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## Economic Analysis of Health Projects: A Case Study in Cambodia

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## Foreword

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## Table of Contents

Abstract	vii
I. Introduction	1
II. The Project and its Rationale	2
III. Economic Analysis	3
A. Least Cost Analysis	3
B. Calculation of the Economic Internal Rate of Return	4
C. Preliminary Assessment of the Incidence of Benefits	9
IV. Financial Sustainability of the Health Sector and Project	10
A. Fiscal Sustainability	10
B. Project Sustainability	13
V. Conclusions	13
References	14

## **Abstract**

The economic analysis of health projects has not received the attention that projects in other sectors have received primarily because of perceived difficulties in quantifying economic benefits. However, there is a misconception that economic analysis is a simple calculation of an economic internal rate of return. Rather, it envelops a broader range of issues that includes the rationale for the project, cost effectiveness, demand for the project output, economic viability, sustainability, and equity considerations. The purpose of this technical note is to present an example of an approach to the economic analysis of a health project that may be used as a guide for future projects. It is based on an actual health project approved by the Asian Development Bank for Cambodia that will be implemented over the period 2003-2006.

## I. INTRODUCTION

Health and physical well being are essential to the formation and maintenance of human capital and are key components for economic growth and sustained poverty reduction. However, maintaining health is not free and requires significant public and private investment. Since resources are scarce, developing countries like Cambodia have to ensure that the right investment decisions are made from an economic point of view. Interventions in health, as well as other sectors, should be as efficient as possible, maximizing benefits and minimizing costs. Careful consideration must also be given regarding which parts of the population will be the ultimate beneficiaries of the investments. The economic analysis of projects has an important role to play in making these decisions.

An economic analysis is an important part of the planning process and the ultimate implementation of a project. The process normally begins with ideas for projects that emerge from an assessment of the sector. The sector assessment establishes the rationale for the project and suggests alternative solutions to the identified problems. Thus, the next step in an economic analysis is to identify the least cost alternative from this set of technically feasible projects. When the least cost option is identified, it is then subjected to a full benefit-cost analysis to calculate economic internal rates of return and net present values for comparison with other projects in the health and other sectors. The benefit-cost analysis is key to the efficient allocation of scarce public investment resources across all sectors.

There is usually no guarantee that the economic benefits of health projects will be realized over the life of the project. Therefore, a financial analysis of the health project is also required to ensure that the project contributes to the financial soundness of the implementing agency and that the project will continue to operate satisfactorily over its life. For revenue-generating projects, financial internal rates of return are usually calculated and the financial statements of the implementing agency are analyzed.

However, many kinds of projects including those in the health sector supply public goods that are financed by the government from its budget. The project is often not revenue-generating and the implementing agency is likely not organized along commercial principles. Therefore, an analysis of public expenditures is critical for determining the sustainability of the project in terms of its role in the health sector, in the overall budget process, and in terms of current and future priorities. The analysis of public expenditures should therefore comprise the following principal features. The analysis should present the trends in the level of total public expenditures and share of the budget over time. These numbers may be presented in per capita terms for comparison with other countries in the region. This is followed by an analysis to describe the resource allocation within the health sector across major expenditure categories. With a good understanding of current public resources allocated to the health sector, the analysis proceeds to forecast how budget allocations to the sector are likely to change in the future based on past trends, government priorities, and perceptions of government officials.

This technical note presents an example of how an economic analysis may be undertaken for a health project incorporating the above principles, consistent with the method outlined in the *Handbook for the Economic Analysis of Health Sector Projects* (ADB 2000). It is based on the Cambodia Health Sector Support Project (Loan 1940-CAM[SF]), approved by the Asian Development Bank (ADB) on 21 November 2002 (referred to hereafter as "the Project"). The technical note discusses the

rationale for the Project, reviews its economic contribution to the health system, and investigates the overall sustainability of the health sector and the effect of the Project on beneficiaries and the Government of Cambodia's long-term fiscal position.

## II. THE PROJECT AND ITS RATIONALE

There is a strong economic rationale for investing in health, especially for expanding primary and basic secondary health care to areas where it is almost nonexistent. Cambodia's health indicators are among the worst in the Asian and Pacific region. Average life expectancy at birth is estimated at only 56.4 years. Infant mortality is estimated to be 95 per 1,000 per live births, while the mortality rate under the age of 5 is 124 and the maternal mortality rate is 437 per 100,000 live births (Cambodia Demographic and Health Survey 2000). Rates of malnutrition are the second highest in Southeast Asia with an estimated 56 percent of children under 5 affected by chronic malnutrition. Moreover, progress in improving these health indicators has been slow and, in some cases, for example infant and child mortality, the rates appear to have increased in the 1990s.

