

CHAPTER V

CONCLUSIONS, DISCUSSION AND RECOMMENDATIONS

This study was a cross-sectional analytical study aiming to characterize preventive behaviors against dengue infection of Family Health Leaders in Kongkrait District, Sukhothai Province, and to assess associations of these behaviors (dependent variables) with socio-demographic/predisposing, enabling, and reinforcing factors (independent variables). The study population was 450 Family Health Leaders, selected by multi-stage probability sampling. Face to face interviews were conducted to collect the data, using standardized questionnaires. In the analytical portion, which included 412 respondents with no missing data for analyzed dependent variables, chi-square statistics and Pearson's product-moment correlation coefficients were calculated to test for associations between preventive behaviors against dengue infection and socio-demographic/predisposing factors (gender, age, marital status, education, occupation, household income, duration of stay in area, family size, dengue history, knowledge, and attitude), enabling factors (the sufficiency of the resources for prevention of dengue infection), and reinforcing factors (receiving information from media or person).

1. Summary of findings

Most respondents were married and living together (78.2%). The majority were educated at primary school (82.9%) and were in agricultural occupations

(63.3%). The average of household income was 5,189 baht per month. 10.4% of families had experienced dengue infection. More than half of them had knowledge of dengue prevention at moderate level (55.6 %). Most of respondents had fair level of attitude toward prevention and control of dengue infection (41.5%). All of them had mosquito nets in good condition, 33.8% had covered water container, 82.0% had temephos sand enough through year, and 63.8% used other preventive resources. Most of them received information at moderate level (39.1%). Nearly all of them received information from village health volunteer (97.8%), health officer (97.6%), and television (83.6%). Many of them had a relatively poor level of preventive behaviors 42.2% in controlling breeding. More than half of them used mosquito coil (61.7) and the majority always cooperated in community-level fogging spray (91.5%), and campaign (68.7%).

The statistically significant or marginally significant associations between socio-demographic/predisposing factors, enabling factors, and reinforcing factors with preventive behaviors against dengue infection are summarized in Table 46 and Table 47. These tables present directions of associations and p-values.

Table 46: Association between Socio-demographic factors and any preventive behaviors

Demographic factors	Direction and p-value				
	Breeding Place	Prevention of mosquito bite			Community-level cooperation
	Prevention	Daytime net use	Use spray	Use coil	Fogging Campaign
Gender		Males higher		Females higher	
		0.007		0.036	
Age					
Marital status	* 0.059	* 0.094			
Education		Positive		Positive	
		0.058		0.043	
Occupation	† 0.062				
Household income		Positive	Positive	Positive	
		0.001	0.003	0.005	
Family size		‡ 0.005		‡ 0.096	
Dengue history					

* Poorer behavior in separated/divorced/widowed subjects.

† Better behavior in agricultural occupations.

‡ Better behavior in larger families.

Table 47: Association between predisposing, enabling, and reinforcing factors and any preventive behaviors

Factors	Direction and p-value					
	Breeding Place	Prevention of mosquito bite			Community-level cooperation	
	Prevention	Daytime net use	Use spray	Use coil	Fogging	Campaign
Predisposing						
Knowledge	Positive 0.051	Positive 0.094	Positive 0.037		Positive 0.078	
Attitude		Positive 0.032	Positive 0.082	Positive 0.073	Positive 0.058	Positive <0.001
Enabling						
Water covers	Positive 0.017	Positive 0.058	Positive 0.094			
Temephos sand						
Other resources	Positive 0.046			Positive <0.001		Positive 0.003
Reinforcing (information)						
Frequency	Positive <0.001		Positive 0.100	Positive 0.024	Positive <0.001	Positive 0.022
No. of sources	Positive <0.001				Positive 0.043	Positive <0.001

Table 47 shows that statistically significant and marginally significant associations of predisposing, enabling, and reinforcing factors with preventive behaviors were always positive. This finding suggests that strengthening these factors through education, training, and information would be helpful in improving

preventive behaviors against dengue infection. Findings in tables 46 and 47 are summarized more generally in table 48.

