors (knowledge, attitude) are associated to preventive behavior on dengue hemorrhagic fever among family leaders

From the study found that knowledge had significant association between the risk of preventive behavior on dengue hemorrhagic fever among family leaders (r = -0.186, p-value = <0.001) the study had accept to the hypothesis with the family had more knowledge about the disease and prevention would have more preventive behavior on dengue hemorrhagic fever. As the study of Phan Quan [69] the study of Preventive practice for dengue and dengue hemorrhagic fever and its correlating factors of phong dien townlet residents Thua Thien Hue province, Vietnam.found that there was a significant association between the residents' preventive practice and knowledge, attitude, residents' participation and their support sources and occupational groups, but there was no significant association between the residents' practice for preventing DF/DHF and gender, age groups and educational groups.

2.2.3 Enabling factors (resources for preventive behavior on dengue hemorrhagic fever) are associated to preventive behavior on dengue hemorrhagic fever among family leaders.

From the study found that the adequate of resources for preventive behavior on dengue hemorrhagic fever had significant association between the risk preventive behavior on dengue hemorrhagic fever among family leaders (p- value = < 0.001) the study was accepted to the hypothesis that more adequate of resources would had a good preventive behavior among family leaders [69]. vice versa if there were lacking of the resources would have some problem in the prevention and preventive behavior on dengue hemorrhagic fever too. As the study of Wipa limkamsuk [73] the study of the appropriate evaluation technique for development of resources in prevention and control of dengue hemorrhagic fever, found that using destroyed mosquito net had significant association to the infected dengue hemorrhagic fever.

2.2.4 Reinforcing factors (information, supporting and supervision of public health officers) are associated to preventive behavior among family leaders.

From the study found that there were significant association between the information from media and supporting and supervision from public health officers between risk preventive behavior on dengue hemorrhagic fever among family leaders (P-value =<0.001) the study had accept to the hypothesis that more information and more supporting and supervision to family leaders would had a good prevention and preventive behavior on dengue hemorrhagic fever.

CHAPTER 6
CONCLUSION AND RECOMMENDATION

6.1 Conclusion

This study was a cross-sectional descriptive study aiming to identify the factors associated to preventive behavior on dengue hemorrhagic fever among family leaders in Ban Chang lo Sub-district, Bangkok- noi, Bangkok. The association between the socio-demographic such as gender, age , religion, education, occupation and family income to preventive behavior among family leaders on dengue hemorrhagic fever, predisposing such as knowledge in disease and prevention on dengue hemorrhagic fever , attitude in prevention on dengue hemorrhagic fever, enabling such as adequate resources for prevention on dengue hemorrhagic fever , and reinforcing factors such as information of dengue hemorrhagic fever from media, supporting and supervision from public health officers. The sample from family leaders in Ban chang lo, Bangkok-noi, Bangkok total 414 persons, collecting the data by the family nurses and health volunteers from February 1 -18, 2005 by using the questionnaires , Analyzing the data with percentage, Mean, standard deviation, Analyzed the association by chi-square test and find the correlation with pearson's product moment correlation. The data were analyzed as follows:

6.1.1 Socio-demographic data of family leaders.

- **Demographic data**

Family leaders in this study were 414 persons, male and female as 34.8 and 65.2 percentages in order. Most of family leaders were in the rank of more than or equal to 50 years old (32.9%) and follow by age between 45-49 years old (16.4%). Most of family leaders were married and living together about 58 percentages, followed by single as 16.2 percentages. 96.6 percentages were Buddhism the rest were Muslim and others. Most of family leaders were employees about 35.7

percentages followed by housewife and husband about 31.2 percentages. The family income were about more than or equal to 7,001 baht per month as 49 percentages and follow by 5,001-7,000 baht per month as 24.9 percentages. Most of family leaders were educated at primary school level about 36 percentages and followed with secondary school as 21.3 percentages and 20.0 percentages.

6.1.2 Predisposing data, enabling data, reinforcing data and risk preventive behavior on dengue hemorrhagic fever.

- **Data about the variables in predisposing, enabling and reinforcing factors.**

- **Predisposing factors**
  - Knowledge in prevention on dengue hemorrhagic fever were 10.5 scores (total scores were 12). Most of family leaders had high level of scores about 82.1 percentages, follow by 13.8 percentages in moderate and 4.1 percentages in low level of scores.

  - Attitude in prevention on dengue hemorrhagic fever were 43.3 scores. Most of family leaders had moderate level of attitude about 73.2 percentages, 17.1 percentages as good and 9.7 percentages as low attitude in prevention of dengue hemorrhagic fever.

- **Enabling factors**
  - Adequate resources for prevention on dengue hemorrhagic fever most of family leaders had adequate in mosquito net and screen about 86.7 percentage and for cover and abate sand there were not enough in prevention on dengue hemorrhagic fever.

- Reinforcing factors

- Information of dengue hemorrhagic fever from media. Most of family leaders had high scores on receiving information from media about 52.9 percentages, follow with moderate level of scores at 39.4 percentages and low as 18.4 percentages.
- Supporting and supervision on dengue hemorrhagic fever. Most of family leaders had high level of scores about 77.1 percentages; follow with low level of scores at 18.4 percentages.

6.1.3 The association between socio-demographic, predisposing factors, enabling factors and reinforcing factors with the risk of preventive behavior on dengue hemorrhagic fever.

- The association between socio-demographic and risk preventive behavior on dengue hemorrhagic fever.

- Age had no significant association with risk preventive behavior on dengue hemorrhagic fever (p-value = > 0.05)
- Sex had no significant association with risk preventive behavior on dengue hemorrhagic fever (p-value = > 0.05)
- Religion had significant association with risk preventive behavior on dengue hemorrhagic fever (p-value = < 0.05)
- Education had no significant association with risk preventive behavior on dengue hemorrhagic fever (p-value = > 0.05)
- Occupation had no significant association with risk preventive behavior on dengue hemorrhagic fever (p-value = > 0.05)
- Family income had no significant association with risk preventive behavior on dengue hemorrhagic fever (p-value = > 0.05)

6.1.4 The association between predisposing factors and risk preventive behavior on dengue hemorrhagic fever.

- Knowledge had no significant association with risk preventive behavior on dengue hemorrhagic fever (r = -0.186, p-value = < 0.05)
- Attitude had significant association with risk preventive behavior on dengue hemorrhagic fever (r = -0.084, p-value = > 0.05)

6.1.5 The association between enabling factors and preventive behavior on dengue hemorrhagic fever.

- Adequate resources had significant with the risk preventive behavior on dengue hemorrhagic fever (p-value< 0.05)

6.1.6 The association between reinforcing factors with preventive behavior on dengue hemorrhagic fever

- Information from media had significant association with the risk preventive behavior on dengue hemorrhagic fever(r = -0.197,
  p-value = < 0.05)
- Advice and supervision from pubic health officers had significant with risk preventive behavior on dengue hemorrhagic fever(r = -0.191
  p-Value = < 0.05)

6.2 Recommendation

1. Method which was used in this study about behavior should be a combination of many procedures such as interview, observation of the researcher in the community besides that if we can make an evaluation interval it would help us in the evaluation more collect.

