

CHAPTER II

REVIEW OF RELATED LITERATURE

In this chapter, related theories and concepts, as well as relevant research literature, are reviewed.

2.1 General Knowledge about Dengue hemorrhagic fever

The global epidemiology and transmission dynamics of dengue viruses were changed dramatically in Southeast Asia during World War II (Gubler, 1997). The disruption and change in the ecology caused by the war effort expanded the geographical distribution and increased the densities of *Ae.aegypti*, making many countries in this region highly permissive for epidemic transmission. Troop movements accelerated the spread of viruses between population centers in the region, causing major epidemics. By the end of the war, most countries in Southeast Asia were hyperendemic (when multiple dengue virus serotypes co-circulate in a community), and a few years later epidemic dengue hemorrhagic fever (DHF) emerged in the region. The first recorded epidemic of DHF occurred in Manila, Philippines in 1953-1954, followed by Bangkok, Thailand in 1958 and Malaysia, Singapore and Vietnam in the 1960s. With the economic boom and associated urbanization in Southeast Asia in the postwar years, epidemic DF/DHF spread to the whole region during the 1970s (Halstead, 1992).

Epidemic DHF was localized in Southeast Asia during this period because of the isolation of the Pacific islands and the successful *Ae. aegypti* eradication program in the Americas to control urban yellow fever. In the 1970s, however, the American program was disbanded and *Ae. aegypti* re-invaded most countries in the region. Modern transportation facilitated and increased the movement of people and commodities within and between regions of the world, leading to increased movement of both the mosquitoes and the viruses. As a result, epidemic DF/DHF spread to the Pacific and the American tropics. In the 1980s and 1990s, both the mosquito vectors and the viruses continued their global geographical expansion, causing increased frequency and magnitude of epidemic DF, and the emergence of DHF.

Factors responsible for resurgence

There are many factors that were responsible for this dramatic resurgence of epidemic DF/DHF in the waning years of the 20th century, some of which are not well understood (Gubler, 1998). It is clear, however, that demographic and societal changes such as population growth, urbanization and modern transportation contributed greatly to the increased incidence and geographical spread of dengue activity. For example, Gubler and Meltzer showed that the increase in the reported number of cases of DF/DHF has historically been highly correlated with human population growth (Gubler & Meltzer, 1999). This was compounded by complacency about infectious diseases in general and vector-borne diseases in particular, and a lack of public health resources for research, surveillance, prevention, and control programs. Increased epidemic activity caused by multiple virus serotypes increased

the rate of genetic change in the viruses, and thus increased the probability of the emergence of virus strains or genotypes with greater epidemic potential and/or virulence, an important risk factor for DHF. In the past 20 years, new virus strains have been detected with increasing frequency in new geographical areas, some resulting in epidemic transmission and others resulting in silent transmission. This change in the transmission dynamics of dengue viruses also increased the probability of secondary dengue infections, another principal risk factor for DHF (Halstead, 1997).

Public health impact

At the beginning of the 21st century, DF/DHF is the most important arboviral disease of humans, occurring in tropical countries of the world where > 2.5 billion people are at risk of infection. More than 100 tropical countries have endemic dengue virus infections, and DHF has been documented in > 60 of these countries. Surveillance for DF/DHF is poor in most countries, and in the past has focused primarily on DHF; the number of DF cases that occur each year can therefore only be estimated. In 1998, however, major epidemics occurred throughout Asia and the Americas, with >1.2 million cases of DF/DHF reported to the WHO. Global reports of DHF have increased on average by fivefold in the past 20 years. At the beginning of the 21st century is estimated that between 50 and 100 million cases of DF and several hundred thousand cases of DHF occur each year, depending on the epidemic activity. The case fatality rate (CFR) varies among countries, but can be as high as 10-15% in some and < 1% in others.

