

## CHAPTER 4

### RESEARCH METHODS

#### 4.1 Study Design and Study Site

A cross-sectional community-based survey was carried out in a study area of eight hamlets situated in Suan Phung district, Ratchaburi Province in Thailand. The population is about one thousand living in round about 200 households. The malaria clinic is located almost at the center of these hamlets and the nearest hamlet is 3 kilometers away from malaria clinic and the furthest one is about 14 kilometers away from it. A health center is located in the same hamlet of malaria clinic and the health assistant has his own clinic working during off office hours. The hospital is available only in Suan Phung district which is more than 20 kilometers away from this hamlet at which malaria clinic is located. One village malaria volunteer is available in the hamlet "G" which is about 14 kilometers away from malaria clinic.

#### 4.2 Characteristics of Study Population

The study population was the people living in study area. One representative from one household was selected as a sample. 98 representatives were selected as a sample. The household representative should be head of a household and if he or she was not available, next one in descending order will be chosen as a representative who has the following criteria:

The inclusion criteria will be as follows:

1. Between the ages of 15 to 65 year old both male and female.
2. Those who have an ability to answer the questions.
3. Those who have an experience of malaria attack within one year.

#### 4.3 Sample Size Estimation and Sampling Technique

Sample size was calculated based on the level of utilization of malaria diagnosis and treatment services by the community in the study area.

$$n = pq(z/d)^2$$

$$= 96.4$$

$$z = 1.96; d=0.1; p=0.5; q=0.5$$

The 98 persons from 98 households was selected to be interviewed.

n = minimal sample size  
 p = probability of level of utilization of malaria diagnosis and treatment services by the community.  
 q = probability of level of non-utilization of malaria diagnosis and treatment services by the community.  
 z = constant value of alpha error at the 5% level  
 d = proportion of acceptable error at the 10% level

Sampling frame was eight hamlets of Suan Phung District in Ratchaburi Province.

Sampling population will be the persons with the age of 15 to 65 year residing in the study area.

Sampling unit will be all eligible persons of both sexes with the age of 15 to 65 year residing in the selected households and who have at least an experience of malaria with one year. We selected the households purposively. Because we need 98 households out of 200 households. When a census was conducted in the study area to meet 98 representatives from 98 households who have all inclusion criteria, we found that there were round about 98 households that have at least an eligible person. We chose those households purposively as a sampling unit. It may be one of the limitations of this study.

#### 4.4 Field Procedures and Data Collection

This malaria service was established in June 1994 with a research team of the researchers and staffs from the Department of Tropical Hygiene, Mahidol University. Their main work is to conduct epidemiological research and collaborating with us to carry out economic aspects of malaria research. There is brief description on their works. During first to tenth of every month they perform the mass blood survey, clinical examinations and radical curative therapies of slide positive cases. They also collect the epidemiological (including incidence rate), clinical and parasitological data from almost all population of that defined area every month. During eleventh to the end of every month, they are working at the clinic for service and research works. We collaborated with this team to conduct the study on utilization of malaria diagnosis and treatment services in addition to their research works.

For collection of data, interviewing with structured questionnaire was conducted at private place in the household to ensure

confidentiality after having of informed consent. The interviewer went over the completed questionnaire with the respondent at the end of the interview in order to correct any inconsistencies. Pretesting was carried out before the actual interview. Four trained interviewers were used to collect the data. The questionnaires were translated into Thai and after collecting the data the responses were translated again from Thai to English. The questionnaire form is attached in the Appendix 7.

#### 4.5 Data Management

Before starting the interviewing of household respondents, all coding decisions were made before beginning to collect the data and the coding scheme is spelled out in a code book. The code book was also form the basic for editing(cleaning) the data. The data were recorded on the questionnaire forms at the time the interviews are made. Then the forms were hand edited while the study subject was still available. Omission, illegal entries, and gross errors that can be corrected on the spot were searched. Data entry was done using EPI-INFO software. Data collected were entered twice in the computer and checked for completeness, errors and inconsistencies.

Data analysis was carried out by using EPI-INFO, lotus and Micro TSP software. Construction of frequency tables and cross tabulations of variables interest was carried out for description of rate and pattern of utilization and maximum amount of willingness to pay in relation with their independent variables. The dependent variables are the level of utilization and the maximum amounts of willingness to pay. For the correlation between both dependent variables and independent variables multiple regression analysis will be employed. Relationship between utilization of those services and amount of willingness to pay will also be explored. Then magnitudes of relationship between dependent and independent variables will be searched by looking at the values of correlation coefficient and set the priority of determining variables according to impacts of their effects.

