

CHAPTER III

RESEARCH METHODOLOGY

1. Study design

This study design was a cross-sectional analytical study. The goals were to characterize preventive behaviors against dengue infection of Family Health Leaders (dependent variables), and to assess relationships of these behaviors with socio-demographic/predisposing, enabling, and reinforcing factors (independent variables).

2. Study population

The population of this study was FHLs who live in Kongkrait District, Sukhothai Province for at least 1 year, were willing to participate in the study, gave informed consent, and were not ill or otherwise unable to answer the questions.

Kongkrait is a district in Sukhothai Province, Northern Region of Thailand, 22 kilometers away from Maung Sukhothai. It occupies a total area of 502 square kilometers and is administratively divided into eleven tambol. In the year 2005, the population is estimate to be 66,896 people. There are 108 villages, 10,880 households, 875 health volunteers, and 9,464 FHLs ($9,464/10,880 = 87.0\%$ of households have FHLs). There are 15 health centers and 1 community hospital. An individual health center and hospital serves about 3 to 11 villages each (Kongkrait Health Office, 2005).

3. The sample size calculation

Several previous studies have evaluated prevention and control behaviors against dengue fever. I summarized findings of such studies in Tables 1 and 2. I also calculated sample sizes that would be necessary to detect observed behavior differences in these studies, with 95% confidence and 80% power. I made these calculations with Epi Info, Statcalc, Sample size and power, Cohort or cross-sectional option (Fleiss, 1981). These sample size calculations were also included in Tables 1 and 2 below.

Table 1: Association of knowledge with dengue preventive behavior in Thailand

Knowledge and study	Behavior (%)		Sample size calculation from Study results (outcome = good behavior) *		
	Not good	Good	Lower knowledge	Higher knowledge	Total
<u>Phiraphol Chusongsang</u> ¹					
Higher	67.3	32.7	68	68	136
Lower	88.5	11.5			
<u>Somchai Teetipsatit</u> ²					
Good	75.0	25.0	706	706	1412
Moderate / Low	81.3	18.7			
<u>Sanya Kittisoontaropas</u> ³					
Good	10.0	90.0	198	198	396
Needs for improvement	20.6	79.4			

¹From table 12 in thesis, 2005 (author's sample size was 350 subjects)

²From table 22 in thesis, 2005 (author's sample size was 414 subjects)

³From table 17 in thesis, 2004 (author's sample size was 640 subjects)

*Sample size calculation from study results (outcome = observed percentage with good behavior). Subjects with higher and lower knowledge were considered to

be the exposed and control groups, respectively. The calculations were made assuming equal numbers in the exposed and control groups.

Table 2: Association of attitude with dengue preventive behavior in Thailand

Attitude and study	Behavior (%)		Sample size calculation from study results (outcome = good behavior) *		
	Not good	Good	Poorer Attitude	Better Attitude	Total
<u>Phiraphol Chusongsang</u> ¹					
Favorable	80.2	19.8	350	350	700
Unfavorable	88.2	11.8			
<u>Somchai Teetipsatit</u> ²					
Good	78.9	21.1	184	184	368
Moderate / Low	90.0	10.0			
<u>Hmwe Hmwe Kyu</u> ³					
Good	57.6	42.4	109	109	218
Moderate / Poor	76.3	23.7			

¹From table 12 in thesis, 2005 (author's sample size was 350 subjects)

²From table 23 in thesis, 2005 (author's sample size was 414 subjects)

³From table 20 in thesis, 2003 (author's sample size was 307 subjects)

*Sample size calculation from study results (outcome = observed percentage with good behavior). Subjects with better and poorer attitude were considered to be the exposed and control groups, respectively. The calculations were made assuming equal numbers in the relatively exposed and unexposed (control) groups.

According to Table 1 (studies about knowledge associated with dengue preventive behavior), the total sample size from calculate in Epi Info are 136, 1412, and 396. According to Table 2 (studies about attitude associated with dengue

preventive behavior), the total sample size from calculate in Epi Info are 700, 368, and 218. In my study I selected a sample size of 450 subjects. This is sufficient to detect most of the differences observed in previous studies, at $\alpha = 0.05$ (95% confidence) and power = 80%.