The majority of DHF cases are reported from Asia where the disease has affected most countries, and is a leading cause of hospitalization and death among children. In the American tropics, DHF was a rare disease before 1981. Since that time, epidemic DF/DHF has become one of the most important public health problems of the region. The only tropical region of the world where it is not considered a major problem is Africa, where other disease problems are overwhelming by comparison. The real public health impact of DF/DHF occurs during epidemics of this disease. Because surveillance is poor, the early stages of epidemic transmission are usually not detected, with cases grossly under-reported until the epidemic is recognized as dengue, which is usually near peak transmission; it then becomes grossly over reported. Emergency mosquito control is usually initiated at that time, but these efforts are usually misdirected, and are too little and too late to have any impact on the epidemic. Thus, the public health impact of epidemic DF/DHF is amplified because there is poor surveillance, no public health planning and no properly implemented emergency response plans.

Social impact

The successful *Ae.aegypti* control program in the Americas was part of the global success story against infectious disease in the 1950s and 1960s. The resulting complacency that evolved among government and public health officials and the public health officials and the public eventually led to the perception that DF was not an important disease and, ultimately, to deterioration of the public health infrastructure needed to deal with DF and other vector-borne disease. When epidemic

DF/DHF began to re-emerge and spread geographically, first in Southeast Asia in the 1950s-1970s and then globally in the waning years of the 20th century, it was ignored for the most part by public health officials, and the public had to tolerate the interruption of their lives that occurred every few years when the periodic but progressively more frequent and larger epidemics occurred.

Epidemiological changes

Demographic, economic, behavioral and social factors are often keys for effective communicable disease control and underpin successful public health programmes. Despite promising indications in the literature, these factors have remained poorly understood in the case of dengue. Furthermore, recent field evidence raises some questions regarding widely accepted characteristics of dengue that need review and confirmation.

2.2 Village Health Volunteers

Village health volunteers refer to individuals who have been elected by villagers to undergo the training designed by the Ministry of Public Health. Their main responsibility is to be the change agents. In other words, they are responsible for leading the changes in health and hygiene of the villagers, disseminating knowledge and information, planning and coordinating public health development activities, and providing different public health services such as health promotion, surveillance and prevention of diseases, first aids, referral services, rehabilitation, and basic public health development activities in the village and community.

The number of public health volunteers in each village/community.

Rural areas: one village health volunteer per eight to 15 households

Urban areas: Densely populated areas (market communities): no public health volunteers

Urban areas: Crowded areas: one village health volunteer per 20 - 30 households

Suburban areas: one village health volunteer per eight - 15 households

Duties and responsibilities of village health volunteers

1. They are responsible for informing villagers of public health news and information:
 - Making appointment with villagers for public health services
 - Informing villagers of the onset of important diseases or communicable diseases in the local community
 - Informing villagers of public health activities in the village
2. They are responsible for retrieving public health information and other related information from fellow village health volunteers and villagers:
 - Urgently informing public health officials of significant local public health information
 - Recording the information in the "record book of performance outcomes of public health volunteers"

3. They are responsible for giving advice, transferring knowledge, and recruiting villagers to take part in various public health developmental activities including the following:
- Use of public health services and use of medication
 - Vaccination, immunization, and prevention and control of communicable diseases
 - Environmental sanitation and provision of clean water
 - Personal hygiene
 - Nutrition and sanitation
 - Prevention and control of local diseases
 - Family planning
 - Hygiene for mothers and babies, including care for children with abnormal development
 - Dental hygiene
 - Care and promotion of mental health
 - Prevention and control of AIDS
 - Prevention and control of accidents and unimportant communicable diseases
 - Prevention and control of pollution
 - Consumer protection regarding public health
 - First aids related to wounds, injuries, broken bones, and sprains
 - Promotion of traditional and herbal medicines

4. They are responsible for providing medical assistance:
 - Providing assistance and initial care according to initial symptoms
 - Giving first aids
 - Referring the patients to public health service providers and checking up on the referred patients
 - Distributing contraceptive pills among the patients who have been examined by the public health officials and distributing condoms
5. They are responsible for monitoring and preventing public health problems in various aspects:
 - Nutrition: measuring body weight and helping solve malnutrition and Lack of iodine problems
 - Hygiene of mothers and babies: making sure that pregnant women receive needed prenatal care and check-ups, measuring body weight of pregnant women every month, following up on children younger than five years of age, and making sure they receive scheduled check-ups
 - Immunization: Making sure the mothers take their babies to receive vaccination as necessary
 - Control of local diseases: Destroying the breeding grounds of *Aedes aegypti*, collecting stool samples for examination of parasites, taking blood samples for malaria, and collecting phlegm for tuberculosis examination
 - Quality of drinking water: Using chemicals to examine water for bacteria, adding chlorine into drinking water, etc.