2. Need to have more variables to study about preventive behavior of family leaders such as factors associated to an environment, types of the housing, number of family members in the family.
3. For the next study need to study about the implementation by using the results from this study to improve plan and project for prevention and control of dengue hemorrhagic fever.
4. Need to have an evaluation to public health officers on the prevention of dengue hemorrhagic fever for the purpose of improvement.
5. Need to study about the information from media that had effectiveness to people in community.
6. Public Health Center of BMA can acknowledge from this study and apply this study to administrate and manage their govern community.
7. This study will be a guide to next study about each behavior in dengue hemorrhagic fever prevention and control in other community.
8. For future study, the action research using participatory action research is needed

REFERENCES

1. Pinheiro FP, Corber SJ. Global situation of dengue and dengue haemorrhagic fever and its emergence in the Americas. World Health Stat Q 1997; 50:161–8.
2. World Health Organisation. Prevention and control of dengue and dengue haemorrhagic fever: comprehensive guidelines. WHO Regional publication, SEARO, No 29 1999.
3. Halstead SB. Is there an inapparent dengue explosion? Lancet 1999; 353:1100–1.
4. Nimmannitya S. Dengue haemorrhagic fever: current issues and future research. Asian-Oceanian Journal of Paediatrics and Child Health 2002; 1:1–21.
5. King CC, Wu YC, Chao DY, et al. Major epidemics of dengue in Taiwan in 1981–2000: related to intensive virus activities in Asia. Dengue Bulletin 2000; 24:1–10.
6. Endy TP, Nisalak A, Chunsuttiwat S, et al. Spatial and temporal circulation of dengue virus serotypes: a prospective study of primary school children in Kamphaeng Phet, Thailand. Am J Epidemiol 2002; 156:52–9.
7. Messer WB, Gubler DJ, Harris E, et al. Emergence and global spread of a dengue serotype 3, subtype III virus. Emerg Infect Dis 2003; 9: 800–9.
8. Jelinek T, Muhlberger N, Harms G, et al. Epidemiology and clinical features of imported dengue fever in Europe: Sentinal surveillance data from TropNetEurop. Clin Infect Dis 2002; 35: 1047-52.
9. Swasdivorn S, Swasdivorn V, Rojanasupojana S. Cost analysis of management for dengue haemorrhagic fever in Thailand. Bangkok: Faculty of Tropical Medicine, Mahidol University, 1995
10. Ranghnupathy R, Chaturvedi UC, A1-Sayer, et al. Elevated level of Il-8 in dengue haemorrhagic fever. J Med Viro Nov 1998; 56(3): 280-5
11. Sornmani S, Okanurak K, Indaratna K. Social and economic impacts of dengue haemorrhagic fever in Thailand. Bangkok: Faculty of Tropical Medicine, Mahidol University. 1997.

12. Survellence Bull. Control dis dev. Department of Public Health , Bangkok; 2003: 57-8.

13. Disease and Control department, Public Health 2001. The report on denguehemorrhagic fever in Thailand; 1958-2001.

14. Good CV, editor. Dictionary of education. New York : Mc Graw-hill Book; 1973.

15. Bloom BS, editor. Taxonomy by education objective : hand book I cognitive domain. New York: David Mcky; 1956.

16. Swasdivorn S, Swasdivorn V, Rojanasupojana S. Cost analysis of management for dengue haemorrhagic fever in Thailand. Bangkok: Faculty of Tropical Medicine, Mahidol University, 1995

17. Harris DM, Guten S. Health protective behavior: an exploratory Study. J Health Soc Behav. 1979 March; 20: 17-29.

18. Rico-Hesse R. Microevolution and virulence of dengue viruses. Adv Virus Res 2003; 59:315–41.

19. Nimmanitya S, et al. Serotype-specific dengue virus circulation and dengue in Bangkok, Thailand from 1973 to 1999. Am J Trop Med Hyg 2003; 68:191-202.

20. Hareonsook O , Foy HM, Teeraratkul A, et al. Changing epidemiology of dengue hemorrhagic fever in Thailand. Epidemiol Infect 1999; 122:161–6.

21. Ha DQ, Tien NT, Huong VT, et al. Dengue epidemic in Sounthern Vietnam, 1998. Emerg Infect Dis 2000; 6:422-5.

22. Anonymous. Dengue in the WHO Western Pacific Region. Wkly Epidemiol Rec. 1998; 72: 273–80.

23. Nimmanitaya S. Dengue hemorrhagic fever in Thailand. South East Asia J Trop Med Pub. Hlth. 1987; 18(3):291-2

24. Nimmanitya S, Thisyakorn U, Hemsrichart V. Dengue hemorrhagic fever with unusual manifestations. Southeast Asia J Trop Med Public Health 1987;18:398-406.

25. Kantachuvessiri A. Dengue hemorrhagic fever in Thai society. Southeast Asian J Trop Med Public Health 2002; 33:56-62.

26. Saengtharatip s. Dengue/DHF prevention and control program. Office of Dengue Control. Department of Communicable Disease Control, Ministry of Public Health, Thailand. 2001: 5-7.
27. Sornmani S, Okanurak K, Indaratna K, et al. Economic perspective of DHF. In: Scial and Economic impact of dengue hemorrhagic fever in Thailand. 1995: 58-86.
28. Rigau-Perez, the Puerto Rico Association of Epidemiologists. Clinical manifestations of hemorrhagic fever in Puerto Rico, 1990-1991. Rev Panam Salud Publica 1997; 1: 381-8.
29. Ahmed FU, Mahmood CB, Sharma JD, et al. Dengue fever and dengue hemorrhagic fever in children the 2000 out break in chittatong, Bangladesh. Dengue Bull 2001; 25: 33-9.
30. Narayanan M , Aravind MA, Thilothammal N, *et al*. Dengue fever epidemic in Chennai—a study of clinical profile and outcome. Indian Pediatr 2002; 39(11): 1027–33.
31. Hongsiriwon S. Dengue hemorrhagic fever in infants. Southeast Asian J Trop Med Public Health 2002;33(1): 49-55.
32. Pancharoen **C,** Mekmullica J, Thisyakorn U. Primary dengue infection: what are the clinical distinctions from secondary infection? Southeast Asian J Trop Med Public Health 2001; 32: 476–80
33. Kabra SK, Jain Y, Pandey RM, et al. Dengue haemorrhagic fever in children in the 1996 Delhi epidemic. Trans R Soc Trop Med Hyg 1999**;** 93:294–8.
34. Kalayanarooj S**,** Nimmannitya S, Suntayakorn S, Can doctors make an accurate diagnosis of dengue infections at an early stage? Dengue Bull 1999; 23:1–9.
35. Martinez E , Guzman MG, Valdes M, et al. Dengue fever and hemorrhagic dengue in infants with a primary infection. Rev Cubana Med Trop 1993; 45:97–101.
36. Halstead SB, Lan NT, Myint TT, et al. Dengue hemorrhagic fever in infants: research opportunities ignored. Emerg Infect Dis 2002; 8:1474–9.
37. Mendez A**,** Gonzalez G. Dengue haemorrhagic fever in children: ten years of clinical experience. Biomedica 2003**;** 23: 180–93.

