

CHAPTER 1

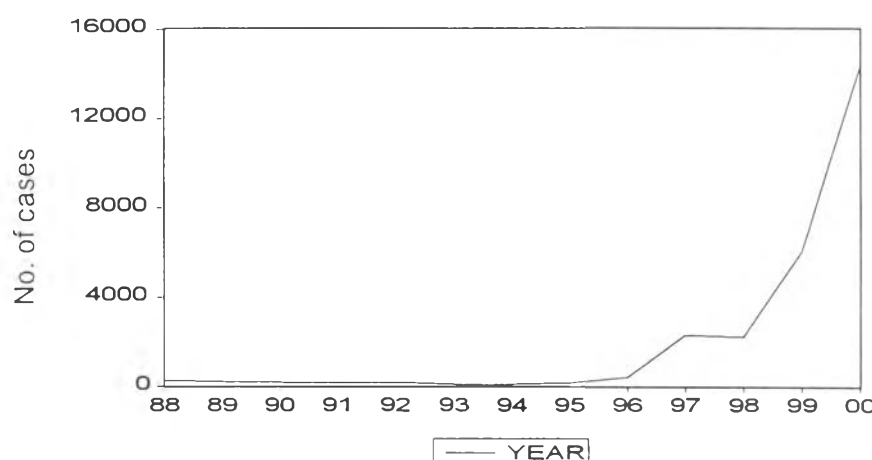
INTRODUCTION



1.1 Rationale

Today, leptospirosis is a health problem of growing importance, since its incidence has increased markedly since 1997. It was an endemic disease with 10-20 reported cases annually during the years 1972 – 1981, and it has increased gradually, ranging from 55 – 272 cases between 1982 – 1995, reflecting an overall incidence rate of approximately 0.3/100,000 population. Since 1997, the numbers of reported cases have dramatically increased, from 358 cases in 1996 to 2,334 cases in 1997, 2,226 cases in 1998, 6,080 cases in 1999 and 14,285 cases in 2000. This represents incidence rates of 0.60, 3.84, 3.62, 9.65, and 23.13 per 100,000 population, in 1996, 1997, 1998, 1999 and 2000, respectively (Figure 1-1).

Figure 1-1 Yearly reported cases, 1988-2000.



Sources: Division of Epidemiology, Annual Epidemiological Surveillance Report 1988 - 2000, (Bangkok: The War Veterans' Welfare Organization Press; 1988-2000).

In the aftermath of a disease epidemic, the expenditure on health care, which is supplied meagerly, will be increased. For the most efficient use of these scarce resources, prevention — an effort to reduce the risk of infection — might alternatively be instigated as a solution to the problem, as it is believed by many to be less expensive than cure.

Leptospirosis is an acute occupational zoonotic infectious disease caused by *Leptospira interrogans*. The organism is transmitted to the human body through damaged skin contacting water. In Thailand, it particularly affects rice farmers because their legs and feet have accidentally cut skin, and are constantly immersed in wet fields for more than 6 hours each day (Tangkanakul et al, 2000, Silawan et al 2000).

Wearing of protective boots is recommended to be the most appropriated preventive measure. Its potential for prevention has been identified through a case-control study as 7.1 times if compared with doing nothing (Tangkanakul et al, 2000). If this is so, what are the significant costs and benefits?

1.2 Research question

What are the costs and benefits of providing protective boots to farmers in the fiscal year 1999-2000 (October 1st, 1999 - September 30th, 2000)?

1.3 Research objectives

A. General objective

To analyze the costs and benefits of providing protective boots to farmers in the fiscal year 1999-2000.

B. Specific objectives

1. To estimate the number of cases associated with conditions of infection: with the protective boot program and without the protective boot program.
2. To estimate the number of cases associated with each level of disease severity: mild, moderate and severe.
3. To estimate the average treatment cost per case associated with each level of disease severity.
4. To estimate the average cost per pair of the protective boots to be distributed to farmers.

