CHAPTER 4

The History of Malaria and Malaria Control in Thailand

Malaria is taken in this thesis as a pilot study related to information network development. Hence a summary of the Thai situation is given as background.

4.1 Magnitude of malaria problem in the world

Malaria is the most widespread parasitic disease in the world. According to the UNDP/World Bank/WHO TDR report (1985) in 1982, 365 million people, near one-twelfth of the world population, lived in areas where malaria was still highly endemic and where no specific anti-malaria measures were being applied. At the same time, nearly half of the world's population (2,217 million) were living in areas where malaria is still endemic but where control measures have reduced its level of endemicity to some degree. The most endemic areas are tropical Africa and Asia (Fernando, 1983). Over 80 percent of world's reported cases come from these two areas. In the 1979 world report, of the global total of 7 million reported cases, excluding Africa, 3.7 million and 2.7 million came from the WHO Southeast Asian Region and the Western Pacific Region, respectively.

Malaria is a serious disease which can cause morbidity and premature death. It contributes to a high rate of spontaneous abortion, low birth weight and malnutrition in affected areas. It is also a leading cause of death in high endemic areas, about 10 percent of all child deaths are caused by malaria (Galuay, 1987). Malaria also has adverse effects on the physical and mental state of the patient and on his vitality, stamina, ability to concentrate and to some extend, his innovativeness, curiosity and level of intelligence (Conly, 1975). Furthermore, malaria can reduce his economic productivity through absence from work and reduced work output, which in turn, reduces his income and standard of living. Malaria also has adverse effects on socio-economic development. It was estimated that the annual labour loss due to malaria was 171 million workdays in the agriculture population of India and 10 million workdays in Thailand (Werndorfer, 1980).

4.2 Basic Information of Thailand

Thailand is situated in the northern hemisphere between 5^{o} and 21^{o} N latitude, and 97^{o} and 106^{o} E longitude. The whole area is 518,600 square kilometers. At least 20 percent of the area of the country is covered by forest. The estimated population in 1996 is 60 million, and the annual population growth rate is

about one percent. The majority of the population are farmers. There were 73 provinces in the country in 1992, increased to 76 provinces since 1994.

Thailand has a tropical climate. There are two distinct seasons with only a slight change in temperature. The rainy season starts in May and lasts to October.

The Malaria Control Program is organized by the Malaria Division, Department of Communicable Disease Control (CDC) of the Ministry of Public Health (MOPH). The Malaria Division is responsible for the direction and implementation of the control program, staff, equipment and budget. There are seven branches under the Malaria Division for organization purpose: General Management, Laboratory Services, Vector Control, Health Education and Training, Epidemiology, Entomology and Applied Research.

At the country level, the program comprises five regions categorized according to the geographical location. They are Northern, Northeastern, Central, Eastern and Southern regions. Since 1991, the total area is divided into three operational areas comprising malaria control area, pre-integration area and integration area. In 1993, populations under these three areas were 41,450,407, 2,721,652 and 10,038,511 respectively. Control areas are those where transmission exists at least 6 months per year and areas without transmission but primary or secondary or suspected vectors are found. Pre-integration areas are district-wide areas that have been categorized as low risk for at least three years, and local health services are able to perform case detection, treatment and case investigation. Integration areas are provincial areas that have been pre-integration areas for at least three years and the Provincial Health Office is capable of managing all malaria control activities.

4.3 Malaria and Malaria Control in Thailand

As most countries in the tropics, Thailand confronts with the problem of malaria. Malaria is one of the leading causes of morbidity and mortality in the past. In 1947, the morbidity was approximately 286 per 1,000 population. It ranked within the top ten causes of morbidity. The mortality rate was 351 per 100,000 population in 1943 which was the leading cause of death in that year. Although mortality rate had decreased to 4.4 per 100,000 in 1983 and 2.1 per 100,000 in 1990, it still ranked sixth and seventh, respectively, among the ten leading causes of death in these years.

The Malaria Control Division in the Ministry of Public Health was established in 1943 in response to this serious problem. It was followed by a national malaria control problem in 1951, and a country-wide eradication program in 1964, with the assistance of WHO and other international organizations. The

major malaria control activities had been implemented such as residual house-spray with DDT and distribution of antiparasite drugs. Although the compliance rate with DDT spraying was not very high, many areas were cleared of endemic malaria and the malaria mortality rate decreased continuously as documented above.