Table 48: Statistically significant or marginally significant associations between independent and dependent variables

Factors	Significant or marginally significant association		
	Breeding place prevention	Bite prevention	Community-level cooperation
Demographics			
Gender		X	
Marital status	X	X	
Education		X	
Occupation	X		
Income		X	
Family size		X	
Predisposing			
Knowledge	X	X	
Attitude		X	X
Enabling			
Water covers	X	X	
Other resources	X	X	X
Reinforcing			
Information frequency	X	X	X
Information sources	X		X

2. Discussion of the Results

2.1 Socio-demographic characteristics of respondents

Gender showed no significant association with breeding place prevention or with community-level cooperation. The similar result was found in the study of Somchai Teetipsatit (2005) that male and female of household leaders no relationship with preventive behavior on dengue hemorrhagic fever. Also, Ratchanee Putkuntod and Tanin Suteeprasert (2002) observed that practice did not differ between genders. In the present study found that separated/widowed/divorced group had poorer preventive behaviors against dengue infection than others groups. Possibly this group had increased stress; therefore they could have paid less attention in controlling breeding places. Public health officers and trainers could consider devoting special effort to this group. There was a relationship between education and preventive behavior. This result is consistent with the study of Ratchanee Putkuntod and Tanin Suteeprasert (2002) found that education level was related to the preventive behavior on acute dengue fever. In Kongrailat, income was also associated with preventive behavior. This result is consistent with the study of Phiraphol Chusongsang (2005), who found that household leaders who received income higher than 5,000 baht/month had better preventive and control behaviors on DHF than those who received lower income. However, there was no relationship between age and preventive behavior in Kongrailat. This result is not consistent with the result of Ratchanee Putkuntod and Tanin Suteeprasert (2002) in which there was association between age and preventive behavior on acute dengue fever. In this study, there was no association of dengue history with preventive behavior; therefore dengue history is not likely to be an important confounding factor in analyses of other variables.

2.2 Knowledge about dengue infection

Among Family Health Leaders, knowledge had significant positive association with preventive behaviors against dengue infection in controlling breeding places. This result is consistent with the study of B.H.B. van Benthem et al. (2002), who found that persons with knowledge of dengue reported a significantly higher use of prevention measures than persons without knowledge of dengue. It is also consistent with the study of Sanya Kittisoontaropas (2003), who found that the household heads who had more knowledge on dengue fever would have better preventive behavior and the study of Pornpimol Pongngern (1994) found that the relationship between knowledge and practice was significant. The reason might be they had accessed information of dengue infection from public health officer, and village health volunteers and these were the basic knowledge that public health officers always presented every time that they met people in community. However, this result is not consistent with the result of Hairi et al. (2003) knowledge, attitude and practices (KAP) on dengue in Malaysia and found that there was no significant association between knowledge and practice on dengue.

Overall, the respondents had knowledge at moderate level on dengue infection. Health education programs are necessary to help them improving their knowledge. 24.2 % of respondents did not know the volume of temephos sand to put in the water jar, therefore public health officers should attend in this point because if Family Health Leaders use less than the recommended amount, it is not effective in control the mosquito larvae and sub lethal dose may gradually initiate chemical resistance in subsequent generations of mosquito. Conversely, if they use more than the

recommended amount, it would waste money because temephos sand is very expensive. 45.1% of them did not know everybody can get dengue infection not only children and teenagers: it might be adult less attend avoid mosquito bite and less attend in preventive behavior against dengue infection. Nearly half of them did not know that dengue can occur in all seasons; this might be due to lack of awareness on preventive behaviors against dengue infection throughout the year. Future health education programs should emphasize those points, because knowledge is positively associated with preventive behavior. Therefore, if they had better knowledge about dengue infection, they would also be expected to have better preventive behavior.