4. Sampling method

This researcher, accompanied by public health officers and village health volunteers, collected the data by multi-stage sampling. The procedure included the following steps:

Step 1: Selected every health center and hospital in Kongkrait District, Sukhothai Province. (15 health centers and 1 hospital)

Step 2: For each health center and hospital, randomly selected one village from all villages under the responsibility (catchment area) by drawing a raffle. This was yield 16 villages in all.

Step 3: Calculated the proportion of FHLs of each village per total number of FHLs in the selected 16 villages by the following formula:

Proportion of FHLs in each village =

$$\frac{\text{Total number of FHLs in each village}}{\text{Total number of FHLs in all 16 villages}}$$

Next I calculated the sample size in each village by using the total sample size (450) multiplied by proportion of FHLs in each village, as shown in Table 3.

Table 3: Number of sample size in each village.

Village name	No. of FHLs (a)	Proportion (b) (a / 2482)	Sample size (b × 450)
Klongyaiinee	131	0.053	24
Wangpa	136	0.055	25
Padutao	105	0.042	19
Watbod	110	0.044	20
Banklang	202	0.081	36
Klongwangthong	88	0.035	16
Nongbua	161	0.065	29
Nongkrathum	205	0.083	37
Dongyang	131	0.053	24
Nongtao	156	0.063	28
Pakruk	166	0.067	30
Kokrat	219	0.088	40
Klongyang	188	0.076	34
Nongmaelon	75	0.030	14
Kuysamo	168	0.067	30
Maisukkasem	241	0.097	44
Total	2,482	1.000	450

Step 4: Used data record from family folder in each health center to select the FHLs, in the same proportion as calculated for step 3, above. (List frame)

Step 5: Interviewed the family health leaders (FHLs) in every selected household. If the selected FHLs was not at home, I selected the home next door from which to select the household FHL.

5. Research instrument and measurement

I used a standardized, pre-tested questionnaire that consisted of six parts as detailed below.

Part 1: Socio-demographic characteristics: gender, age, marital status, education level, occupation, household income, duration of living in Kongkrait District, family size, and dengue infection history.

Part 2: The knowledge about dengue infection, including signs and symptoms, mosquito vector, transmission, treatment and care, and prevention of dengue infection. There were 15 questions in this part and each question had 3 choices, true, false, and unknown. A correct answer was given 1 score and 0 score was given for a wrong answer and unknown. The scores varied from 0 to 15 points and were classified into 3 levels as follows: (Bloom's cut off point, 60-80%)

- High level (80 – 100%) (12 –15 scores)
- Moderate level (60 – 79%) (9 – 11 scores)
- Low level (0 –59%) (0 – 8 scores)

Part 3: Attitude towards dengue infection in the aspect of prevention. The statement in this part concerned beliefs and feelings of the FHLs. There were 15 statements in both positive and negative statements. The positive statements were questions # 3, 9, 11, and 13. The negative statements were questions # 1, 2, 4, 5, 6, 7, 8, 10, 12, 14, and 15. The rating scale measurement as 3 ratings as follows.

Positive statement		Negative statement	
Choice	scores	Choice	scores
Agree	3	Agree	1
Uncertain	2	Uncertain	2
Disagree	1	Disagree	3

The scores varied from 15 to 45, and were classified into 3 levels as follows: (cut point use cumulative percent 20% for poor level, 40% for fair level, and 40% for good level)

-	Good level	(41 - 45 scores)
-	Fair level	(36 – 40 scores)
-	Poor level	(15 - 35 scores)

Part 4: Preventive behaviors against dengue infection

This part had 16 items. For several items, many subjects responded "Do not have." In such items sample sizes were too small to allow meaningful, representative analysis of behavior in relation to independent variables. Therefore, in this study was analyzed only 8 items (item 1, 2, and 7 as controlling breeding places; item 11, 13, and 14 as prevention of mosquito bite; and item 15, and 16 as participation in community-level activities in prevention of dengue infection).