- Dental care: Selling toothbrushes and toothpaste
 - Prevention and control of accidents: Forming groups to prevent accidents and hazards in the community
 - Control of non-communicable diseases: Checking blood pressure, checking urine glucose, organizing rehabilitation groups for the disabled, etc.
 - Protection of consumers: Organizing groups to protect consumers from illegal activities such as sales of expired medicines or foods with no nutritional quality
 - Prevention of AIDS: Organizing groups to prevent the spread of AIDS in the community, giving free condoms, etc.
 - Prevention and control of pollution: examining quality of water sources in the community, testing air quality, coordinating with other agencies and organizations to monitor and take care of the environment in the community, etc.
6. They are responsible for being the leaders in developing the quality of life of the villagers.
 7. They are responsible for protecting the rights to public health care of the villagers.
 8. They are responsible for being the coordinators in public health work of The village. This is done by encouraging meetings, planning, and Cooperation among public health volunteers, village representatives, other local leaders, and public health officials.

The assignments of tasks of village health volunteers

1. One village health volunteer is responsible for taking care of all family members of all households in the neighborhood, ranging from eight to 15 households, according to the specified duties and responsibilities of village health volunteers.
2. Village health volunteers take turn offering basic public health services at the community basic public health centers as previously agreed upon.
3. They help develop the village in collaboration with the village committee.

2.3 The roles of village health volunteers regarding DHF

1. They cooperate with other village health volunteers to work in the community.
 - 1.1 Village health volunteers stimulate the community members to form groups to ensure cooperation to control and destroy the breeding grounds of *Aedes aegypti* larvae.
 - 1.2 The working groups in the community should consist of community leaders, village health volunteers, chiefs of *Tambon (kamnan)*, and village heads, with the local administration organizations and government officials providing assistance in terms of budgets and knowledge necessary in carrying out the tasks. Village health volunteers should work as coordinators among different groups of people.
 - 1.3 Village health volunteers should conduct a brainstorming session to enable the working group members to plan, share ideas, exchange

experiences, and work together to plan for prevention and control of dengue hemorrhagic fever in the community.

2. They disseminate information to encourage cooperation.

2.1 Village health volunteers disseminate knowledge about prevention and control of dengue hemorrhagic fever in the neighborhood through the news tower. Information can also be posted in public places such as the health centers, village reading rooms, etc., as well as spread during the talks with the community members.

2.2 Village health volunteers publicize the new cases of dengue hemorrhagic fever in their own community and the communities nearby to stimulate the destruction of the breeding grounds of *Aedes aegypti* larvae. They should also immediately inform public health officials and spray insecticide in the house of patients with dengue hemorrhagic fever.

2.3 They should talk with the neighbors to receive information and to learn about their opinions or ideas whenever possible such as during social functions including religious ceremonies, weddings, etc.

2.4 They should organize activities to encourage villagers to help prevent and control dengue hemorrhagic fever. For example, they may advertise the success of any household or group of households in destroying the *Aedes aegypti* larvae.