Health care is often characterized by asymmetrical information with respect to medical interventions. This is especially true in Cambodia, where education levels of patients are low and people often do not know about even basic health practices, such as emergency obstetric care and child health. In many areas, private, unregulated health services are the primary source of health care. The lack of regulation and consumer information often puts the health of patients at risk and drives up the cost of health care. Publicly provided health services can help bridge the gap and provide information about good health practices and alternatives in health care.

Credit markets are weak in Cambodia and health insurance is virtually nonexistent. A health crisis in a household can lead to a household financial crisis and, for the 80 percent of the population that lives near or below the poverty line in Cambodia, the threat of such a crisis is ever present. Thus, a formal and transparent fee system for health care reduces uncertainty of health care expenditures and protects the poor from the burden of health care costs. At present, virtually no protection exists for the poor but, with a formal system, it is possible to establish fee exemptions and social protection funds and, eventually, insurance schemes to protect households in the event of an unexpected health crisis.

A lack of trained health care providers is a key constraint to improving the health care workers' performance and providing services to the poor. Many public rural facilities have staff shortages that limit access to general and specialized health services. Remote health centers are seriously understaffed in midwifery and reproductive health services. A large proportion of health providers lack necessary curative and preventative skills to provide effective health care. The lack of trained health care providers is compounded by the poor capacity to effectively plan, manage, and finance the health sector. As a result, poor Cambodians have largely not benefited from available health services.

Investment in primary health care in the remote areas of a developing country has a positive impact not only on poverty but also on health equity. According to Sen (2002), health equity is a central feature of "fairness and justice in social arrangements." It is not concerned only with health in isolation in terms of the distribution of health or the distribution of health care. Fairness and justice in social arrangements also include consideration for economic allocations and the role of health in human life and freedom. The provinces where the Project will be implemented are among the poorest in the country and generally have worse health and nonmonetary indicators of poverty than the national average.



To address these issues, the Health Sector Support Project's objective is to improve health, especially of women, children and the poor in targeted regions of Cambodia. Specifically, the Project aims to:

- (i) develop affordable, quality, basic curative, and preventative health services for the population, especially for women, the poor, and the disadvantaged;
- (ii) increase the utilization of health services, especially by women and the poor;
- (iii) control and mitigate the effects of infectious epidemics and of malnutrition with emphasis on the poor and disadvantaged; and
- (iv) increase the institutional capacity to plan, finance and manage the health sector in line with the Health Sector Strategic Plan 2003-2007.

The Project's scope consists of three components:

- (i) buildings and civil works, medical and auxiliary equipment, training of health service providers, contracting of services to nongovernmental organizations, and supplies and drugs;
- (ii) support programs addressing public health priorities such as the control and prevention of communicable diseases and safe motherhood, immunization and nutrition programs; and
- (iii) strengthen institutional capacity in management, planning and evaluation at the national, provincial and district levels.

In the contracting of services to nongovernmental organizations, two approaches are available. Under the contracting-out model, the contractor has full responsibility for the delivery of specified services, directly employing staff, and has full management authority and accountability for the achievement of specific targets. The contractor has full control over resource allocation and disbursement. Under the contracting-in model, contractors provide only management support to the civil service health staff, with recurrent operating costs provided by the government through normal channels. Contractors have full control over allocation and disbursement of the budget supplement, but are obliged to follow government rules and regulations with respect to the government-supplied resources. Contractors have management authority over staff but do not directly employ them.

### **III. ECONOMIC ANALYSIS**

#### **A. Least Cost Analysis**

Quantitative economic analysis normally begins with comparing costs in relation to health impacts from different project alternatives. The general procedure requires specifying alternative incremental project impacts (the difference between a health outcome with and without a particular project) and comparing this with incremental costs, both streams appropriately discounted. In the case where incremental project impact is the same for all project alternatives, only incremental costs need

to be considered. Box 1 provides a general framework for undertaking a least cost analysis of a health project.