38. Srivastava VK, Suri S, Bhasin A, et al. An epidemic of dengue haemorrhagic fever and dengue shock syndrome in Delhi: a clinical study. Ann Trop Paediatr1990; 10: 329–34.
39. Kabra SK, Jain Y, Pandey RM, et al. Dengue haemorrhagic fever in children in the 1996 Delhi epidemic. Trans R Soc Trop Med Hyg 1999; 93: 294–8.
40. Guzman MG, Kouri G. Dengue: an update. Lancet Infect Dis 2002; 2: 33–42.
41. Agarwal R, Kapoor S, Nagar R, *et al.* A clinical study of the patients with dengue hemorrhagic fever during the epidemic of 1996 at Lucknow, India. Southeast Asian J Trop Med Public Health 1999; 30: 735–40.
42. Guzman MG, Kouri GP, Bravo J, *et al.* Dengue hemorrhagic fever in Cuba, 1981: a retrospective seroepidemiologic study. Am J Trop Med Hyg 1990; 42: 179–84.
43. Thavara U, Tawatsin A, Changsang C, et al. Laval occurrence, oviposition behavior and biting activity of potential mosquito vectors of dengue on Samui Island, Thailand. J Vector Ecol 2001: 26: 172-80.
44. Thu HM, Aye KM, Thein S. The effect of temperature and humidity on dengue virus propagation in Aedes agypti mosquitoes. Southeast Asian J Trop Med Public Health 1998; 29: 280-4.
45. Perich MJ, Davila G, Turner A, *et al.* Behavior of resting Aedes aegypti (culicidae: diptera) and its relation to ultra-low volume adulticide efficacy in Panama City, Panama. J Med Entomol 2000; 37: 541–6.
46. Watts DM, Burke DS, Harrison BA, et al. Effect of temperature on the vector efficiency of Aedes aegypti for dengue 2 virus. Am J Trop Med Hyg 1987; 36: 143-52.
47. Platt KB, Linthicum KJ, Myint KS, et al. Impact of dengue virus infection on feeding behavior of Aedes aegypti. Am J Trop Med Hyg 1997; 57: 119-25.
48. Joshi V, Mourya DT, Sharma RC. Persistence of dengue-3 virus through transovarial transmission passage in successive generations of Aedes aegypti mosquitoes. Am J Trop Med Hyg 2002; 67: 158-61.
49. Van Benthem BH, Khantikul N, Panart K, et al. Knowledge and use of prevention measures related to dengue in northern Thailand. Trop Med Int Health 2002; 7: 993-1000.

50. Kay BH, Nam VS, Tien TV, et al. Control of aedes vectors of dengue in three provinces of Vietnam by use of mesocyclops (copepoda) and community-based methods validated by entomologic, clinical, and serological surveillance. Am J Trop Med Hyg 2002; 66: 40-8.

51. Huong VD, Ngoc NTB. Susceptibility of aedes aegypti to insecticides. Dengue Bull 1999; 23: 85-8.

52. Vezzani D, Schweigmann N. Suitability of containers from different sources as breeding sites of aedes aegypti (L) in a cemetery of Buenos Aires city, Argentina. Mem Inst Oswaldo Cruz 2002; 97: 789–92.

53. Green & Kreuter. Health Promotion Planning: an educational and ecological approach. 3rd ed. Toronto: Mayfield Publishing; 1999.

54. Timmreck, TC. An introduction to epidemiology. 2 nd ed. Boston: Jones and Bartlette 1998: 310-12.

55. B.H.B. van Benthem, N. Khantikul, K. Panart, et al. Knowledge and use of prevention measures related to dengue in north Thailand. Trop Med Int Health 2002; 7(11): 993.

56. Putkhuntod R, Sutheprasert T. Factors Affecting Dengue Hemorrhagic Fever Control and Prevention Behavios of People in Muang Suphanburi Municipality, Suphanburi Province, Prot and Env Health Bull 2002; 25(4): 55-62.

57. Huff, RM Kline, MV. Promoting health in multicultural populations; London : Sage; 1999.

58. Pender, NJ & Pender, AR. Health promotion in nursing practice.2 nd ed. California: Appleton& Lange; 1987.

59. Klinubol S. Factors affecting dengue hemorrhagic fever prevention behavior of students in primary school on Phetchaburi Province[M.Ed. Thesis in Population Education]. Bangkok: Faculty of Graduated Studies, Mahidol University; 1999.

60. Swaddiwudhipong W, Lerdlukanavong P, Khumklam P, Koonchote S, Nguntra P,Chaovaliratipong C. A survey of knowledge, attitude and practice of the prevention of dengue hemorrhagic fever in an urban community of Thailand. Southeast Asian J Trop Med Public Health 1992; 23(2): 207-11.

61. Fishbein M, Ajzen I. Belief attitude intention and behaviors: and introduction to theory and research. Massachusettes : Addison Wesley ; 1975.

62. Khom-mak P. The study of knowledge, attitude and practice on prevention of dengue hemorrhagic fever among health volunteers in Sathing pa, Soung kha province, Thailand[M.Sc. Thesis in family health] Bangkok: Faculty of Graduate Studies, Mahidol University, 1995. (In Thai)

63. Meakmog S. Factors associated with preventive and control behavior toward dengue hemorrhagic fever among school age children, Buri Ram Province [M.Sc. Thesis in family health] Bangkok: Faculty of Graduate Studies, Mahidol University; 1999. (In Thai)

64. Limkhumsuk V. Appropriate technology assessment for prevent and control on dengue hemorrhagic fever: case study of Trang Province, Thailand [M.sc. Thesis in Appropriate Technology]. Bangkok: Faculty of Graduated Studies, Mahidol University; 1997.

65. Budraj S. The study of primary school children in using of abate sand for prevention and control of dengue hemorrhagic fever in small community, [M.Sc. Thesis in health hygiene and behavior] Bangkok: Faculty of Graduate Studies, Mahidol University, 1995.

66. Thisyakorn U, Nimmanitya S. Nutritional status of children with dengue hemorrhagic fever. Clin Infect Dis 1993; 16: 295-7.

66. Yanaroj W. Factors influencing on dengue hemorrhagic fever in Cheingmai: The study of comparable between the highest and lowest Amphour infected of dengue hemorrhagic fever. [M.Sc. Thesis in epidemiology] Bangkok: Faculty of Graduate Studies, Mahidol University, 1991.

67. Chaiyakit S. Behavioral of health hygiene and knowledge in dengue hemorrhagic fever of rural housewives: The study of tombon Namking, Amphour Thatpanom, Thatpanom Province, Thailand.[M.Sc. Thesis in environmental health] Bangkok: Faculty of Graduate Studies, Mahidol University, 1998.

69. Phan.Q. Preventive practice for dengue and dengue hemorrhagic fever and its correlating factors of phong dien townlet residents thua Thien Hue province, Vietnam [M.P.H.M. Thesis in Primary Health Management]. Nakhon Pathom: Faculty of Graduate Studies, Mahidol University; 2001.