3. They regularly destroy the breeding grounds of *Aedes aegypti*.
 - 3.1 They inform each of the households to prevent and control dengue hemorrhagic fever in their house every week, and then help one another to the same task in the community on a regular basis all year round, especially in the areas where the *Aedes aegypti* larvae and mosquitoes are abundant.
 - 3.2 They coordinate with community members to prevent and control dengue hemorrhagic fever by destroying the breeding grounds of *Aedes aegypti* larvae on a weekly basis at temples, mosques, schools, infant development centers, etc.
4. They monitor and evaluate their work.
 - 4.1 They survey their house every week to see if there is any *Aedes aegypti* larva. If there are some, they should immediately be destroyed.
 - 4.2 The working groups and committee members have to carry out a survey of *Aedes aegypti* larvae in public places on a weekly basis.
 - 4.3 Simple assessment should be conducted by village health volunteers. This can be done by looking for signs of mosquito bites on the infants' body. Even one infant with mosquito bites is considered a risk. If a number of infants with mosquito bites are found, it means that mosquitoes are abundant in the area. Village health volunteers must then immediately destroy the breeding grounds of *Aedes aegypti* larvae and kill the mosquitoes in the area.

4.4 The working group should summarize what they have done and report it in the community meeting. Idea sharing sessions should be held to help one another solve problems, overcome obstacles, and more effectively work to prevent and control dengue hemorrhagic fever in the community.

2.4 Theories Related to Perception

Individuals' perception is a psychological condition which takes place within them. It is individuals' interest in responding to various arousals, and it is also a foundation in letting the information from these arousals enter the perception process through the body's sensory perceptions. When the information is fed into the thinking system, individuals will then systematize the information before the memorization and interpretation processes occur. These two processes depend on individuals' internal qualification such as the medium used in the interpretation. Individuals will have behavioral expressions in accordance with their decision, and the outcome of such expressions will become the feedback that is once again fed into the perception process.

Definition of perception

New Webster Dictionary (1975) defines perception as the expression of the feelings in individuals' mind.

Garrison & Magoon (1972) define perception as the process in which the brain interprets or translates the meaning of the information derived when the body senses

arousals or the environment. This enables individuals to understand what the arousals or environment are, what their meaning is, and what they are like. Individuals need to depend on their past experiences to interpret or translate the arousals.

According to KoZier B Erb (1989), perception is an experience related to feelings, interpretation, and understanding of different things in the world. Perception is individual-specific and it is an action that takes place within individuals.

Chaplin (1968) contends that perception is an internal process which can be realized by individuals. It is the acknowledgement of feelings, and this process involves giving meaning based on past experiences that requires diagnoses. Besides, perception is human beings' ability to analyze different things that they sense. It is an intuition of instinct or belief in something that takes place immediately and that can be used in the assessment as well.

Malee Sonthikestrin (1976) defines perception as a process in which individuals learn about different things around them and within them through their sensory perceptions including seeing, hearing, feeling, tasting, and touching.

Kobkul Pancharoenvorakul (1985) points out that perception is a cognitive and mental process of individuals. It is an expression which has a goal and a driving force. Individuals' perception is an expression of their awareness, and this process works by gathering and interpreting information received from the outside through sensory perceptions and memory.

Krongkaew Yusuk (1998) states that perception results from different components including age, gender, economic status, education, experience, emotion,

values, and other environments. All of these result in reactions or responsive behaviors as perceived by individuals.

Shermerhorn et al. (1975) define perception as an initial psychological process used to interpret different arousals to create an important experience for the perceivers. According to them, perception makes individuals different from one another, as one individual's perception will never be exactly the same as others'. When individuals receive arousals, they will process such arousals into specific experiences meaningful to themselves, as illustrated in the figure below.

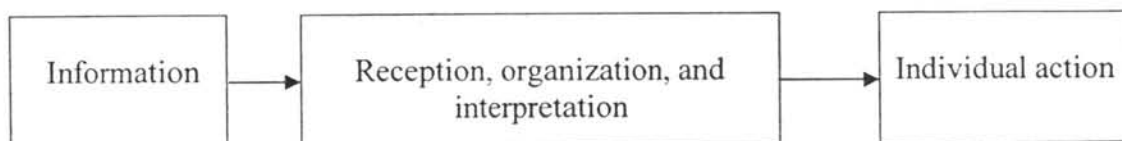


Figure 1: The perception process of Shermerhorn, Hunt, & Osborn

All of these have an influence on individuals' perception. It results in responses in the form of action or behavior. In general, perception has a very significant influence on individuals' behaviors. If individuals have correct perception, their behaviors will reflect such perception of theirs. However, if they have incorrect perception, their behaviors will be entirely different. In brief, perception makes individuals have different behavioral expressions.