**Box 1: Steps for a Health Sector Least Cost Analysis**

**Step 1: Identification of the Objective of the Intervention**

- Establish clearly and in detail the objective of the intervention
- Identify the scope of the intervention in general terms

**Step 2: Collection and Preparation of Cost Data**

- Identify the range possible interventions to achieve the given objective
- Obtain financial cost data from reliable sources on all inputs for each mutually exclusive, technically feasible project alternative
- Disaggregate the cost data in terms of tradable and nontradable goods or services, and taxes and duties
- Derive economic costs of project alternatives in constant prices from the financial cost data through appropriate shadow pricing

**Step 3: The Least Cost Analysis**

- Determine the social cost of capital in real terms
- Using the social cost of capital, discount the stream of economic costs over the life of the project alternatives to arrive at net present values
- Calculate the equalizing discount rate of the two lowest cost alternatives
- Determine the least cost alternative and make recommendations

The least cost analysis of the Project was based on the results of a pilot project in five districts in Cambodia (see Keller and Schwartz 2001 ).<sup>1</sup> The pilot project engaged several nongovernmental organizations to manage the local health system using two different management models—contracting-out and contracting-in. Other areas under the pilot project were served in the usual government-provision approach. These three approaches to providing health care services are the range of possible alternative interventions that could be employed. The impact of the contracting approaches was subsequently evaluated by comparing these approaches with the government provision model. It was found that the contracting approach was the most cost effective and that significant improvement in health care services in the contracting areas over the government provided ones was achievable. Thus, this was the basis for using the contracting approach in providing primary health care in the districts covered by the Project.

## **B. Calculation of the Economic Internal Rate of Return**

### **1. Economic Benefit Assumptions**

The Project supports the Cambodian health system's efforts to improve the health status of the population. Some of the economic benefits of the Project are quantifiable in economic terms and may

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<sup>1</sup> The pilot projects were financed by an earlier ADB project in the country, Loan 1447-CAM(SF): Basic Health Services approved on 20 June 1996 for \$20 million.

be broadly divided into two categories: resource cost savings and productivity gains. Resource cost savings consist of a reduction in out-of-pocket expenses for health care as a result of reforms in health financing. Productivity gains are the result of less time lost to illness that would have otherwise been utilized in some economic activity. Productivity gains are also realized when less time is spent for the care of sick family members, as well as better learning outcomes of children who will eventually join the labor force. Numerous studies have shown that improvements in health have a significant effect on the population's productivity (for example, Dasgupta 1993, and Strauss and Thomas 1995). This is true for people working, both within and outside the home, and studying. There have been few studies done in Cambodia on the relationship between health status and productivity. Therefore, this analysis does not attempt to quantify all economic gains and only provides conservative estimates based on benefit streams that can be quantified.

Table 1 provides the assumptions used in the calculation of the economic rate of return under alternate scenarios based on the evaluation of the pilot project referred to above. Details of the measurement of the economic benefits and costs that form the basis of these assumptions may be found in Keller and Schwartz (2001) and Bhushan, Keller, and Schwartz (2002).

**Table 1: Economic Benefit and Cost Assumptions  
under Alternate Scenarios**

	<b>BASE CASE</b>	<b>LOW PARTICIPATION IN THE PROJECT</b>	<b>FEWER SICK DAYS REDUCED</b>	<b>LESS OUT-OF-POCKET EXPENSES SAVED</b>
Reduction of per capita out-of-pocket expenditures in contracted areas	\$6	\$6	\$6	\$6
Reduction of per capita out-of-pocket expenditures in noncontracted areas	\$4	\$4	\$4	\$0
Reduction of per capita days lost due to illness in contracted areas	2.3 days	2.3 days	1.2 days	2.3 days
Reduction of per capita days lost due to illness in noncontracted areas	0.8 days	0.8 days	0.4 days	0.8 days
Population benefiting from the Project in year 3	20%	15%	20%	20%
Population benefiting from the Project in year 4	40%	30%	40%	40%
Population benefiting from the Project in year 5	60%	45%	60%	60%
Population benefiting from the Project in year 6+	80%	60%	80%	80%
Maintenance cost per dollar of investment	\$0.15	\$0.15	\$0.15	\$0.15
Economic value of time (daily)	\$0.75	\$0.75	\$0.75	\$0.75

The evaluation shows that supporting the health care system will lead to a decrease in out-of-pocket expenditures for health services along with improvements in health status. This is not unexpected given the current dependence on pharmaceutical products that are often wrongly prescribed and misused, and the high use of low quality unregulated health services. As a result, spending on health care is inefficient because of a lack of information, provider accountability, and a disorganized health system. For areas that have been participating in the contracting pilot project, the positive effect was more pronounced. The base case assumes that out-of-pocket spending on health care is reduced from \$22 per year to \$16 per year in contracting districts (a savings of \$6 per person per year) and to \$18 per year in noncontracting districts (a savings of \$4 per person per year). Given the low level of income in Cambodia, this represents significant savings for many households.