70. Bloom BS, editor. Taxonomy by education objective. Hand book I cognitive domain. New York: David Mcky; 1956.

71. Wiwatvorapan N. The evaluation in prevention and control of dengue hemorrhagic fever in primary school, Muang , Nakornrajcahasima Province, Thailand.[M.Sc. Thesis in community medicine] Bangkok: Faculty of Graduate Studies, Chulalongkorn University, 1997.

72. Limkamsuk W. The appropriate technology for development of resources in prevention and control of dengue hemorrhagic fever. [M.Sc. Thesis in Environmental health] Bangkok: Faculty of Graduate Studies, Mahidol University, 1997.

73. Rakshanda F. Role of information sources and sociodemographic factors on knowledge about AIDS in female adolescents, J Cott Physicians Surg Pak 2005;15(1): 18-21.

APPENDIX

APPENDIX A

QUESTIONNAIRES

Title: FACTORS ASSOCIATED TO PREVENTIVE BEHAVIOR ON DENGUE HEMORRHAGIC FEVER AMONG FAMILY LEADERS IN BAN CHANG –LO, BANGKOK –NOI, BANGKOK

Name of community……
Ban Chang-Lo sub-district, Bangkok- noi District , Bangkok
Date interview……..

Please answer all questions in the questionnaire because your answer will be the benefit in all aspect to improve DF/DHF prevention performance in your community.

Part I : Demographic characteristic

Knowledge about DHF
Instruction: Please check (/) or write down the answer.

1. Gender ( ) male ( ) female
2. Age ( ) ≤24 ( ) 40-44
   ( ) 25-29 ( ) 45-49
   ( ) 30-34 ( ) ≥ 50
   ( ) 35-39
3. Marital status
   ( ) single ( ) married / Living together
   ( ) married / separated ( ) Widowed / Divorced
4. Religion
   ( ) Buddhism ( ) Muslim
   ( ) Christian ( ) others
5. Family (bath / month)
   ( ) ≤ 3,000 ( ) 5,001-7,000
   ( ) 3,000-5,000 ( ) ≥ 7,001
6. Occupation
   ( ) Unemployed ( ) Employee
   ( ) Housewife/husband ( ) Labor
   ( ) Government officer ( ) others
7. Education level
   ( ) Illiterate ( ) Diploma
   ( ) Primary school (grade 1-6) ( ) Bachelor degree or equal
   ( ) Secondary school ( ) More than bachelor degree
   ( ) high school

Part II: Knowledge about DHF

Instruction: Please O around the true answer that you think is the most correction answer.

1. Aedes agypti mosquito is the vector for DHF
   ( ) Yes ( ) No ( ) do not know
2. Day bite mosquitos are causing DHF
   ( ) Yes ( ) No ( ) do not know
3. All seasons in Thailand can causes DHF but Rainy season is the most epidemic season.
   ( ) Yes ( ) No ( ) do not know
4. Children are more risk for DHF infected patients than adults
   ( ) Yes ( ) No ( ) do not know
5. Abrupt high grade fever with myalgia and petechiae are indicated for DHF
   ( ) Yes ( ) No ( ) do not know
6. When you have fever and suspected for DHF, Paracetamol is the drug of choice.
   ( ) Yes ( ) No ( ) do not know
7. Infected DHF patients can cause of death.
   ( ) Yes ( ) No ( ) do not know
8. Vaccinization can prevent for DHF.
   ( ) Yes ( ) No ( ) do not know
9. Storage water in bathroom and flower vase is the breeding place for day bite mosquito.
   ( ) Yes ( ) No ( ) do not know
10. Sleeping in the mosquito net/mosquito screening all the time can prevent DHF.
    ( ) Yes ( ) No ( ) do not know
11. Weekly cleaning the container can reduce the number of mosquito larvae.
    ( ) Yes ( ) No ( ) do not know
12. Larvivorous fishes can prevent DHF by eating mosquito papule and larvae.
    ( ) Yes ( ) No ( ) do not know

Part III: Questionaire related to Attitude on prevention behavior of DHF.

Instruction: Please check / in each column

statement	Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1. Dengue hemorrhagic fever is the preventable disease without difficulty.					
2. You are one of important persons in prevention and control of DHF.					
3. No need to get rid of the mosquito breeding place in family who's never infected.					
4. You are willing to join the campaign in getting rid of the mosquito breeding place.					
5. Infected with DHF as normal as common cold.					
6. Finding and getting rid of the mosquito breeding place are all duty.					
7. Weekly clean up all containers are very difficult to do.					
8. Advantage of tight cover will prevent mosquito laying egg.					
9. Standstill water in ant-trap& flower vase is important breeding sites for mosquito.					
10. Larvivorous and gubby fish are the easy way to get rid of mosquito larvae.					
11. Only smogging is enough to prevent mosquito, no need for others way.					
12. No need to sleep insides mosquito net because it is uncomfortable.					

SD = Strongly disagree (1) **DS** = Disagree (2) **U** = Undecided (3)
A = Agree (4) **SA** = strongly agree (5)

Part IV : Questionnaire related to prevention behavior to DHF

Instruction; please check / in front of the correct answer.

Item	Statement	Practice
	Type of container and getting rid of larvae	
1	Drinking and using water jars	1.1 Do you have any drinking and using jars in your house? ( ) yes ( ) no [skip to no. 2] 1.2 Do you cover water jar after using immediately? ( ) usually ( ) sometime ( ) never 1.3 Do you ever examine the mosquito larvae in your water jars? ( ) usually ( ) sometime ( ) never 1.4 If there is mosquito a larva, do you ever remove it or put abate sand in the water? ( ) usually ( ) sometime ( ) never
2	Water in flower vase	2.1 Do you have any flower vase in your house? ( ) yes ( ) no [skip to no.3] 2.2 Do you ever change the water in the flower vase every week? ( ) usually ( ) sometime ( ) never
3	Water in flower pot's plate	3.1 Do you have any flower plot's plate in your house? ( ) yes ( ) no [skip to no. 4] 3.2 Do you ever change the water or put sand into the flower plot's plate every week? ( ) usually ( ) sometime ( ) never
4	Water in ant trap	4.1 Do you have any ant trap in your house? ( ) yes ( ) no [skip to no. 5] 4.2 Do you ever change the water, put abate sand or detergent into ant trap every week? ( ) usually ( ) sometime ( ) never
5	Cemented container in toilet	5.1 Do you have any cemented containers in your toilet? ( ) yes ( ) no [skip to no. 6] 5.2 Do you ever examine the mosquito larvae in cemented container in your house? ( ) usually ( ) sometime ( ) never 5.3 If you found the mosquito larvae in cemented container do you ever to clean and get it out? ( ) usually ( ) sometime ( ) never
	Coconut shell,	

6	discarded bottle of can	6.1 Do you have any coconut shell, discarded bottle of can in your house? ( ) yes ( ) no [skip to no. 7]
	Prevention of mosquito bite	6.2 Do you ever examine any discarded thing in your surrounding area in your house? ( ) usually ( ) sometime ( ) never
		6.3 If yes, Do you ever and put them in the garbage? ( ) usually ( ) sometime ( ) never
7	Mosquito net/screen	7.1 Do you have mosquito net or mosquito screen in your house? ( ) yes ( ) no [skip no.8]
8	Insecticide spray and mosquito incense	7.2 Do you and your family members sleep in the mosquito net/screen at day time? ( ) usually ( ) sometime ( ) never
		8.1 Do you have any mosquito insecticide or mosquito incense in your house? ( ) yes ( ) no [skip no.9]
9	Smog spray	8.2 Do you use mosquito insecticide? ( ) usually ( ) sometime ( ) never
		9.1 Does your house have ever been sprayed smog? ( ) yes ( ) no [skip no.10]
		9.2 Does your community have been sprayed smog during epidemic nearby? ( ) usually ( ) sometime ( ) never
10	Dengue hemorrhagic fever campaign	9.3 Spraying smog when there are infected patient in the community. ( ) usually ( ) sometime ( ) never
		10.1 Do you have any campaign of DHF in your house? ( ) yes ( ) no
		10.2 Do you have any campaign of DHF in your community regularly? ( ) usually ( ) sometime ( ) never

Part V: Questionnaire related to Resources for prevention DHF

Instruction: Please check / in front of the statement that you think that it is the correct answer.