Self-Efficacy Theory

According to Bandura (1997), perceived self-efficacy is individuals' decision about their ability to perform an action in a specific situation. Perceived self-efficacy is not a personal trait, because it does not depend on the environment. Rather, perceived self-efficacy is an individual's expectation of their own capability which

can be changed according to the nature of work or the specified activity in the situation they are facing.

Perceived self-efficacy has a major influence on human behaviors. Having knowledge and capability does not guarantee success if individuals lack perceived self-efficacy to utilize such knowledge and capability. There are two factors which determine whether individuals will adopt any behavior:

1. Outcome expectation: Outcome expectation refers to individuals' expectation of the outcomes that will take place if they adopt certain behavior. According to Bandura (1986), outcome expectation can be divided into three types as follows:
 - 1.1 Physical effects—Positive physical effects include happiness and comfort; negative physical effects include pain and discomfort, etc.
 - 1.2 Social effects—Positive social effects include social acceptance or recognition, reputation, power, or monetary return; negative social effects include lack of acceptance, disinterest, punishment, etc.
 - 1.3 Self-evaluative reaction to one's own behavior—self-satisfaction, self-pride, and self-worth, as well as dissatisfaction with self, or sense of worthlessness.
2. Efficacy benefits: Efficacy benefits refer to individuals' belief that they are able to have certain behaviors or perform specified actions. This is an important factor as it leads to actual performance to achieve the expected outcomes.

2.5 Factors Related to Perception

Garrison & Magoon (1972) points out that in order for individuals to perceive the arousals, they need to use their experience to interpret the meaning of such arousals. Without past experiences, they would not know what the arousals mean.

According to Tonglor Suwankan (1978), the first influences which make individuals have different perceptions are gender, occupation, and economic status. In addition, different knowledge, in terms of both quantity and accuracy, results in different perceptions of individuals. In other words, individuals with different educational backgrounds have different perceptions.

Chaiyaporn Wichawut (1978) explains that perceptions depend on individuals' experiences. If individuals have experiences similar to the arousals, they tend to have similar perceptions. For example, the perception of the characteristics of individuals in each profession depends on our own experiences with people in that particular profession. It can be based on direct experience such as from working with them, knowing someone in that profession, or having worked in that profession themselves. It can also be indirect experiences such as by someone else's accounts, or from movies or newspapers.

Sithichoke Waranusantikul (1981) defines the factors influencing individuals' perception as follows:

1. Needs: Individuals' own needs make them perceive the arousals as something to satisfy such needs. Put another way, needs are the motivation that makes individuals interpret the arousals as something to serve their needs. For instance, when individuals are hungry, they are

more likely to perceive any arousal related to food faster than others. They may hear the bells of the vendors sooner than other noises that are around them at the same time.

2. Experiences: Individuals tend to interpret the arousals based on their own background.
3. Preparation: When individuals have experienced and learned about something, they tend to respond to similar arousals based on their past experiences and learning.
4. Personality: Personality is associated with perception. For example, stubborn and inflexible individuals tend to perceive the changes of the arousals later than those who are more flexible.
5. Attitudes: When individuals have positive attitudes towards particular persons, their actions will always be perceived as favorable.
6. Social position and role: Individuals with different social positions and roles are more likely to have different perceptions of the same arousals.
7. Culture: Culture makes individuals have different perceptions of the same thing.
8. Emotional status: It also affects individuals' perceptions.

Perception is the first step leading to behaviors. However, perception is only one of the factors that play a significant role in the formation of behaviors such as roles and role expectation, motivation, etc. Nevertheless, perception is important in that if individuals have accurate perception, their behavior will be based on such

accurate perception of theirs. In brief, perceptions make individuals have different behaviors.