1. Controlling breeding places for 3 items (1, 2, and 7) as drinking water jar, utility water jar, and cement tanks in bathroom. The criteria for scoring the question were:

Item 1 drinking water jars (maximum possible score 16). In each sub-item criteria score was always = 2 points, sometimes = 1 point, and never = 0 points.

- Do you cover drinking water jar after using immediately?
- Do you ever examine the mosquito larvae in drinking water jars?
- Do you ever put abate sand in drinking water jars?
- Do you ever put other that can kill mosquito larvae in drinking water jar?

- If there is a mosquito larvae, do you remove it?
- If there is a mosquito larvae, do you change water and clean jar?
- If there is a mosquito larvae, do you put temephos sand?
- If there is a mosquito larvae, do you put other subject that can kill mosquito larvae?

Item 2 utility water jars (maximum possible score 16). In each sub-item criteria score was always = 2, sometimes = 1, and never = 0.

- Do you cover utility water jar after using immediately?
- Do you ever examine the mosquito larvae in utility water jars?
- Do you ever put abate sand in utility water jars?
- Do you ever put other that can kill mosquito larvae in utility water jar?
- If there is a mosquito larvae, do you remove it?
- If there is a mosquito larvae, do you change water and clean jar?
- If there is a mosquito larvae, do you put temephos sand?
- If there is a mosquito larvae, do you put other subject that can kill mosquito larvae?

Item 7 Water tanks in bathroom (maximum possible score 16). In each sub-item criteria score was always = 2, sometimes = 1, and never = 0.

- Do you ever examine the mosquito larvae in water tanks in the bathroom?
- Do you ever put abate sand in water tanks in the bathroom?
- Do you ever put other that can kill mosquito larvae in water tanks in the bathroom?

- If there is a mosquito larvae, do you remove it?
- If there is a mosquito larvae, do you change water and clean it?
- If there is a mosquito larvae, do you put temephos sand?
- If there is a mosquito larvae, do you put fish that can eat mosquito larvae?
- If there is a mosquito larvae, do you put other subject that can kill mosquito larvae?

The score in preventive behaviors against dengue infection of the respondents varied from 0 to 48 points, and were classified into 3 levels as follow: (cut point use cumulative percent 40% for poor level, 30% for fair level, and 30% for good level)

-	Good level	(≥ 25 points)
-	Fair level	(21 – 24 points)
-	Poor level	(≤ 20 points)

2. Prevention of mosquito bite for 3 items (11, 13, and 14) as use net in the daytime, use insecticide spray, and use mosquito coil. These 3 items were all assessed as zero-one indicator (dummy) variables. These variables were given value zero for "no" (relatively poor preventive behaviors) and value 1 for "yes" (relatively good preventive behaviors).

Item 11 use net in the daytime

Use	=	relatively good preventive behavior
Not use	=	relatively poor preventive behavior

Item 13 use insecticide spray

Use = relatively good preventive behavior

Not use = relatively poor preventive behavior

Item 14 use mosquito coil

Use = relatively good preventive behavior

Not use = relatively poor preventive behavior

3. Participation in community-level activities in prevention of dengue infection for 2 items (15, and 16) as fogging spray and campaign. These 2 items were all assessed as zero-one indicator (dummy) variables. These variables were given value zero for "no" (relatively poor preventive behavior) and value 1 for "yes" (relatively good preventive behavior).

Item 15 fogging spray in your community or nearby community

Always participate = relatively good preventive behavior

Do not always participate = relatively poor preventive behavior

Item 16 community-level campaign in dengue prevention

Always participate = relatively good preventive behavior

Do not always participate = relatively poor preventive behavior

Part 5: Sufficiency of resources for prevention of dengue infection.

The questionnaire ascertained sufficiency of household resources for prevention of dengue infection. This part consists of 4 items about the following resources:

1. mosquito net/mosquito screening

Sufficiency meant; the respondents had adequate mosquito net/mosquito screening, which were in good condition all for everybody in the family.

Insufficiency meant; the respondents did not have adequate mosquito net/mosquito screening, which were in good condition all for everybody in the family.

2. Cover for water containers

Sufficiency meant; the respondents had covers for all water jars and water containers.

Insufficiency meant; the respondents did not have covers for all water jars and water containers.