Time is valued at \$0.75 per day based on prevailing wages. This value of time is assumed to be constant for the entire population, whether they work outside the home, study, or work at home. This is consistent with the practice of valuing the life of people who do not contribute financially to the household. It also reflects the contribution that the "nonworking" population makes to household welfare and is based on the premise that work in the home is a substitute for work outside the home at the prevailing wage.

Improving the health status of the population will lead to fewer days lost due to illness and fewer days needed to take care of ill relatives than without the health interventions introduced by the Project. The base case assumes that in contracting districts, an average of 2.3 days per year will be gained per capita due to more efficient treatment and better availability of services. In other districts, the gain is assumed to be only 0.8 days per person-year. At the prevailing wage of \$0.75 per day, the monetary value of the productivity gain is \$1.73 and \$0.60 per person-year, respectively.

As the Project begins operations, there will be relatively few new beneficiaries. However, with time, the number of people who benefit from the project will increase. The Cambodian health system is organized around districts that are designed to give relatively equal access to the population, based on distance and population density. The Project is also targeted in areas where the formal health system is not functioning. Thus, investments will be well placed to ensure broad access.

The base case assumes that in the first two years of the Project, there are no new beneficiaries. In the third year, 20 percent of the target population benefits from the project, increasing to 40 percent in the fourth year, 60 percent in the fifth year, and 80 percent in all subsequent years. These estimates reflect the time required for the investment from the Project to reach the local level. Evidence from the contracting evaluation suggests that contracting starts to have a positive effect on the health system within six months and therefore these assumptions are conservative.

## **2. Economic Cost Assumptions**

The Project will require additional resources to cover operating and maintenance costs. It is assumed that for each dollar spent on investment, an additional \$0.15 per year is spent on maintenance and providing basic supplies to new facilities. Recurrent costs associated with the purchase of new drugs and supplies are also included. Training leads to an increase in wages and subsequently to higher recurrent costs. Thus, salaries are assumed to increase by 15 percent. Contracting is essentially a recurrent cost and it is assumed that the cost will remain constant in real terms after the Project is completed. The cost of administration of the Project, including the Ministry of Health's cost in administering the loan, the cost of consultants, and monitoring and evaluation of the Project are also included as components of the recurrent cost.

Public funds used for investment come at a premium because of the distortionary effects of the taxes needed to collect them. Estimates in the literature indicate losses are on the order of 30 to 50 percent in industrial countries and even greater for developing countries (Hammer 1997). Public investment will not induce distortionary tax effects if the investment is financed through borrowing and the project output is priced to achieve full cost recovery. However, such is not the case with the Project. Although the capital investment is financed through borrowing, project output will be heavily subsidized and full cost recovery is not planned. Therefore, debt servicing will be financed through incremental taxation and this taxation will introduce incremental distortions at some future date. Recurrent costs will also be financed through incremental taxation. The economic cost of the distortionary effects of the taxes is not included in the economic analysis because of the lack of data to quantify it. However, the economic cost is likely not substantial because borrowings to finance the Project are concessional with a grace period of 8 years. Thus, any distortionary effects that may occur are heavily discounted and should not have a significant impact on the economic analysis.

### 3. The Economic Internal Rate of Return

In cases where the economic benefits of a health project may be identified and valued, it is possible to subject the project to a full cost-benefit analysis in which the values of health benefits are compared with project costs. Three criteria are commonly used to aggregate and compare benefits and costs: (i) economic benefit-cost ratio, (ii) economic net present value, and (iii) economic internal rate of return (EIRR). It has been the standard practice for ADB to use the EIRR criterion because not all investment opportunities are evaluated together and compared in terms of economic net present value. Thus, EIRR ensures that at least the project creates net benefits in excess of a discount rate representing the next best alternative project in the economy. An acceptable project will have an EIRR above the critical discount rate of 12 percent in real terms. Box 2 provides a general framework for calculating the EIRR of a health project.