Type of sources and statement

1. Mosquito net/screening

1.1 Do everybody in your family members using mosquito net? (If yes, please go through no. 1.2 and 1.3 but if no go through no.2.

( ) Yes ( ) No

1.2. Do your mosquito net are available and in good condition?

( ) Yes ( ) No

1.3 Every time that your mosquito net are destroyed or cannot repaired; you will replace the new one.

( ) Yes ( ) No

2. about storage water container Cover

2.1 Every storage water containers in your house, all are having the cover

( ) Yes ( ) No

2.2 If the storage water container as in 2.1 No Cover or not enough. Do Family leaders are using others kind of prevention such as

(1) Clean the container every week

( ) Yes ( ) No

(2) Putting abate sand

( ) Yes ( ) No

(3) Putting Lavivorous fish

( ) Yes ( ) No

3. Abate sand

3.1 Do you received abate sand from Public health center or not ?

( ) Yes ( ) No

3.1 Abate sands are supported and available for your family using the whole year to prevention of mosquito larvae

( ) Yes ( ) No

3.2 If Abate sands are not available do you use other kinds of prevention such as putting larvivorous fish in your container, clean your container every week or covering your container?

( ) Yes ( ) No

Part VI **Questionnaire related to Information of the Family leader from media in prevention of DHF.**

Portion 1: Questionnaire about the information about prevention and control of DHF among family leaders.

Statement	>1	1 time	never
1. Aedes agypti mosquito is the cause of DHF 2. Even you ever got DHF, you can infect it again 3. Severity of DHF can cause of Death. 4. If you have fever with muscle pain. Paracetamol is the drug of choice. 5. Get rid of the mosquito breeding place such as discarded bottles of cans, coconut shells, and tires. 6. Cover the storage of water containers, clean-up the containers, change the water in every week, put abate sand in every 1-3 month or put the Lavivorous fish. 7. Sleep in the mosquito net / mosquito screen all the time. 8. Know about the outbreak of DHF in your community			

Portion 2: Questionnaire about the distribution of the sources of the information on prevention and control of DHF.

Please check [/] in front of the answer. You can check [/] more than one answer

( ) television	( ) Sometime	( ) Never
( ) Radio	( ) Sometime	( ) Never
( ) village health line	( ) Sometime	( ) Never
( ) Announcement from public health	( ) Sometime	( ) Never
( ) Village health volunteer	( ) Sometime	( ) Never
( ) Newspaper	( ) Sometime	( ) Never
( ) brochure and leaflets	( ) Sometime	( ) Never

( ) Others……

Part VII: Questionnaires related to Supporting and Supervision from health officers.

Instruction: please check / in the following statement.

Question	> 1 time	1 time	Never
1. Inform about DHF causing by Aedes Mosquito 2. Inform by health officer, DHF even ever infected, have a chance to infect again. 3. Prevention of mosquito bite is the best way to prevent DHF 4. Inform, get rid off breeding places in community at the same time will decrease in DHF. 5. Fever with myalgia, paracetamol is drug of choice 6. Inform, sleeping in mosquito net/screening can prevent DHF			

Do you have any problem with the practice in prevention and control of DHF?

( ) No ( ) Yes ……..

Do you want any help or any suggestion in prevention and control of DHF or not?

( ) No ( ) Yes……

เครื่องมือที่ใช้ในการวิจัย

แบบสอบถามงานวิจัยเรื่อง

"ปัจจัยที่สัมพันธ์กับพฤติกรรมป้องกันไข้เลือดออกของหัวหน้าครอบครัว
ในตำบลบ้านช่างหล่อ กรุงเทพมหานคร"

คำชี้แจงในการตอบแบบสอบถาม

แบบสอบถามครั้งนี้มีวัตถุประสงค์เพื่อต้องการทราบข้อมูลทั่วไปและข้อมูลเกี่ยวกับการปฏิบัติในการป้องกันและควบคุมโรคไข้เลือดออกของหัวหน้าครอบครัว

คำตอบที่ได้ จะเป็นความลับและไม่มีผลกระทบต่อตัวหัวหน้าครอบครัวและครอบครัวหรือชุมชนแต่อย่างใด ดังนั้นจึงใคร่ขอให้หัวหน้าครอบครัวตอบคำถามเหล่านี้ตามความเป็นจริงให้มากที่สุด เพราะจะเป็นประโยชน์ในการวางแผนและหาวิธีที่เหมาะสมในการดำเนินงานป้องกันและควบคุมโรคไข้เลือดออกให้ได้ผลดียิ่งขึ้นต่อไป

แบบสอบถามทั้งหมดประกอบด้วย 6 ส่วน

ส่วนที่ 1แบบสอบถามข้อมูลทั่วไป
ส่วนที่ 2แบบสอบถามความรู้เกี่ยวกับโรคไข้เลือดออก
ส่วนที่ 3แบบสอบถามเจตคติต่อโรค และการป้องกันควบคุมโรคไข้เลือดออก
ส่วนที่ 4แบบสอบถามเกี่ยวกับพฤติกรรมการป้องกันและควบคุมโรคไข้เลือดออก
ส่วนที่ 5แบบสอบถามความเพียงพอของทรัพยากรในการป้องกันโรคไข้เลือดออก
ส่วนที่ 6แบบสอบถามการได้รับข้อมูลข่าวสารเกี่ยวกับโรคและการป้องกันควบคุมโรคไข้เลือดออก
ส่วนที่ 7แบบสอบถามการได้รับคำแนะนำและติดตามจากเจ้าหน้าที่สาธารณสุข

ขอขอบคุณทุกท่านที่ให้ความร่วมมือในการตอบแบบสอบถามเป็นอย่างดี

สมชาย ตรีทิพย์สถิตย์
นักศึกษาปริญญาโท สาขา บริหารจัดการสาธารณสุข
สถาบันพัฒนาการสาธารณสุขอาเซียน มหาวิทยาลัยมหิดล

ส่วนที่ 1 แบบสอบถามข้อมูลทั่วไป

คำชี้แจง ขอความร่วมมือหัวหน้าครอบครัวโปรดทำเครื่องหมาย ✓ ลงใน ( ) หน้าข้อความที่ตรงกับความเป็นจริงของท่านในปัจจุบัน และเติมคำลงในช่องว่างให้สมบูรณ์ (กรุณาตอบให้ครบทุกข้อ)