2.3 Attitude towards dengue infection

In this study attitude had no significant association with preventive behaviors against dengue infection in controlling breeding places. This agreed with the study of Hairi et al. (2003) knowledge, attitude and practices (KAP) on dengue in Malaysia and found that there was no significant association between attitude and preventive practice on dengue. However, it is not consistent with the results of Somchai Teetipsatit (2005), who found that attitude had significant association with risk preventive behavior on dengue hemorrhagic fever and the study of Kyu (2003) found that there was a very highly significant positive association between attitude and practices regarding dengue fever prevention. Most of Family Health Leaders had attitude at moderate or good level, but they might not concern about prevention, although the public health officers give them the information about the disease. The possible reason may be that since most of them were in agriculture, they went to the

field early morning and did not come back home until evening, therefore they did not have time to do activities that related about preventive practice on dengue infection.

This study revealed some incorrect attitudes towards dengue prevention among respondents. The first was eliminated mosquito larvae in drainpipe can prevent and control dengue infection and another was dengue infection prevention is responsibility of the public health staff only. Therefore, if Family Health Leaders did not clearly understand in prevention and control of dengue infection, they might not cooperate appropriately to eliminate the cause of dengue infection. Future health education programs should emphasize these points.

2.4 Resources for prevention of dengue infection

The relationship between sufficiency of resources and preventive behaviors against dengue infection showed significant association. This study agreed with Somchai Teetipsatit (2005), who studied factors associated with preventive behavior on dengue hemorrhagic fever among family leaders in Ban Chang-lo, Bangkok-Noi, Bangkok, and found significant associations between adequate resources and preventive behavior on DHF. A study conducted by Vipa Limkhumsuk (1997) 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 increased risk of mosquito bites. Therefore, the availability of resources for prevention and control dengue infection is an important factor in the ability of FHLs' preventive behavior against dengue infection. Insufficient resources could well be a barrier to effective prevention. In this study found that Family Health Leaders prefer to put temephos sand in their water container rather than change water and clean

containers once a week because they always receive temephos sand free of charge from government sectors and temephos sand has a long term in residual effects about 3 months. For a long term in residual effects about 3 months, sometime FHLs maybe forgot the date that they put temephos sand if they put it more than 3 months, with the result that mosquito larvae were not well controlled. This choice of behavior could waste government money because temephos sand is very expensive, this study found that there was no association between using temephos sand and preventive behavior. However, some other resources are strongly associated with preventive behavior. This suggests that temephos sand is not as important as the other resources in helping prevent dengue infection. These other resources could replace temephos sand with no reduction in effectiveness of dengue prevention and in this year and future; Ministry of Public Health may be not provided the budget for buy temephos sand in province, which has low incidence on dengue infection. Therefore, public health officers should promote Family Health Leaders to clean water containers regularly, and generally to use local resources that can find easily in community such as larvivorous fish, plants with repellent property that help prevent dengue infection both effectively and inexpensively. In this study found that the other resource most commonly used was larvivorous fish. This was followed by citronella, kaffer lime, ucaliptus, turmeric, and others.

2.5 Frequency of receiving information about dengue infection

Receiving information about dengue infection had significant positive correlation to preventive behaviors against dengue infection in controlling breeding places. It was also associated significantly with use of mosquito coils, and with

community-level cooperation in fogging spray and anti-dengue campaign. This result is consistent with the result of Somchai Teetipsatit (2005), who found that, there was significant associations between information from media and public health officers and preventive behavior on DHF and study of Ratchanee Putkuntod and Tanin Suteeprasert (2002) found that reinforcing factors was positively related to control and preventive behavior of dengue fever.

Overall, the respondents had frequency of receiving information at moderate level. Therefore public health officers should increase frequency of information necessary to help them remember information about dengue infection. 36.0% of respondents did not know some repellent do not use for children younger than 4 years old and 22.0% did not know don't use mosquito coil in baby room, patient room, and elderly room , therefore health program should attend in this point because it may be make harmful for life. In this points should trained for health officers and village health volunteers because Family Health Leaders received information mostly from village health volunteers and health officers.

