CHAPTER 3

LITERATURE REVIEW

Significant literature is concerned with five issues:

* The importance of cost analysis
* Economic costs of malaria
* The costs of care from consumer and supply side
* The methods of cost allocation
* The previous work on cost analysis of malaria control

3.1 The Importance of Cost Analysis

Economic analysis is recognized as an essential tool for decision-making in many areas, such as business and industry, this can be said to be currently the case in health, especially in developing countries. When the resources to be deployed in health are limited, it is all the more important to use economic tools.

The arguments for costing health projects and programs have been thoroughly discussed by Phillips (1987). But since then, the vital importance of cost analysis has become increasingly recognized worldwide, perhaps even more so in less developed countries and much work has been done (Brinkmann et al , 1988; Rohde et al, 1989; Phillips et al, 1991; Bundy et al, 1992). All too often, a rational scheme for a disease surveillance program does not always match decision-making by bureaucracies, which is often politically manipulated. Therefore, calculations of costs would make information regarding feasibility of projects and schemes available, and produce efficient choices for alternatives. These calculations could also provide essential techniques for later, more complicated cost-effective and cost-benefit analyses, both of which would explore the nature of the alternatives with their negative or positive consequences. The most important initial requirement for a project, program or scheme is for all parties concerned to decide which alternative could be implemented with the available funds, and to be aware how much input is required for the desired output.

Malaria is a serious tropical disease among people from the lower socioeconomic class, therefore, cost is a significant barrier in malaria control. Obviously, it is important to understand the cost incurred by the provider for providing the malaria control services such as case detection, treatment and prevention , and the cost incurred by the community due to showing up to get the service and losing income due to the illness.

Most countries within malarious regions have in place some institutions designed to address cost analysis. The activities which are undertaken by these institutions depend partly on the local needs but also on history, cultural acceptability, and political concerns. The most practical use of cost information is its ability to assist the managers of the local malaria public health facility to make better incremental decisions in environments where they are constrained. Costing analyses in these cases can greatly improve allocation divisions by managers. A good example of this use is the work done by Kaewsonthi and Harding (1988) in Thailand and Mills (1987) in Nepal. In these studies, comparisons between different approaches to detect the malaria cases were made clearer by careful costing procedures at local levels, and practical recommendations for implementation were made. Mills, for example, was able to suggest a reduction in active case-detection methods and an increase in malaria clinics (or other treatment facilities), observing that either of these activities appeared to be better than spraying.

3.2 Economic Costs of Malaria

The costs of malaria include the impact of the disease on the economy and economic development, on the local community, on the household, and on the individual.

Illness or death can cause the loss of resources and human capital. The costs that malaria imposes are borne through increased mortality and through high morbidity rates. The effect of mortality will vary with the age distribution of deaths, which in turn vary by ecological zones. In highly endemic areas, malaria deaths occur primarily among infants and young children. In low to moderate endemic areas, malaria deaths occur among the primary bread-winners or caretakers (Hammer, 1993). The effect of mortality is obviously different.

Public health activities have been justified as improving management of disease that impairs productivity. Malaria is a classic example of a debilitating disease that impairs productivity. Much of the research has concentrated on measuring the effects of bouts of illness in reducing productivity and output of workers. Reviewed by Barlow and Grobar (1986), days of disability per case of malaria estimated in several studies range from five to twenty. Families with malaria cleared only 40 percent as much land for crops as similar families without malaria. And a variety of adjustments in farm families afflicted with malaria, including increase in labor input by healthy family members per unit of output as well as reallocations of land and hired labor. This increase may be seen as an ameliorative factor in that it reduces the net effect of the disease, but it may also be seen as simply spreading the costs of the disease to others besides those who are ill.

3.3 The Costs of Care from Consumer and Supply Sides

The control intervention for malaria includes: management of clinical malaria - diagnosis and treatment; vector control - residual spraying; environmental control - drainage and source reduction, larviciding, biological control; surveillance - epidemiological surveillance, monitoring epidemic risk; health education. One of the most common antimalarial measures is the treatment of fever cases with antimalarials which continues to be the practice in many malaria control programs.

Disease prevention and treatment can drain a substantial amount of economic resources. Economists define cost as the value of resources used to produce goods or services, including a specific health service or a set of services (Creese and Parker, 1991). For the sake of convenience and comparability they are usually expressed in terms of money. This should not obscure the fact that this money actually represents real resources used up. Costs are not the same as prices, which reflect a market rate of exchange. Some actions may have costs which have no price or market value, while others have market prices that do not reflect the resource implications to society of an action .

In determining the costs of any action, it is important to identify all activities in which the costs arising, and on whom they fall. What the viewpoint for the analysis is will specify an item which may be a cost from one point of view, but not a cost from another (Drummond, et al, 1986). Providing the service for malaria passive case detection may incur costs for the health service, for instance, in the form of antimalarials and personnel; the individual in the form of charges, transport costs; the individual's family in covering for her absence.