#### **Box 2: Steps for a Benefit-Cost Analysis of a Health Sector Project**

##### **Step 1: Collection and Preparation of Benefit and Cost Data**

- Determine the appropriate price numeraire for the benefit-cost analysis. Normally, the domestic price is used as numeraire if most benefits and costs are nontradables
- Identify and value economic benefits of the project in terms of resource costs savings, productivity gains, and any other quantifiable benefits that are expected to be realized over the life of the project
- Identify and value economic costs. These economic costs are the same economic costs of the preferred project alternative used in the least cost analysis

##### **Step 2: Calculation of the Economic Internal Rate of Return**

- Calculate the net economic benefits for each year
- Calculate the economic internal rate of return from the net economic benefit stream

Table 2 shows the estimated cost and benefit streams for the Project for 20 years, the expected life of the Project. Costs and benefits exclude taxes and duties and are valued in constant 2002 dollar terms. Local currency costs and benefits are converted using the average 2002 exchange rate. Border price is the numeraire because of the limited use of the local currency, especially in the rural areas. The standard conversion factor applied to nontradables is 0.95. The net present value calculation discounts the cost and benefit streams at 12 percent in real terms.

**Table 2: Estimated Costs and Benefits of the Project**  
 (\$ million in 2002 constant prices)

YEAR	ECONOMIC COSTS			ECONOMIC BENEFITS		NET ECONOMIC BENEFITS
	Capital Cost	Contracting Costs	Incremental Recurrent Costs	Incremental Benefits	Cost Savings	
2002	1,572,911	4,076,000	179,341			(5,828,252)
2003	4,036,807	1,493,000	830,210			(6,360,017)
2004	5,891,602	2,089,000	2,015,146	882,000	3,000,000	(6,113,748)
2005	2,640,315	2,049,000	2,748,172	1,764,000	6,000,000	326,513
2006	655,366	1,849,000	2,470,817	2,646,000	9,000,000	6,670,817
2007		2,383,000	2,470,800	3,528,000	12,000,000	10,674,200
2008		2,383,000	2,470,800	3,528,000	12,000,000	10,674,200
2009		2,383,000	2,470,800	3,528,000	12,000,000	10,674,200
2010		2,383,000	2,470,800	3,528,000	12,000,000	10,674,200
2011		2,383,000	2,470,800	3,528,000	12,000,000	10,674,200
2012		2,383,000	2,470,800	3,528,000	12,000,000	10,674,200
2013		2,383,000	2,470,800	3,528,000	12,000,000	10,674,200
2014		2,383,000	2,470,800	3,528,000	12,000,000	10,674,200
2015		2,383,000	2,470,800	3,528,000	12,000,000	10,674,200
2016		2,383,000	2,470,800	3,528,000	12,000,000	10,674,200
2017		2,383,000	2,470,800	3,528,000	12,000,000	10,674,200
2018		2,383,000	2,470,800	3,528,000	12,000,000	10,674,200
2019		2,383,000	2,470,800	3,528,000	12,000,000	10,674,200
2020		2,383,000	2,470,800	3,528,000	12,000,000	10,674,200
2021		2,383,000	2,470,800	3,528,000	12,000,000	10,674,200
<b>Economic Internal Rate of Return = 30.5%</b>						
<b>Net Present Value (at a 12% discount rate) = \$30.6 million</b>						

The major benefits from the Project are in terms of out-of-pocket savings, as health finance improves and more resources are channeled through the formal system. Even with these relatively conservative assumptions, the Project yields a real economic rate of return of 30.5 percent. The rate of return is likely higher as healthier workers are able to work more productively and earn a higher wage.

Table 3 presents the results of the alternative scenarios to test the sensitivity of the Project to less optimistic assumptions. The “Low Participation” scenario assumes that the uptake of the Project is slower than expected. The “Fewer Sick Days Saved” scenario assumes that the Project does not reduce the number of days lost due to sickness. The “Less Cost Savings” scenario assumes that the Project is not as successful in reducing out-of-pocket expenses. Table 1 provides the details of those alternative scenarios.

**Table 3: Sensitivity Analysis**  
 (\$ million in 2002 constant prices)

<b>SCENARIO</b>	<b>ECONOMIC INTERNAL RATE OF RETURN</b>	<b>NET PRESENT VALUE</b>
Base Case	30.5%	\$30.6 million
Low Participation in the Project	20.1%	\$12.0 million
Fewer Sick Days Saved	26.1%	\$22.3 million
Less Cost Savings	13.4%	\$1.9 million

Even with the most pessimistic assumption, the Project has a positive rate of return of about 13 percent. Reducing the number of sick days saved has little effect on the overall rates of return, reflecting the low value of time. Of course, as health and economic conditions improve, the value of time will increase. More important to the overall economic viability of the Project is the cost savings associated with reforming health finance in Cambodia and improving efficiency in the health sector. This underlines the importance of the Project’s commitment to health sector reform and improving delivery to complement the traditional Project focus of providing supply and infrastructure.