Unfortunately, this trend was not maintained since 1970. The annual parasite incidence (API) increased from 2.2 in 1969 to 7.7 in 1977 (Gerberg and Graham, 1978). This increasing trend persisted for 10 years. There are several reasons for this resurgence of malaria. One is the restriction of financial support to maintain the program. Another is the ineffectiveness of malaria control operations in the border areas. The malaria control programs in the adjacent countries were not carried out effectively due to lack of good co-ordination. The mass influx of refugees across the border during the fighting which happened periodically led to an increase of malaria cases; indeed most malaria cases occurred in the border areas. Important factors reducing the effectiveness of malaria control programs are DDT resistance of Anopheles mosquitoes due to the extensive use of pesticides in agricultural activities, drug resistance of malaria parasites leading to difficulties in treatment, and changes in behavior of Anopheles mosquitoes leading to difficulties in vector control. These factors have significantly contributed the increase of malaria morbidity and mortality in these years.

Many malaria control activities have been applied in Thailand, including public information, mobile health education units, surveillance, anti-vector measures, anti-parasite measures, entomological activities and epidemiological evaluation. Residual house-spraying with DDT has been conducted in order to reduce the transmission rate in control areas. Blood examination, presumptive treatment and radical treatment are carried out in the whole country with the intent to interrupt transmission and to reduce the risk of death. Public information activities and health education are aimed at increasing public awareness and improving community participation and personal protection. They take the form of mass media communication including public exhibitions, radio, television, newspaper coverage, posters and so on. Moreover, thousands of health village volunteers throughout the country are also assisting the malaria control activities by searching for malaria cases, taking blood smears, providing presumptive treatment and encouraging the co-operation and participation of the community. Through all these efforts, very encouraging results have been achieved. Case incidence throughout the country has been markedly reduced during the last four decades. The morbidity rate has reduced from 286 per 1000 population in 1947 to 1.9 per 1000 population by the year 1994. The mortality rate reached the lowest historic level of 1.7 per 100,000 population in 1993. It dropped in rank from the top ten in the past years to the thirteenth cause of death.

However, the malaria control program has been also faced with some problems in these years. For example, the compliance rate of DDT house-spraying is quite low in some remote areas. In 1981, only 61 percent of total target structures were completely sprayed, and 32 percent were incompletely sprayed, often only underneath the house (MOPH, 1982). The main reason for the low compliance rate was the refusal by residents because of DDT's bad smell, its harmful side-effects especially to pregnant women, children, sick people and pets and DDT residuum causing the roof to rust or rot (Ranyajim, 1988)

The low utilization of malaria clinics is another problem. Although government provides treatment free of charge at malaria clinics, only 43.4% of cases sought care at these clinics, 37% went to government hospitals and health centers, 12.2% got self treatment by buying drugs in the market, and another 7.4% went to private clinics, traditional healers and malaria or health volunteer (Ranyajin, 1988).

Incorrect behavior is also a major problem. In the remote areas, people do very little to protect themselves from contracting malaria even they know how to do it. Ranyujin (1988) showed that, in some areas of Kanchanaburi and Suphunburi, only 52.8% of people were sleeping in mosquito nets every night, whereas about 26.5% had never used them, others used nets irregularly. Additionally, the use of mosquito repellents was very low. Only 42.1% of people had used them.

All of these problems influence the effectiveness and success of malaria control programs. They need to be considered in the planning of future malaria control measures, in order to achieve the objectives.

According to the Seventh Five-Year National Health Plan (1992-1996), the objectives of malaria control were expected to reduce the morbidity and mortality due to malaria to be of minimal public health importance, and to prevent the re-establishment of malaria into the integrated areas. The specific primary objectives were set as follows:

1) to reduce malaria morbidity rate to 1.5 (or less) per 100,000 population by 1996.

2) to reduce malaria incidence rate (API) to 3 (or less) per 1,000 population by 1996.

3) to prevent the re-establishment of malaria transmission in the eradication areas (where the malaria control program has been integrated into the local health services) and to keep the incidence of indigenous cases in such areas below 1 per 100,000 population.

4) to eliminate malaria transmission and prevent the re-establishment of transmission in 14 of the(Thai) 73 provinces.

The following Chapters will discuss the theoretical framework for developing a dynamic model in relation to the analysis of social, economic and health determinants of malaria incidence, and of assessing the economic efficiency and equity in health resource distribution in health policy planning.