2.6 Number of sources of information about dengue infection

Number of information sources had significant associated with preventive behavior. Most of them received information from village health volunteer, health officer and television, while they received less information from newspaper, and relative/friend. This study agreed with study of Pornpimol Puangngeon (1997), and a previous 'KAP' study conducted in Mae Sot with Thai people in which the main source of dengue information was health personnel (Yongyut Swaddiwudhipong et al., 1992). Somchai

Teetipsatit (2005) found that family leaders received information about disease from television and health volunteers. Ratchanee Putkuntod and Tanin Suteeprasert (2002) found that reinforcing factors was positively related to control and prevention behavior of dengue fever. However, the current results are not consistent with those of a KAP study of migrant woman in Mae Sot sub-district, Tak Province, in which the main source of information was from family, friends, or neighbors (Kyu, 2003). The reason why Family Health Leaders in the present study had received more information may be due to a campaign to eliminate mosquito breeding places, promoted by the Ministry of Public Health and conducted throughout the rainy season during the previous year. The health officers should increase number of information sources for improving their knowledge to conduct better preventive behavior. Because they had known about information of prevention on dengue infection before in some sources, so after they were received information again by other sources should let them remember the appropriate information more easily. Different sources of information have different technique contribute information, such as some sources easily to perceive the meaning of information and some might be difficult to understand the meaning. Therefore all of information sources should use appropriate ways to contribute information, because most of FHLs were educated only at primary school level.

3. Scope and limitations

1. In this study, multi-stage sampling, a probability sampling method, was used, in which every Family Health Leaders in Kongkrait District had an equal chance of being selected in the sample. The sufficiently large sample size and the

probability sampling design can assure good representativeness of the study sample, and reasonable generalizability of study findings. At the same time, this study represents Kongkrait District only, and does not necessarily represent the whole Family Health Leaders in Sukhothai Province and elsewhere in Thailand.

2. This study analyzed association between independent variables and dependent variables by Chi-square test and correlation analysis, and did not analyze by multivariable techniques such as logistic regression. Therefore, this study was not able to fully test the relative importance of independent variables, and was not able to fully identify confounding among these variables.

3. The study was a cross-sectional survey; therefore it could not look at practices regarding dengue infection over time. Nevertheless, the results of this study are expected to be useful as baseline data in planning anti-dengue health promotion intervention programs in Kongkrait District. Also, results of this study, along with those of other studies, should provide a useful basis for planning anti-dengue activities elsewhere in Thailand.

4. Recommendations

On the basis of findings in this study, The following issues should be considered for improving preventive behavior against dengue infection among Family Health Leaders and strategies be set up as follows:

1. Organize educational programs for improving knowledge about dengue infection should focus on instruction of proper proportions of temephos sand and water; period of effective chemical action; and appropriate container, everybody can get dengue infection not only in children and teenage, dengue infection can occur in

all seasons, and elimination of mosquito breeding sources as well as methods of preventing mosquito bite. Health officers and health volunteers should carry out this educational campaign throughout the year, not only during the rainy season.

2. Public health officers and village health volunteers should encourage community for the inspection of mosquito breeding sources, evaluation of mosquito control in villages regularly and continuously throughout the year, and should analyze and monitor the situation in areas regularly in order to determine the trend of infection, and set up preventive action plan.

3. Encourage Family Health Leaders to use existing local resources that can prevent mosquito bite, and control mosquito larvae in water container in an effective and economical fashion such as larvivorous fish, plants with repellent property, etc. and encourage regular cleaning of water containers instead of frequent use of temephos sand, which is very expensive.

4. It would be desirable to increase frequency of information and number of information sources for improving their knowledge to conduct better preventive behavior.

5. The activities emphasized to improve the preventive behaviors against dengue infection should be increasing the capacity of the people in community to help themselves prevent the disease, and not always rely on others to do this for them.

6. Several studies to date have characterized dengue preventive behaviors and their determinants. The next generation of studies should include more assessments of relationships of preventive behaviors with actual risk of mosquito bites, and with actual risk of dengue infection.