We also asked about utilization and distance in kilometers between home and formal malaria services. The nearest distance is one kilometer and the furthest one is 40 kilometers. The average distance is 5.3 Km. So they are categorized into rating scores from 1 to 3. Score 1 includes distances of 1 to 4 kilometers, score 2 has 5 to 10 kilometers distances and score 3 contains distances between 11 to 40 kilometers.

Relationships between utilization of those malaria services and species of malaria infection, presence or absence of debts, ownership of motorcycle, numbers of family members and children are shown in table 7. Regarding with malaria species, there are five categories of infection. They are falciparum, vivax, malariae, ovale and mixed infection.

Regarding with the willingness to pay, from the literature of provider cost of malaria diagnosis and treatment (Kaewsonthi and others

1988), we set the starting and the highest amounts of WTP in our questionnaire. For diagnosis of malaria the starting amount of money is 5 to 10 bahts for each episode the highest amount is 30 bahts. But for maximum amount of money there is a blank for putting the amount of money as much as they have willing to pay. We took the average amount, eg. 7.5 bahts if they chose the amount of 5-10 category. In case of WTP for drug treatment of malaria the starting amount of money is 10-20 and for both diagnosis and treatment the starting amount is also 20.

#### 4.6 Measurement of Variables

**Income of household (I):** Total cash income (baht) of a household per annum. It may be cash income (baht) of salary or wages, agricultural income and income from livestock sales.

**Availability of health care facilities (AOHF) :** Substitute facilities can be quantified in terms of number in relation to formal malaria facilities available in a given locality. The numbers of alternative facilities were counted in relation to a malaria clinic in the study area. For example, there are one hospital, one private clinic served by health assistant and the drug stores were assumed as 8 in numbers ( one for each hamlet).

**Perceived Quality of care (QC):** This can be measured using some grading based on the answers from the people. The following grading will be based on the regular availability of health personnel, dealing of health personnel, availability of drugs and faithfulness on diagnosis and treatment of those malaria services. In this case we have four criteria: (i) availability of malaria drugs; (ii) regular availability of staffs; (iii) good dealing of staffs; and (iv) confidence on the skill of staffs by the respondents. If the respondents say "yes" in all four criteria we give the score (4) and if they say "no" in all criteria we give the score (0). So there may be score (0) to (4).

Excellent (4), Good (3), Fair (2), Poor (1), very poor (0)

**Severity of illness (SI):** There may be three categories.

SI1 is Clinical malaria. It will have one or more of the following symptoms such as fever with or without chill and rigor, dizziness, vomiting, headache and bodyache. Rating score is (1).

SI2 is SI1 + one or more symptoms of complication such as easily fatigue, air hunger (dyspnoea), tightness of chest, jaundice, black color urine, swelling of face and legs and malaria with pregnancy. Rating score is (2).

SI3 is Cerebral malaria (loss of consciousness with or without fever). Rating score is (3).

**Convenience of travel (CT):** This depends on factors other than distance. Those factors are road conditions, transport facilities, etc.

It will be measured by length of time to reach the service point from home. Rating scale will be

1. Excellent (can reach the service point within one hour)
2. Good (can reach the service point within 1-3 hours)
3. Fairly good (can reach the service point within 3-6 hours)
4. Bad (it takes more than 6 hours to reach the service point)

**Distance (D) :** The distance (kms) between the service point and the residence of the patients.

**Incidence of disease (ID) :** The incidence is in term of cumulated incidence which is occurrence of new cases in given time interval per 1000 population within a defined area.

**Socio-demographic characteristics (DC):** It will include age, sex, marital status, education, occupation, number of family member, number of children in the family etc.

**WTP:** Is a measure in money terms which refers to the amount of money which is prepared to pay for malaria diagnosis and treatment service by the individuals.

**ATP:**It is a combination of total household income and the wealth. The wealth will be measured by value of assets (house, land, cattle etc), value of crops per annum, value of livestock per annum, cash expenditure on other goods per annum , value of used supportive materials for farming ( eg., fertilizer), saving and debts .

**Cost incurred by patients (C):** The costs incurred by patients will contain two parts. One is the direct and indirect costs of patients when they are seeking care at those malaria services. The second part is the costs of patients when they took the treatment before coming to those services and if they did not use the formal services.

In this case, the costs will be that of seeking treatment at the those services and that of seeking treatment from other facilities. They will be also asked about where they were taking treatment for malaria before establishing of this service. There will be two types of costs.

1. Cost incurred by patients while seeking care
2. Cost incurred by patients prior to seeking diagnosis and treatment services and if they did not use the formal services.
  - consultation fee
  - drug cost
  - time cost
  - travel cost
  - food cost
  - family related costs at other health facilities.