1.4 Scope of the study

1) Leptospirosis affects rice farmers and Sa Kaeo Province has been affected by this problem. The province has sporadic cases, which have ranged from 1-6 cases annually during the years 1996-1999. In the year 2000, the number of cases dramatically increased to 133 cases, with 4 deaths. The study population and area for this analysis is therefore confined to 149,236 rice farmers in Sa Kaeo Province (Please see pages 31-32 for detail).

Figure 1-2 Study area.

Thailand



2) There are normally three viewpoints for economic analysis: provider, patient, and societal. In this study, the viewpoint of the provider is used for analysis and to determine the eventual result.

3) Economic evaluation of health services: CBA and CEA

Cost benefit analysis (CBA) is an extended form of cost effectiveness analysis (CEA): fully analyzing a program's cost side and using health care cost translate the program's consequence such as lives years prevented, cases prevented into financial terms to justify the cost. It is useful when a decision on a single program will be made. However, it is seriously flawed because of the indirect benefit: the different earning between gender is not taken into account, the elderly may be considered not to have monetary value once they have stopped working. Consequently, the true production gain is underestimated.

(a) Measuring cost

There are mainly two categories of cost incurred by a health care program (1) direct cost: organizing and operating costs incurred by the provider in providing a health care program. These include the costs of operating supplies, medical supplies, equipment and its maintenance, land, buildings, and the time of health care professionals. (2) Indirect cost: out-of-pocket expenses, time off work, pain, grief and suffering incurred by patients and their families in obtaining the program.

The protective boot program is primary prevention of health care services. Its aim is to prevent healthy farmers fall sick with leptospirosis. Its consequence is that the farmer able to earn. The protective boot costs composed by the two cost categories are

(1) Direct cost consisted of nursing time and financial outlays for providing the protective boots and the adverse health effects of the protective boots. These are treatment costs and follow up for the infections resulted by the protective boots.

(2) Indirect cost consisted of cost in time, financial outlays and dislocation of the farmers and their relations in getting the protective boot, and the cost due to pain, grief and suffering of the patient and their families caused by using the protective boot.

In this study, only direct costs are measured.

(b) Measuring benefit

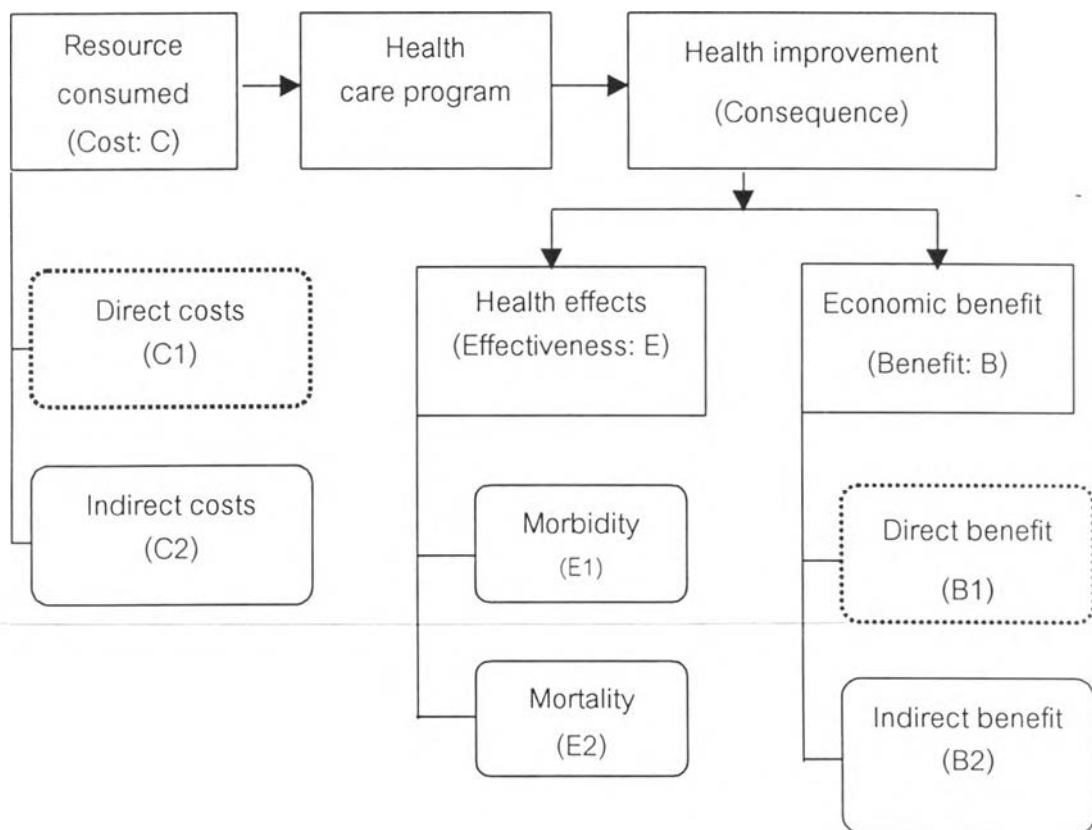
There are mainly two categories of health care cost to be accounted for benefit (1) direct benefit: reduction in medical care costs incurred by the provider in providing the health care for the cases and deaths. (2) Indirect benefit: increase in income able to be earned due to a reduction in sick days, reduction in pain, grief and suffering incurred by patients and their families in obtaining the health care program.