1. เพศ ( ) ชาย ( ) หญิง

2. อายุ ( ) ≤ 24 ( ) 40-44

( ) 25-29 ( ) 45-49

( ) 30-34 ( ) ≥ 50

( ) 35-39

3. สถานภาพ

( ) โสด ( ) สมรส / แยกกันอยู่

( ) สมรส / อยู่ด้วยกัน ( ) ม่าย / หย่าร้าง

4. ศาสนา

( ) พุทธ ( ) มุสลิม

( ) คริสต์ ( ) อื่นๆ

5. รายได้ **(**บาท / เดือน**)**

( ) ≤ 3,000 ( ) 5,001 – 7,000

( ) 3,001 – 5,000 ( ) ≥ 7,001

6. อาชีพ

( ) ว่างงาน ( ) รับจ้าง

( ) ข้าราชการ/รัฐวิสาหกิจ ( ) กรรมกร

( ) แม่บ้าน/พ่อบ้าน ( ) อื่นๆ

7. การศึกษา

( ) ไม่ได้เรียน ( ) อนุปริญญา

( ) ประถมศึกษาปีที่ 1 – 6 ( ) ปริญญาตรีหรือเทียบเท่า

( ) มัธยมศึกษาตอนต้น ( ) สูงกว่าปริญญาตรี

( ) มัธยมศึกษาตอนปลาย

ส่วนที่ 2แบบสอบถามความรู้เกี่ยวกับโรคไข้เลือดออก

คำชี้แจง โปรดทำเครื่องหมาย✓ ลงใน ( ) หน้าข้อความที่ท่านคิดว่าถูกต้องที่สุด

1. ยุงลาย เป็นพาหะของการเกิดโรคไข้เลือดออก

( ) ใช่ ( ) ไม่ใช่ ( ) ไม่ทราบ

2. ยุงที่กัดกินเลือดกลางวัน เป็นสาเหตุของโรคไข้เลือดออก

( ) ใช่ ( ) ไม่ใช่ ( ) ไม่ทราบ

3. ทุกฤดูในประเทศไทยสามารถทำให้เกิดโรคไข้เลือดออกได้ แต่ฤดูฝนจะมีการระบาดของโรคมากที่สุด

( ) ใช่ ( ) ไม่ใช่ ( ) ไม่ทราบ

4. เด็ก เสี่ยงต่อการเกิดโรคไข้เลือดออกมากกว่าผู้ใหญ่

( ) ใช่ ( ) ไม่ใช่ ( ) ไม่ทราบ

5. อาการมีไข้สูงเฉียบพลัน, ปวดเมื่อยกล้ามเนื้อ, และผื่นเลือดออกใต้ผิวหนัง บ่งชี้ว่าอาจเป็นโรคไข้เลือดออก

( ) ใช่ ( ) ไม่ใช่ ( ) ไม่ทราบ

6. เมื่อมีไข้ และสงสัยว่าเป็นไข้เลือดออก สามารถใช้ยาพาราเซตามอลเพื่อลดไข้ได้

( ) ใช่ ( ) ไม่ใช่ ( ) ไม่ทราบ

7. ผู้ป่วยที่เป็นโรคไข้เลือดออก มีโอกาสเสียชีวิตได้

( ) ใช่ ( ) ไม่ใช่ ( ) ไม่ทราบ

8. โรคไข้เลือดออกสามารถป้องกันได้ด้วยวัคซีน

( ) ใช่ ( ) ไม่ใช่ ( ) ไม่ทราบ

9. น้ำขังในห้องน้ำ, แจกัน เป็นแหล่งเพาะพันธ์ยุงลาย

( ) ใช่ ( ) ไม่ใช่ ( ) ไม่ทราบ

10. การนอนในมุ้งหรือมุ้งลวดทุกครั้งจะสามารถป้องกันโรคไข้เลือดออกได้

( ) ใช่ ( ) ไม่ใช่ ( ) ไม่ทราบ

11. การทำความสะอาดภาชนะที่ใส่น้ำทุกสัปดาห์ สามารถลดการแพร่พันธุ์ลูกน้ำได้

( ) ใช่ ( ) ไม่ใช่ ( ) ไม่ทราบ

12. ปลาหางนกยูงสามารถป้องกันไข้เลือดออกได้โดยการกินลูกน้ำตัวแก่และตัวอ่อน

( ) ใช่ ( ) ไม่ใช่ ( ) ไม่ทราบ

ส่วนที่ 3 แบบสอบถามเจตคติต่อโรคและการป้องกันควบคุมโรคไข้เลือดออก

คำชี้แจง โปรดทำเครื่องหมาย ✓ลงในช่องว่างที่ตรงกับ ความคิดเห็น หรือความรู้สึกของท่านมากที่สุดเพียงความเห็นเดียว

ข้อความ	เห็นด้วยอย่างยิ่ง	เห็นด้วย	ไม่แน่ใจ	ไม่เห็นด้วย	ไม่เห็นด้วยอย่างยิ่ง
1. ไข้เลือดออกเป็นโรคที่สามารถป้องกันได้โดยไม่ยุ่งยาก					
2. ท่านเป็นบุคคลสำคัญคนหนึ่งในการป้องกัน และควบคุมโรคไข้เลือดออก					
3. ครอบครัวที่ไม่เคยมีใครป่วยเป็นโรคไข้เลือดออกไม่มีความจำเป็นต้องกำจัดลูกน้ำยุงลาย					
4. ท่านยินดีและเต็มใจให้ความร่วมมือในการรณรงค์กำจัดแหล่งเพาะพันธ์ยุง					
5. การป่วยเป็นโรคไข้เลือดออกเป็นเรื่องธรรมดาเหมือนกับการเป็นโรคไข้หวัด					
6. การดูแลสอดส่องเพื่อหาและกำจัดแหล่งเพาะพันธ์ยุงในชุมชนเป็นภาระหน้าที่ของทุกคน					
7. การกำจัดแหล่งเพาะพันธ์ยุงโดยการล้างภาชนะใส่น้ำทุกสัปดาห์ทำให้เสียเวลาและยุ่งยากมาก					
8. ประโยชน์ของการมีภาชนะใส่น้ำที่มีฝาปิดแน่นจะป้องกันยุงวางไข่ในน้ำ					
9. ที่รองขาตู้ แจกัน เป็นแหล่งเพาะพันธุ์ที่ทำให้เกิดโรคไข้เลือดออก					
10. การปล่อยปลาหางนกยูงเพื่อกินลูกน้ำซึ่งเป็นการกำจัดลูกน้ำที่ประหยัดวิธีหนึ่ง					
11. การพ่นหมอกควันเพียงอย่างเดียวก็เพียงพอสำหรับการกำจัดยุงไม่จำเป็นต้องปฏิบัติวิธีอื่นๆ					
12. การนอนในมุ้งทำให้รู้สึกอึดอัด จึงไม่จำเป็นต้องนอนในมุ้งทุกครั้ง					