According to Kobkul Pancharoenworakul (1985), individuals' perception varies depending on the organs used in perceiving such as sensory perceptions and cognition or intellectuality of individuals. In addition to this, other factors which influence individuals' perception are past experience, self conceptualization, biological heredity, biological background, educational background, financial status, and social status.

Arnold & Feldman (1986) have defined different factors which have an influence on individuals' perception as follows:

1. Existing characteristics: Images of different things result from summarization and interpretation or stereotype of each group of individuals. This can cause either positive or negative biases. Such images depend on the characteristics of each group such as ethnicity and gender. They can also depend on type of work or organizational arrangement, etc.
2. Personal characteristics: Differences in individuals' characteristics have an influence on individuals' perception including attitudes, emotions, experiences, and needs.
3. Situational characteristics: Examples of situations that affect individuals' perception are stress, time, etc.

In summary, the factors which have an influence on perception are as follows:

1. Physiological factors: sensory perceptions such as hearing, seeing, smelling, tasting, etc.
2. Characteristics of the person who perceives factors: attitudes, emotions, values, needs, motivation, personality, experience, and frequency of experience, etc.
3. External environment factors: social position and roles, social components, culture, organizational arrangement, and surrounding environment.

Ranee Viriyacharoenkij (1992) studied the factors associated with role perception actual role performance of the heads of nursing department of community hospitals in the northeastern region. The findings of the study indicated that the head nurses who had undergone management training had a higher level of role perception and actual role performance than those who lacked training. However, working experience was found to have no association with the head nurses' perception.

Research related to the study variables

Gender

Gender is a factor which indicates quality, power, and natural capability of individuals based on hereditary factors (Orem, 1985, cited in Pitchayaporn Moolsilp, 1993). Apart from physical structures, males and females also differ in terms of mentality and work performance (Siriwan Vajirawongse, 1993). Taptip Thitipongpanich, 1996 cited in Sanya Khaosawang, 2000) studied factors influencing overall acceptance of quality administration of staffs working in hospitals under the

Ministry of Public Health and found that gender did not affect overall acceptance of municipal administration. Likewise, Supot Chitsanguansuk (1992) reported that there was no relationship between gender and performance. However, Chuleeporn Chawangesaksopak (1998) studied teenagers' perception of Western society and found that gender was associated with perception about Western society.

Age

Age affects working roles. That is, routine or laborious works are not appropriate for individuals of younger ages (Preeyaporn Wonganuttaroj, 1992). In addition, Amporn Chantaraksa (1993) found that nurses who were between 22 and 30 years of age had the lowest level of work performance, while those aged 40 years old or older had the highest actual work performance. Similarly, (Apassara Wongsampan, 1995 cited in Sanya Khaosawang, 2000). reported that age was associated with work performance. However, Sumate Tipayachat (1990) discovered that there was no relationship between age and work performance.

Marital status

Tassanee Srichan (1985) and Jeerapa Pinyosap (1989) conducted a study with heads of health stations in Lampang and Udon Thani Provinces and found that there was a positive relationship between marital status and work performance. That is, those who were single had higher work outcomes when compared to those who were married, separated, divorced, or widowed. On the contrary, Sumate Tippyachat (1990) carried out a study with health officials working at health stations in Pitsanuloke Province and found that marital status was not associated with work performance.

Educational background

Supot Chitsanguansuk (1992) found that there was no relationship between educational background and work performance of public health volunteers. A similar finding was reported by Jaroon Khunsong (1996) who found that members of Tambon Administration Organization who had different educational background did not have different awareness of river and canal conservation.

Occupation

Montri Duangprueksa (1998) investigated the opinions of members of Tambon Administration Organization on participation in management of forest resources. The findings showed that members of the TAO who had different occupations did not have different opinions toward management of forest resources. Likewise, Chatchai Tosinthiti (1986) found that members of the House of Representatives who had different occupations before being elected were not different when it came to attitudes toward social, cultural, and economic effects of establishment of casinos in Toongkularonghai Area.