(1) Reduction in medical care cost. This hardly constitutes the primary justification for health improvement and contains considerable bias. Many diseases are less costly to treat when care is given early in the course of the disease or the treatment is provided correctly the first time. Similarly, the least expensive way to treat heart attacks may be never to attempt resuscitation. A transplant may mean ten more years of life for the patient, but it will certainly mean hundreds of thousands of dollars in additional care.

(2) Increase in income able to be earned due to a reduction in sick days. This is a primary measure of health improvement. It is relatively simple to obtain the relevant data from existing labor statistics, but it is a biased measure because the different earnings between the genders is not taken into account. In addition, the elderly may be considered not to have monetary value once they have stopped working. However, the gains are measured fairly precisely.

In this study, only direct benefit is measured to justify the cost. A framework for economic evaluation in this study is as attached.

Figure 1-3 A framework for economic evaluation



Note --- show the cost and benefit measured in this study.

4) All the costs are measured in Thai Baht in the year 2000.

5) Medical care cost provider consisted of routine service costs (RSC) and medical care costs (MCC).

(a) The routine service costs are divided into two categories: routine service cost per OPD visit and routine service cost per IPD patient-day. For this study, both are the results from the health facility unit costs analysis entitled "Unit Cost Analysis of Public Health Facilities in 6 Provinces, Fiscal Year 2000, Under the Social Investment Project (SIP)" conducted by Tisayathikom and Thonimitr (2000). The study is considered to possess a sound methodology, and provides all the cost information needed in this study: RSC at provincial hospital level, and RSC at health center level.

(b) Medical care costs

(1) Treatment and follow up, the data for estimation were drawn from 30 purposively selected leptospirosis patients hospitalized at Sa Kaeo Crown Prince Hospital. The method used to estimate the cost was adjusted charge costing method.

(2) The direct protective boot, the data for estimation was drawn from the routinely financial report, Office of Leptospirosis Control, Department of Communicable Disease Control, year 2000. The method used to estimate the cost was cost absorption costing method.

1.5 Expected benefits

It is anticipated that the results of this study will benefit planners in considering the costs and benefits of a protective boot program, which is beneficial to farmers, before implementation. According to the outcome of this study, the objective of preventing the farmers contracting leptospirosis by wearing protective boots while working in a rice field would simultaneously be aimed at decreasing health care costs.