The Project is part of the larger health sector reform process, as guided by the Health Sector Strategic Plan, 2002-2007. At this stage, it is not possible to economically assess the Strategic Plan because of the large number of components that have not yet been identified and a number of activities whose impacts are difficult to measure (for example, sectorwide monitoring and evaluation). The World Bank undertook an economic analysis of its component in the health sector and found an overall economic internal rate of return of 29 percent, which is consistent with the Project’s rate of return.

### **C. Preliminary Assessment of the Incidence of Benefits**

A key question regarding the economics of a project, especially one that provides public goods such as some health services, is who benefits from the project. On a general level, this question may be answered by assessing the project’s impact on the health of people in the targeted region and

subsequently estimating the proportion of the project benefits that accrue to the different beneficiary groups. ADB's priorities for health sector projects are the poor, women, and indigenous peoples, according to the *Handbook for the Economic Analysis of Health Sector Projects* (ADB 2000). The degree of detail in the assessment of benefit incidence will normally vary considerably, depending on the amount of resources available for surveying and data compilation and analysis. In cases where a detailed analysis is not possible, simpler indicators may be used, such as the number of people within a target group that are served by the project. This was the approach used in the analysis of the incidence of benefits from the Project. A more detailed analysis of the incidence of benefits was not possible because of the limited amount of data on beneficiaries in the project area.

The approach utilized began with an assessment of poverty in the provinces where the project facilities were to be constructed. Data on the poor and near-poor was obtained from the sources published by the World Food Program. It was assumed that the number of people served by the project facilities varied proportionally with the amount of investment and that the composition of the beneficiaries by income level would be similar to that at the provincial level. Since the project facilities were to serve a significant proportion of the population of each province, this assumption was deemed reasonable. Based on these assumptions and data, the distribution of project benefits was estimated.

It was found that the Project covered more than 5 million people (about 40 percent of the total population of Cambodia). The poor made up 36 percent of the project area population and the near-poor made up about another 40 percent. Thus, about three-quarters of the project area's population was poor or near-poor. The Project was designed to direct a disproportionate amount of the benefits to the poor segment population and it is estimated that these people would capture at least 47 percent of the project benefits. Since health problems are normally considered one of the main causes of poverty, the Project would also reduce the number of people falling into poverty.

It was estimated that about 92 percent of the beneficiaries (4.2 million people) will come from the rural areas. By strengthening safe-motherhood services, improving antenatal care, and providing emergency obstetric facilities, the Project is expected to improve access to quality health service for 2.5 million women, or about half of the women in the project area. The Project is also expected to have a major impact on improving the health status of ethnic minorities in the provinces of Mondol Kiri and Rattanak Kiri, which are among the poorest in the country, through measures that bridge linguistic and cultural gaps.

## **IV. FINANCIAL SUSTAINABILITY OF THE HEALTH SECTOR AND PROJECT**

### **A. Fiscal Sustainability**

The sustainability of the health care system is a serious concern for the government. Cambodia is still in the process of reconstructing its economy and its health care system and, as a result, the amount of resources available for all sectors (including health) is quite limited. Although the health needs of the country are great, any investment in the health system must be sustainable, in the long run, with domestic resources. It is estimated that a basic package of publicly provided services costs between \$12 (*World Development Report 1993*) to \$24 (*Macroeconomics and Health Report 2001*).

Cambodia is unusual among Asian countries with a large share of spending on health, currently accounting for an estimated 12 percent of the GDP. Of this, the largest percentage comes from



household expenditures at 83 percent. The government's contribution to total health care is estimated at be 5 percent and development partners for the remaining 12 percent of the total. The government's effort is severely limited by its narrow revenue base, currently accounting for around 12 percent of GDP.

While the private sector is an important source of health care services in Cambodia, most studies suggest that the country's overreliance on the private sector has serious negative consequences on efficiency because of a lack of supervision and regulation. The private sector relies heavily on the prescription of drugs that are often not appropriate and often of poor quality. In addition to concerns about the efficiency of private health care, there are serious equity issues associated with high private costs and a weak social safety net associated with private health care. Health interventions that have a strong public good component generally require government support.<sup>2</sup>

The health sector is largely dependent on international support and patients for financing. Patients often have limited information about their health care options and the government can play an important role in providing health services that are low-cost and effective. A large proportion of international resources goes to capacity building and capital expenditures which, while important, do not directly contribute to providing basic health care.