Income

Income is an indicator of socioeconomic status of individuals, and it could predict occupation and education of individuals as well. High education means job security and stable income (Hollingshead, 1983, cited in Pitchayaporn Moolsilp, 1993). A study of Indhiraporn Promprakarn (1998) revealed that income was associated with self-care behaviors of diabetic patients. Similarly, Anuchit Isariyamate (1993) found that different incomes resulted in different awareness in solving pollution problems in Chaopraya River.

Duration of being VHVs

Plengpin Manyu (1997) found that knowledge and practice about environmental problems of members of Tambon Administration Organization were not related to duration of residence in the community. Similarly, Montri Duangpreuksa (1998) found that members of Tambon Administration Organization who had different duration of residency did not have different opinions toward management of forest resources.

Other positions in the community

Naris Khamnurak (1995) reported that people who were members of a social group had more participation in rural development than those who did not belong to any group. In addition, Thianchai Burapachanok (1989) studied participation of the community in sanitary activities in fundamental public health self-dependent villages in Rayong Province and found that the subjects who had a title or position in the village had more participation in community participation. Likewise, Somsak Kulsarawut (1997) investigated readiness of community members to conserve water resources and found that those who were village committee members had more knowledge about water conservation than those who were not committee members.

Illness experience

History of illness

Kozier & Erb (1988) pointed out that past experience or experience related to health or sickness was related to perceived health status of individuals. Besides, Monjira Thamangraksat (2002) found that illness experience was associated with perception of contagious diseases which were new problems. Finally, Yukolthorn Thongrat (1997) reported that the study subjects who had a long history of illness had better perceived health status than those in other groups.

2.6 Related Research

The Division of Health Education, Ministry of Public Health (1978) conducted research to assess the performance outcomes of village health volunteers in Samerng District, Chiang Mai Province, by means of participatory observation in the community. The findings showed that personal factors and family factors had an effect on the performance of village health volunteers. That is, young village health volunteers tended to be less successful because they were too afraid to be expressive. In addition, people in the rural areas tended to respect males more than females. Finally, village health volunteers with a higher economic status were more willing to devote their time to work than those who were not as well to do financially.

Benja Yoddamnern (1979) assessed the performance outcomes of village health volunteers in Hangchat District, Lampang Province. She discovered that the persons who were most suitable to work as village health volunteers were those who were well-rounded and were capable of doing different tasks such as giving first aids or offering traditional medicines. Moreover, individuals who regularly worked for the

community such as being a village development committee member were also suitable for volunteer works because they had a high social status, had leadership, and were able to be leaders in the thinking of community members.

Taweetong Hongwiwat et al. (1981) investigated the outcomes of the Thai basic public health project. According to the study findings, the performance of village health volunteers was found to be satisfactory for only a short period of time. In the long run, however, village health volunteers had very little influence on the operation of the Thai basic public health project. This was because most village health volunteers emphasized giving medical assistance and prescribing medicines. It was also found that the village health volunteers lacked necessary involvement in health promotion and disease prevention.

Pavinee Pengsart (1986) examined perception and role acceptance of village health volunteers in the rural areas in Muang District, Khon Kaen Province. The sample of the study consisted of 52 village health volunteers and 260 community members. Data were collected by means of interviews. According to the findings of the study, the role acceptance of village health volunteers was at a satisfactory level (86.5%). Furthermore, one of the factors which influenced the role acceptance of village health volunteers was proximity to the health centers. Put another word, villagers who lived closer to the health centers accepted village health volunteers more than those who lived further away. As regards the factors affecting the role performance of village health volunteers, it was found that the knowledge about health, position in the village, and duration of work (being village health volunteers for one to three years) had more effects on their work performance.

Thongdee Horwattanapanich (1993) investigated the factors influencing the abundance of *Aedes aegypti* larvae in Lamplaimas District, Bureerum Province, and found that the factors which had an influence on the abundance of *Aedes aegypti* larvae were the activities to prevent dengue hemorrhagic fever in the village and elimination of the breeding grounds of *Aedes aegypti*. Other factors were village health volunteer factors (dissemination of knowledge on how to prevent dengue hemorrhagic fever and satisfaction with the work of health officials) and supporting factor in preventing and eliminating *Aedes aegypti* mosquitoes (abate sand).