In order to provide the control intervention for malaria, the costs incurred by the health provider may be classified by the activities such as case detection, vector control. To estimate the provider's costs for case detection, the cost components may be classified by inputs: capital costs - those that last longer than one year and recurrent costs - those that are used in the course of a year and are usually purchased regularly. The former usually include: vehicles, equipment, buildings, non-recurrent training etc. For the latter, the following are included : all types of personnel, supplies, vehicles and building operations and maintenance, recurrent training and so on (Creese and Parker, 1991).

The total costs borne by families and individuals due to malaria include payment for treatment, time and transport costs in seeking treatment, time costs for family members who look after the patients, and the time and monetary costs of preventive action. In a careful study of Thailand, Kaewsonthi (1988) attempted, among other things, to measure the costs borne by patients in seeking care. These amounted to $20 per positive case, or nine times the average wage. These represented 15 percent of the costs per positive case and are a

component of the full cost to those who do not seek formal treatment.

The sum of these costs incurred by the community is only a lower limit because those who seek treatment reveal by their actions that they prefer to bear these costs rather than suffer the disease. The true costs of the disease exceed the costs of seeking treatment for two reasons. First, there is pain and suffering before treatment is sought. The cost of pain and suffering is intangible (Drummond, 1986). Second, there are people who have decided that the costs of seeking treatment are too high relative to letting the disease run its course.

3.4 The Methods for Cost Allocation

If a particular input is used only for the alternative being studied, then the entire cost of it can be assigned to that alternative. However, in most instances, peoples, buildings, vehicles and drugs have multiple functions. So, it is necessary to identify which inputs are shared by other activities. In these situations, a reasonably accurate way of dividing their costs among their various uses and assigning the proper to the alternative being studied is needed.

Various methods for allocating shared costs (or overheads) are available, namely : direct allocation (ignores interaction of overhead department), this method would underestimate the costs in all final cost centers; step down allocation (partial adjustments for interaction of overhead departments); step down with iterations (full adjustment for interaction of overhead departments); simultaneous allocation (full adjustment for interaction of overhead departments), this method is the complete one to allocate the shared costs (Drummond, et al. 1986).

With manpower, the aspect of allocating costs appropriate to their contribution to a studied activity is time (Phillips, 1989). But in some cases it is considerably more difficult to allocate the costs of the manpower. Because records of time which manpower spend on different tasks are rarely available and the manpower themselves may have difficulty estimating the time they spend on related activities. But were the period of the research long enough, a special pilot survey may be possible. The direct observation may be imagined as an accurate way of measuring the time. However, very unfortunately, it is impractical, because this kind of work itself usually is difficult to carry out and time-consuming, cost-consuming with the limited research time and research funds.

So usually a substitute is used. Since the amount of time that manpower are occupied increases with the number of patients visits, so the percentage for studied visits could be used as the basis to allocate the related manpower costs. In our case, we measured what proportion of the total internal-medicine and the total outpatients

visits were by patients with clinical diagnoses of typical malaria, suspected malaria and FUO. The assumptions made here are that a visit for fever has involved the same amount of manpower time as visits for other internal diseases and approximately the proportion of manpower time is spent on diagnosing and treating the fever patients concerned.

But, allocating the costs of the manpower in this way means the exact contribution of the manpower to the activity of interest is not measured, because a proportion of the nonproductive time is also included. So the costs of the manpower contributed to the activity will be underestimated.

3.5 The Previous Work of Cost Analysis of Malaria Control

With respect to the cost analysis of malaria control programs, some work has been done. The studies vary enormously in terms of the circumstances of the study and include small-scale studies, such as those of Ettling et al (1991) or national malaria control programs (Kaewsonthi, 1983).

In their study, Kaewsonthi and Harding (1983, 1988) carried out a series of analyses of costs and performances of malaria control, including performance of operational services, performance of laboratory services. An outpatient visit by a suspected malaria case cost approximately 45 Baht, the total cost of a malaria outpatient visit to the hospital was approximately 127 Baht. These figures included the cost for laboratory services and treatment.

Ettling et al (1991) reported in their research on Thailand, that the average institutional cost per slide examined was 4.37 and 7.03 Baht in central and peripheral clinics, respectively. The average institutional cost per positive case was 20.85 and 40.21 Baht in the two kind of clinics, respectively. But the cost of drugs was not included. When they broke down the costs, in terms of cost per slide, manpower costs were 3.75 and 5.92 Baht (86%, 84% of total costs), supplies costs were 0.20, 0.20 Baht (5%, 3%), respectively in the two kinds of clinics.

In her study in Nepal, Mills (1987) assessed the costs per slide were 12.24, 31.72 Rs, while the costs per positive case were 149, 4546 Rs at the district level in terai and hill areas, respectively for passive case detection by malaria clinic. The variation of the costs was due to the difference of the cost profiles and the different malaria situations. However, she did not assess the cost per slide or cost per positive case diagnosed in hospital.

In the studies of Kaewsonthi (1988) and Ettling (1991), the manpower costs were determined from the accounts and allocated to certain activities on the basis of activity logbooks kept by the staff of the health service points. But in some cases over 50% of a person's time was unclassified. When costing activities, it was distributed in proportion to the time which was already assigned to activities, so this raises the costs of activities (Kaewsonthi, 1989) In the study of Ettling (1991), costs of supplies were calculated from headquarters and zone records by multiplying the cost per slide by the number of attenders at each clinic.