The Government of Cambodia currently does not have the resources to sustain the health sector on its own. With a budget between \$2 to \$3 per capita, government spending is well below the recommended targets for health spending. Given Cambodia's low income and small revenue base, the country will have to depend on international assistance for several more years. Nevertheless, Cambodia will have to develop an "exit strategy" to ensure that the health sector will function when international support eventually is reduced. It will also have to develop a strategy to better target private health care spending.

The Government of Cambodia allows user fees to be charged, the level of which are officially governed by the health financing charter. The charter establishes national fees for services and authorizes that 99 percent of the revenues generated from the fees remain with the health service provider (health center or hospital) to provide incentives to health workers to improve the quality of services. The remaining one percent is transferred to the provincial government. In practice, user fees are normally charged, but many health workers also collect unauthorized fees to supplement their relatively small official salaries. In districts where nongovernmental organizations are contracted to manage health services, local health care providers have more flexibility and autonomy in the collection of user fees. In some cases, for example, tuberculosis treatment, there is no fee charged because the government subsidizes the entire cost.

Currently, primary health care is funded by the government budget, user fees, and donors. Figure 1 estimates the total contribution from all three sources based on a number assumptions about the size and direction of these financing sources. The assumptions are as follows.

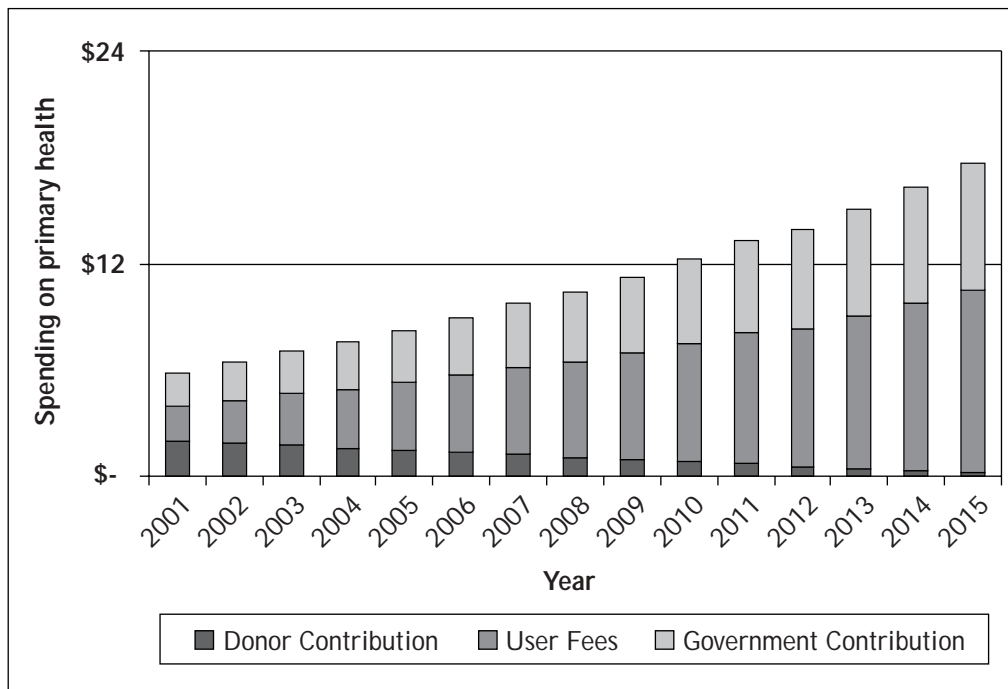
- (i) The economy will grow at a moderate rate of 5.5 percent and the population will grow at the current rate of about 1.7 percent. The projected economic growth rate is below the current trend but is consistent with the long-term growth rate of the country.
- (ii) The proportion of the economy accounted for by government expenditure will grow moderately to about 18.7 percent of GDP in 2015. The health sector will

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<sup>2</sup> This includes both pure public goods (for example, vector control and disease monitoring) and goods with high public externalities (for example, vaccination coverage and control of tuberculosis).

- account for 10 percent of total government spending. Some of this expenditure will be for administrative costs and for higher-level services.
- (iii) Donor financing will drop off sharply over the period 2001 to 2015. Given that donors primarily finance capital spending and capacity building, only part of donor financing will support basic primary health care.
  - (iv) Currently, household spending for health is relatively inefficient because of a lack of information and alternatives. Over time, households will learn to better allocate their resources for basic primary health care.