Prapas Khammak (1995) carried out a study to explore knowledge, attitudes, and practice to prevent dengue hemorrhagic fever of village health volunteers in Satingpra District, Songkla Province. The findings showed that most of the village health volunteers had previous training on prevention and control of dengue hemorrhagic fever. Moreover, they had knowledge at a moderate level, and there were relationships among knowledge, attitudes, and practice to prevent and control dengue hemorrhagic fever.

Watcharee Katesopit (1984) investigated the outcomes of a health education program to prevent and control dengue hemorrhagic fever in Kalasin Province. In this study, community leaders were asked to attend a meeting before carrying out their work in the community. When considering the practice outcomes of the community members, it was discovered that there was an increase in correct practices of both males and females. Also, educational background was associated with self-practice, and those who were wage earners had more correct practices than those who were traders with statistical significance.

Rattana Untapan (1996) studied the factors influencing the work of 161 Fundamental Community Health Centers in Uthaithani Province. Data were collected by means of a questionnaire to assess the performance outcome and by an interview of one village health volunteer per center. It was found that attitudes were positively associated with the overall performance outcomes and certain aspects of performance outcomes including public health information, development of fund administration, provision of basic health services, and storage of equipment.

Rangsan Chaocharoen (1999) conducted a study to examine behaviors to prevent and eliminate *Aedes aegypti* mosquitoes of village health volunteers in Srimahosot District, Prachinburi Province. The findings indicated that the mean score of understanding was 6.05 out of the full score of 10. Furthermore, practices in the household or in the compound were equal to 100%, and 85.8% participated in the activities to prevent and eliminate the breeding grounds of *Aedes aegypti* larvae in the community. Finally, as for problems and obstacles, 49.2% reported that it was too difficult to carry out a complete survey of breeding grounds of *Aedes aegypti* larvae in wooded areas with small ponds of water.

Prakobporn Sinthurat (1999) assessed the performance outcomes of village health volunteers in Muang District, Ayuthaya Province. A survey study was conducted, and data were collected by means of interviews of 184 village health volunteers who had been working for more than one year. It was found that age, work experience, and training were not associated with the performance of these health volunteers. On the other hand, knowledge and attitudes were positively related to their work with statistical significance.

Boonmee Noonyo (2000) assessed the role of village health volunteers in preventing and controlling dengue hemorrhagic fever in Gudchoom District, Yasothorn Province. A descriptive design was employed, and five subjects were randomly selected from each village, totaling 120 subjects. According to the study findings, 99.2% of the village health volunteers provided advice regarding dengue hemorrhagic fever, 90.0% organized activities to prevent dengue hemorrhagic fever with public health officials, 97.5% led the villagers to eliminate *Aedes aegypti* larvae in containers filled with water, 55.0% sent the patients suspected to have dengue hemorrhagic fever to the health center or hospital, and 66.7% submitted the report on prevention of dengue hemorrhagic fever to the public health officials.

Supot Chitsanguansuk (2001) conducted a study to explore the work of village health volunteers in Saraburi Province. Data were collected by means of interviews of the sample of 40 village health volunteers. The findings of the study indicated that demographic characteristics of the subjects were not related to their work performance and that perceived self-efficacy to perform fundamental public health work was the only variable that could predict performance outcomes.

Saowanee Panpattanakul (1994) investigated perceived family roles in giving care to HIV-infected patients in Don Bua Village, Muang District, Payao Province. The findings revealed that knowledge about AIDS, marital status, education level, and experience were associated with the subjects' perception with statistical significance.

Based on the review of literature and related research, it can be concluded that public health volunteers play a major role to prevent and control DHF. The factors which affect perceived self-efficacy of public health volunteers are gender, age,

marital status, educational background, occupation, income, duration of being public health volunteers, training, and history of illness. If public health volunteers have positive perception of their roles, they should have positive work performance to prevent DHF, thus enabling the community to be free from DHF and the community members to maintain good health.