ส่วนที่ 4 แบบสอบถามเกี่ยวกับพฤติกรรมการป้องกันและควบคุมโรคไข้เลือดออก

คำชี้แจง โปรดทำเครื่องหมาย ✓ ลงในช่อง ( ) ตามความเป็นจริง

ข้อ	ข้อความ	การปฏิบัติ
1	<u>ประเภทภาชนะและการกำจัดตัวอ่อน</u> ตุ่มน้ำดื่มน้ำใช้	1.1 ที่บ้านของท่านมีตุ่มน้ำดื่มน้ำใช้หรือไม่ ( ) มี ( ) ไม่มี [ข้ามไปข้อ 2] 1.2 ท่านเคยปิดโอ่งน้ำทันทีหลังจากใช้น้ำหรือไม่ ( ) เคยเป็นประจำ ( ) เคยบางครั้ง ( ) ไม่เคยเลย 1.3 ท่านเคยสำรวจลูกน้ำยุงลายในตุ่มน้ำหรือไม่ ( ) เคยเป็นประจำ ( ) เคยบางครั้ง ( ) ไม่เคยเลย 1.4 ถ้าพบลูกน้ำท่านเคยตักลูกน้ำหรือใส่ทรายอะเบทในภาชนะดังกล่าวหรือไม่ ( ) เคยเป็นประจำ ( ) เคยบางครั้ง ( ) ไม่เคยเลย
2	น้ำในแจกันดอกไม้ในบ้าน	2.1 ที่บ้านของท่านมีภาชนะแจกันใส่ดอกไม้หรือไม่ ( ) มี ( ) ไม่มี [ข้ามไปข้อ 3] 2.2 ท่านเปลี่ยนน้ำในแจกันที่บ้านทุกสัปดาห์ ( ) เคยเป็นประจำ ( ) เคยบางครั้ง ( ) ไม่เคยเลย
3	น้ำในจานรองกระถางต้นไม้	3.1 ที่บ้านของท่านมีจานรองกระถางต้นไม้หรือไม่ ( ) มี ( ) ไม่มี [ข้ามไปข้อ 4] 3.2 ท่านเปลี่ยนน้ำหรือใส่ทรายในจานรองกระถางต้นไม้ที่บ้านทุกสัปดาห์ ( ) เคยเป็นประจำ ( ) เคยบางครั้ง ( ) ไม่เคยเลย
4	น้ำในจานรองขาตู้กับข้าว	4.1 ที่บ้านของท่านมีจานรองตู้กับข้าวใส่น้ำไว้หรือไม่ ( ) มี ( ) ไม่มี [ข้ามไปข้อ 5] 4.2 ท่านเปลี่ยนน้ำใส่น้ำส้มสายชูหรือผงซักฟอกในจานรองขาตู้กับข้าวทุกสัปดาห์ ( ) เคยเป็นประจำ ( ) เคยบางครั้ง ( ) ไม่เคยเลย
5	ตุ่มน้ำ อ่างน้ำ ในห้องน้ำห้องส้วม	5.1 ที่บ้านของท่านมีตุ่มน้ำ อ่างน้ำ ในห้องน้ำห้องส้วมหรือไม่ ( ) มี ( ) ไม่มี [ข้ามไปข้อ 6] 5.2 ท่านเคยสำรวจลูกน้ำยุงลายในตุ่มน้ำ อ่างน้ำในห้องน้ำห้องส้วมในบ้านหรือไม่ ( ) เคย ( ) เคยบางครั้ง ( ) ไม่เคยเลย 5.3 ถ้าพบลูกน้ำ ท่านเคยตักทิ้งหรือทำความสะอาดภาชนะดังกล่าวหรือไม่ ( ) เคยเป็นประจำ ( ) เคยบางครั้ง ( ) ไม่เคยเลย

ข้อ	ข้อความ	การปฏิบัติ
6	กะลา กระป๋อง และเศษวัสดุเหลือใช้ที่น้ำขังได้	6.1 ที่บ้านของท่านมีกะลา กระป๋อง และเศษวัสดุเหลือใช้ที่ขังน้ำได้หรือไม่ ( ) มี ( ) ไม่มี [ข้ามไปข้อ 7] 6.2 ท่านเคยสำรวจวัสดุดังกล่าวรอบบริเวณบ้านหรือไม่ ( ) เคยเป็นประจำ ( ) เคยบางครั้ง ( ) ไม่เคยเลย 6.3 ถ้าเคย ท่านเคยเก็บกวาดหรือนำไปทิ้งถังขยะ ( ) เคยเป็นประจำ ( ) เคยบางครั้ง ( ) ไม่เคยเลย
	<u>การป้องกันยุงลายกัด</u>	
7	มุ้ง และมุ้งลวด	7.1 ที่บ้านของท่าน มีมุ้งหรือมุ้งลวดหรือไม่ มุ้ง ( ) มี ( ) ไม่มี มุ้งลวด ( ) มี ( ) ไม่มี 7.2 ท่านและสมาชิกในครอบครัวนอนกลางวันในมุ้งลวดหรือมุ้งผ้าหรือไม่ ( ) เคยเป็นประจำ ( ) เคยบางครั้ง ( ) ไม่เคยเลย
8	ยาฉีดยุง หรือ ยาจุดกันยุง	8.1 ที่บ้านของท่าน มียาฉีดยุงหรือยาจุดกันยุงหรือไม่ ( ) มี ( ) ไม่มี [ข้ามไปข้อ 9] 8.2 ท่านใช้ยาจุดกันยุงหรือยาฉีดยุงหรือไม่ ( ) เคยเป็นประจำ ( ) เคยบางครั้ง ( ) ไม่เคยเลย
9	การพ่นหมอกควัน	9.1 ที่บ้านของท่านมีการพ่นหมอกควันหรือไม่ ( ) มี ( ) ไม่มี [ข้ามไปข้อ 10] 9.2 การพ่นหมอกควันในชุมชนเมื่อมีการระบาดในชุมชนใกล้เคียง ( ) เคยเป็นประจำ ( ) เคยบางครั้ง ( ) ไม่เคยเลย 9.3 การพ่นหมอกควันเมื่อมีผู้ป่วยในชุมชน ( ) เคยเป็นประจำ ( ) เคยบางครั้ง ( ) ไม่เคยเลย
10	รณรงค์ไข้เลือดออก	10.1 ที่บ้านของท่านมีการรณรงค์ไข้เลือดออกหรือไม่ ( ) มี ( ) ไม่มี 10.2 มีการรณรงค์ไข้เลือดออกในชุมชนของท่านอยู่สม่ำเสมอ ( ) เคยเป็นประจำ ( ) เคยบางครั้ง ( ) ไม่เคยเลย

ส่วนที่ 5 แบบสอบถามความเพียงพอของทรัพยากรในการป้องกันและควบคุมโรคไข้เลือดออก

คำชี้แจง โปรดเลือกตอบโดยทำเครื่องหมาย ✓ ลงใน ( ) ท้ายข้อความทุกข้อตามความเป็นจริง เกี่ยวกับการมีหรือการได้รับการสนับสนุนหรือการจัดหาทรัพยากรที่จำเป็นในการป้องกันและควบคุมโรคไข้เลือดออก