**Figure 1: Estimated Spending on Basic Primary Health Care**



On the basis of these assumptions, Cambodia should be able to meet the basic primary health care target of \$12 per capita by 2010, relying almost entirely on domestic resources. These assumptions are conservative and the country may be able to reach this target earlier. Cambodia already spends substantially more than \$12 per capita on health care, largely through household financing of low-quality private services. Were this spending better utilized, Cambodia would already be above international guidelines for basic health care. With the long-term increase in education and with improvements in the health care system, it is possible that household spending will have a more positive impact on health.

## B. Project Sustainability

One of the goals of the Project is to increase the efficiency of health care spending while at the same time increasing the affordability of health care. By focusing on health system management and development, the Project generates user fees more efficiently, contributing to the sustainability of the Project by providing additional resources to finance recurrent and other costs. Consumers currently spend enough to ensure that the health system has sufficient resources to provide basic health services for all. Improving the efficiency of consumer health care spending will also increase the sustainability of the health sector and contribute to Cambodia's long-term development.

The financial impact of the Project on government's health spending will be felt in several areas. Contracting of health services requires at some point that the government either take over the contract (putting the contract on its own budget) or replace the contract service with its own publicly organized services. The construction of new civil works and the provision of equipment will require additional spending on maintenance. While these costs are modest, they will require a commitment on the part of the government to ensure that the benefits of the investment are not lost.

The Project is part of a larger health sector reform program with the World Bank and DFID also providing funding for specific components. The ADB/DFID component of the Project will introduce about \$4.2 million per year in incremental recurrent costs. On the basis that this amount is 1/3 of the total incremental recurrent costs, the total additional resources needed for financing recurrent costs in 2008 will be \$12.6 million per year. The overall budgetary allocation to the health sector in Figure 1 shows that the government should expect an increase of its health sector budget from \$43 million in 2003 to \$68 million in 2008. This increase of \$25 million will be more than sufficient to cover completely the additional costs introduced by the Project. Although future ADB assistance is likely necessary for the health sector, following current trends Cambodia is in a good position to ensure the sustainability of the Project.

## IV. CONCLUSIONS

This technical note demonstrates how an economic analysis of a health project may be undertaken. The analysis began with establishing a sound rationale for the proposed project, then confirmed the cost effectiveness of the approach taken to achieve the objectives of the project. Cost effectiveness was based on a least cost analysis in which all feasible alternatives were examined. The least cost alternative was further examined in terms of the returns it was expected to generate with respect to the economic resources invested. This step involved the identification and valuation of economic benefits that the proposed project is expected to create. Economic benefits are usually resource cost savings and productivity gains, but there may be other positive externalities that could be valued and included in the analysis as well. The estimated EIRR was estimated in excess of 30 percent.

The economic benefits that health projects are expected to generate will be realized only if the project is sustainable over its lifetime. The key issues regarding sustainability are the institutional and financial capacity of the government to ensure that staff has the skills and training to operate, maintain, and administer the Project, and that financial resources are available to fund the recurrent costs that will be incurred in the future. The project design is a key factor that will prevent institutional shortcomings from impeding the operation of the project facilities. The contracting of services to

nongovernmental organizations ensures that the day-to-day operations of the health care facilities are efficient and the Project provides for the strengthening of institutional capacity in management, planning, and evaluation at the national, provincial, and district levels so that the Project is properly managed and supervised.

The financial sustainability of the Project was also assessed on a fiscal and project level. An analysis of recent budgets and projected government expenditure concluded that there was a capacity and willingness in the government to allocate budgetary resources to the health sector and the proposed project. User fees will also supplement the financing of recurrent costs incurred by the project facilities and may eventually become a major source of independent finance.

The economic analysis of the Project relied largely on readily available data and surveys and could be replicated in a wide range of health projects. Poverty estimates were based on poverty maps that are being developed for a large number of countries. The estimated project impact was based on a household survey. Although the survey was specifically designed for the health sector, data from any standard household survey could be used to make similar estimates on the likely impact of health interventions.

This technical note demonstrates that the approach to an economic analysis of a health project does not differ greatly from an economic analysis of projects in other sectors. The approach, the data requirements, and the complexities of the analysis are similar. An economic analysis should therefore be a standard requirement in the documentation and justification of a health project proposal.

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