3. Abate sand

Sufficiency meant; the respondents had enough abate sand to use throughout the year for elimination of mosquito larvae.

Insufficiency meant; the respondents did not have enough abate sand to use throughout the year for elimination of mosquito larvae.

4. Other resources as citronella, ucaliptus, turmeric, fish, rynumjert, giant mosquito larvae, water bug, water insect, kaffir lime, and other that can prevent and control mosquito.

Sufficiency meant; the respondents used resources in area at least one resource for preventive and control mosquito.

Insufficiency meant; the respondents did not use resources in area for preventive and control mosquito.

Part 6: Receiving information of FHLs from mass media or person on prevention of dengue infection (in the last year).

Portion 1 The questionnaire about the information that related to the frequency of receiving information regarding prevention and control of dengue infection from other kind of media and person. The rating scale had 3 choices selected only one as follow:

Choices	Scores
More than 1 time	= 2
Only 1 time	= 1
Never	= 0

There were 20 items. The scores were ranged from 0 – 40 scores and divided into 3 levels as follow (cut point use cumulative percent 25% for low level, 40% for moderate level, and 35% for high level)

- High level	(36 - 40 points)
- Moderate level	(31 - 35 points)
- Low level	(15 – 30 points)

Portion 2 The questionnaire related to the number of sources of information that received information about the disease and prevention and control of dengue infection. The respondents can be selected more than one answer. The number of sources were ranged from 1 – 9 sources and divided onto 3 levels as follow

- High sources	(8 – 9 sources)
- Moderate sources	(5 – 7 sources)
- Low sources	(1 – 4 sources)

6. Validity and Reliability

The study questionnaire was developed largely from questionnaires used in previous studies of dengue-related behaviors in Thailand. Content validity test for the developed questionnaire done by 3 persons: advisor, chairperson and expert in dengue infection from MoPH. After revising according to suggestion and comment from the panel of expert, advisor, and chairperson. The questionnaire was field tested for reliability before the actual data collection was begun, with 30 FHLs in Banfagklong, Tambon Krainok, Kongkrait District, Sukhothai Province, if pilot subjects did not understand some words, researcher would change them to clarified for the final version. This village was selected as it was not included in the full-scale study. The instrument used Cronbach's Alpha Coefficient for test reliability; the result was 0.7939 in part knowledge and 0.8051 for attitude.

7. Data collection

Data collection process of this research had the details as follow:

1. The researcher introduced himself and presented a letter from the College of Public Health, Chulalongkorn University, to the chief of Kongkrait District Health Office, Kongkrait District, Sukhothai Province, explained and informed the objectives of this study and details of data collection procedure as well as for cooperation in collecting the data.

2. The researcher had meeting with head of health centers, during which he explained and informed the objectives of this study and details of data collection procedure as well as for cooperation in collecting the data and sat date and time to collect the data.

3. Researcher trained the assistants to use the questionnaire on a one-day conference.

4. Data collection among FHLs were collected every day from 8.00 a.m. to 7.00 p.m. from March March 8 - 25, 2006 after being informed and signed on consent form.

8. Data analysis

After collection the data, all items were coded and analyzed by using SPSS program and set a significance level (critical level) at $\alpha = 0.05$. P-values between 0.05 and 0.10 were considered marginally statistically significant. The data were analyzed by the following techniques:

1. Descriptive Statistics: Socio-demographic data of the Family Health Leaders such as gender, age, marital status, predisposing factors, enabling factors, reinforcing factors, and preventive behaviors against dengue infection were analyzed on frequency, percentage, mean, standard deviation, maximum, and minimum.

2. Inferential Statistics: Chi-square test and correlation coefficient were calculated to find out the association between socio-demographic, knowledge, attitude, sufficient of resources for prevention of dengue infection, receiving information about dengue infection and preventive behaviors on dengue infection among Family Health Leaders. (The category "predisposing factors" included sociodemographic characteristics, as well as knowledge and attitude regarding dengue infection. Thus, there were many specific variables in this category. In view of this,

Chapter IV contains separate sections for analyses of sociodemographic factors, and for analyses of knowledge and attitude, in relation to dependent variables.)