ประเภทของทรัพยากร / ข้อความ

1. มุ้ง หรือมุ้งลวด

1.1 ที่บ้านของท่านมีมุ้งลวดหรือใช้มุ้งผ้ากางนอนเพื่อป้องกันยุงหรือไม่ (ถ้าตอบว่าใช่ ให้ทำข้อ 1.2 และ 1.3 แต่ถ้าตอบว่าไม่ใช่ให้ข้ามไปทำข้อ 2)

( ) ใช่ ( ) ไม่ใช่

1.2 มุ้งที่ใช้ยังอยู่ในสภาพดี ไม่ขาด หรือ ชำรุดมาก

( ) ใช่ ( ) ไม่ใช่

1.3 ทุกครั้งที่มุ้งชำรุดหรือขาดจนซ่อมแซมไม่ได้ จะได้รับการจัดหาให้ใหม่ทุกครั้ง

( ) ใช่ ( ) ไม่ใช่

2. ฝาปิดโอ่งน้ำ หรือฝาปิดภาชนะเก็บกักน้ำ

1.4 โอ่งน้ำหรือภาชนะเก็บน้ำใช้ที่บ้าน มีฝาปิดครบทุกใบ

( ) ใช่ ( ) ไม่ใช่

1.5 ถ้าภาชนะตามข้อ 2.1 ไม่มีฝาปิดหรือมีไม่ครบ หัวหน้าครอบครัว มีการป้องกันควบคุมและกำจัดลูกน้ำยุงโดยวิธีใดวิธีหนึ่งต่อไปนี้หรือไม่

(1) การล้างภาชนะทุกสัปดาห์

( ) ใช่ ( ) ไม่ใช่

(2) ใส่ทรายอะเบท

( ) ใช่ ( ) ไม่ใช่

(3) การปล่อยปลาหางนกยูง

( ) ใช่ ( ) ไม่ใช่

3. ทรายอะเบท

1.6 ท่านได้รับทรายอะเบทจากศูนย์บริการสาธารณสุขหรือไม่

( ) ได้ ( ) ไม่ได้

1.7 ทรายอะเบทที่ได้รับสนับสนุนหรือมีอยู่ที่บ้านเพียงพอสำหรับใช้ตลอดทั้งปี

( ) ใช่ ( ) ไม่ใช่

3.3 ถ้ามีไม่เพียงพอได้มีการใช้วิธีใดวิธีหนึ่งในการป้องกันและกำจัดลูกน้ำยุง ได้แก่ การล้างภาชนะ หรือการปล่อยปลาหางนกยูง หรือการปิดฝาภาชนะเหล่านั้น

( ) ใช่ ( ) ไม่ใช่

ส่วนที่ 6 แบบสอบถามการได้รับข้อมูลเกี่ยวกับโรคและการป้องกันควบคุมโรคไข้เลือดออก

ตอนที่ **1** แบบสอบถามการได้รับข้อมูลข่าวสารเกี่ยวกับโรคและการป้องกันควบคุมโรคของหัวหน้าครอบครัว

คำชี้แจง โปรดทำเครื่องหมาย ✓ ลงในช่องท้ายข้อความแต่ละข้อความตามความเป็นจริง

ข้อความ	มากกว่า **1** ครั้ง	**1** ครั้ง	ไม่เคยได้รับ
1. ยุงลายเป็นสาเหตุของโรคไข้เลือดออก			
2. ถึงแม้ว่าเคยเป็นไข้เลือดออกท่านก็สามารถเป็นอีกได้			
3. เป็นโรคไข้เลือดออกสามารถเสียชีวิตได้			
4. ถ้ามีไข้ ปวดเมื่อย ยาพาราเซตามอลเป็นยาที่ใช้เท่านั้น			
5. ทำลายแหล่งเพาะพันธ์ยุงลาย เช่น ขวด กระป๋อง กะลามะพร้าว ยางเก่า			
6. ปิดฝาภาชนะที่ใส่น้ำ หรือทำความสะอาดภาชนะที่เก็บน้ำ ทุกสัปดาห์ หรือใส่ทรายอะเบททุก 1-3 เดือน หรือปลาหางนกยูง			
7. นอนในมุ้งหรือมุ้งลวดทุกเวลา			
8. ทราบข้อมูลเกี่ยวกับการระบาดของไข้เลือดออกในชุมชนของท่าน			

ตอนที่ 2 แบบสอบถามการกระจายของการได้รับข้อมูลข่าวสารจากแหล่งต่างๆ เกี่ยวกับโรคและการป้องกันควบคุมโรคไข้เลือดออก

คำชี้แจง กรุณาเขียนเครื่องหมาย ✓ หน้าคำตอบ (สามารถตอบได้มากกว่า 1 คำตอบ)

แหล่งข้อมูล

( ) โทรทัศน์

( ) วิทยุ

( ) เสียงตามสายในหมู่บ้าน

( ) ประกาศจากสาธารณสุข

( ) อาสาสมัครสาธารณสุขชุมชน

( ) หนังสือพิมพ์

( ) แผ่นพับหรือใบปลิว

( ) อื่นๆ .....

ส่วนที่ 7 แบบสอบถามการแนะนำและติดตามจากเจ้าหน้าที่สาธารณสุข

คำชี้แจง ให้หัวหน้าครอบครัวทำเครื่องหมาย ✓ ลงในช่องท้ายข้อความแต่ละข้อความตามความเป็นจริง

ข้อความ	มากกว่า **1** ครั้ง	**1** ครั้ง	ไม่เคยได้รับ
1. ได้รับการแนะนำว่าไข้เลือดออกเกิดจากยุงลาย 2. ได้รับการแนะนำจากเจ้าหน้าที่สาธารณสุขว่าเคยเป็นไข้เลือดออกสามารถเป็นอีกได้ 3. การป้องกันยุงกัดเป็นวิธีที่ดีที่สุด ไม่ให้เกิดไข้เลือดออก 4. ได้รับการแนะนำจากเจ้าหน้าที่สาธารณสุขในการกำจัดแหล่งเพาะพันธ์ยุงในชุมชนของท่านพร้อมกันจะช่วยลดจำนวนการเกิดไข้เลือดออก 5. เมื่อมีไข้ ปวดเมื่อย ยาพาราเซตามอลเป็ฯยานิยมใช้ 6. ได้รับการแนะนำว่าการนอนในมุ้งหรือมุ้งลวดสามารถป้องกันไข้เลือดออกได้			

BIOGRAPHY

NAME	Somchai Teetipsatit
DATE OF BIRTH	March 19, 1961
PLACE OF BIRTH	Udonthani Thailand
INSTITUTION ATTENDED	Devine Word University, College of Medicine Tacloban city, Phillippines, 1979-1985 Doctor of Medicine. Dip. Thai Board of Otolaryngology, 1999 Dip. Thai Board of Family Doctor, 2001
FELLOWSHIP/	Japan International Cooperation Agency, Thailand International Development Cooperation Agency (JICA/TICA)
RESEARCH GRANT	Supported in part by the Research Grant, TICA/JICA
PRESENT POSITION	Otolaryngologist, Family Doctor Acting Director Public Health Center 48 40/1 Liab khong pasrichareon neua Nong khaem, Bangkok, Thailand