

period was then used as the initial benchmark to move to the standard incentive scheme.

Medical specialists did not receive salaries from PROSALUD, but worked on a fee-sharing basis. Pediatricians and gynecologists received half of the fees they generated, while dentists, who were responsible for providing their own materials and equipment, received 80 percent of the fees they generated.

Pharmaceutical Products

PROSALUD carried 134 essential drugs that were procured up to four times a year from twenty suppliers in Bolivia. In 1987 PROSALUD realized that pharmacy services represented more than 28 percent of revenues generated, but the costs of delivering these services were greater. PROSALUD's pricing policy for pharmaceuticals was a mark-up of 15 to 25 percent over wholesale cost. Private sector establishments charged a 50 percent mark-up. PROSALUD reduced its average medication cost per consultation at each clinic between 1987 and 1988. Pharmacies became net revenue generators and accounted for nearly 35 percent of total system revenues. Poly-prescribing practices still existed in some clinics (see Exhibit 9).

Services

PROSALUD provided a range of preventive and curative services (see Exhibit 10). These services were used to categorize indicators for each center that allowed PROSALUD to monitor and evaluate performance.

Dentistry had recently been added at the request of the communities. Family planning services, normally subject to political and religious resistance in Bolivia, were also added at some risk to PROSALUD's image within Santa Cruz. The evaluation report called for the expansion of family planning activities, as well as further efforts in nutrition education and the introduction of a breastfeeding promotion program.

Most preventive services were provided free of charge, and approximately 8 percent of patients were provided with free care for all services. Exhibit 10 shows trends in the level and mix of services provided by PROSALUD.

Financing

The initial source of funding for PROSALUD was the USAID grant provided under the terms of Bolivia Self-Financing Primary Health Care Project. Over time, grant support was reduced in line with the system's ability to cover some of its own costs through revenue generation. In late 1989, 20 percent of the MSU's costs were allocated to the clinics, prorated on the basis of the total costs of each clinic. Other MSU costs, including marketing, training, and clinic deficits were covered by the USAID grant, additional smaller grants, and the

資料 I-3. ケース教材

income-generating consulting and research activities of PROSALUD staff. In general, the MSU had been able to maintain its costs at close to the 1988 level (see Exhibit 6).

The buildings in which PROSALUD clinics were based and the operating costs of the buildings were contributed by the communities or other organizations (see Exhibit 2).

We say our clinics, but they're not PROSALUD's. They belong to the communities. Community ownership is important. People will take pride in their responsibility for the destiny of the clinics.

In the Cotoca facility, the MPSSP continued to pay salaries, which PROSALUD supplemented. A major turnaround in net revenue generation at Cotoca occurred in general medical consultations when the physician incentive plan was introduced and the nurse and doorman were terminated. The MPSSP also subsidized salaries at Los Tajibos, Montero Hoyos, and Puerto Pailas. None of the peri-urban clinics received any subsidies.

The Alcaldía had expressed interest in turning over seven of its remaining clinics to PROSALUD management. Both the MPSSP and the Caja Nacional, the largest subprogram of social security, had also expressed interest in further cooperative arrangements with PROSALUD.

In 1986 PROSALUD offered both a prepaid and fee-for-service plan in the one urban and five rural clinics then in existence. For the prepaid plan, individual participants paid the equivalent of US\$20 per year for an unrestricted number of visits.¹ Utilization rates were much higher for prepaid plan members than for fee-for-service users, and this plan had to be phased out because of financial losses. In mid-1988 PROSALUD began an experiment with a deferred payment program intended to serve approximately 1,300 employees of twenty-six business enterprises. The plan offered the businesses a single source of care as an alternative to the obligatory social security system. However, payments from the businesses were not collected easily or quickly, and the resultant cash flow crisis caused PROSALUD to abandon the program a year later. The free provision of medicines was generally regarded as a critical factor in the failure of both the prepayment and deferred payment programs.

In 1989, the cost accounting system included nine cost/revenue centers: (1) the pharmacy; (2) medical consultations; (3) nursing services; (4) laboratory examinations; (5) births and deliveries; (6) community organization and training; (7) dental services; (8) changes in medicines, office supplies, and lab supplies, and (9) changes in office furniture and equipment, medical and lab equipment, vehicles, and any improvements in physical plants.

1. One U.S. dollar was equivalent to Bs 2.86.

PROSALUD's financial systems had evolved over time. Cost accounting categories had been eliminated or redefined to conform with shifting operating realities. Because past categories might overlap, partially duplicate, or simply not exist when compared with more recent categories, this made it difficult to compare trends over time.

Many cost categories could not be matched exactly with the costs related to services that also generated revenues. Costs that at least partially supported other revenue-generating activities were not allocated to the services they supported. Nursing services were one example. Although nurses provided reception and triage for all activities, including assistance in the labs, their costs were collected and compared with revenues generated by nursing services. As most direct nursing services were preventive care (immunization, etc.), this cost center showed the largest deficit. Other cost centers, such as dentistry, were viewed as net revenue generators, but had no system support costs allocated to them. Pharmacy costs only included costs directly associated with the pharmaceuticals.

Information generated by these financial systems indicated that five services were net positive revenue generators (see Exhibit 11). Births and deliveries were estimated to generate from two-and-a-half to three-and-a-half times their costs in revenues.

Promoting PROSALUD

PROSALUD had used various promotional techniques to increase demand for services. Since clients valued the services of physicians, deliveries now were performed by physicians rather than midwives. The number of drugs available was increased and their presentation made more attractive. Preferential prices for drugs were used for clients served by PROSALUD physicians and nurses. Radio spots and brochures were developed, and a video was tested on PROSALUD staff, but not used for promotion. Another approach to promotion was the health fair that was conducted at some clinics. It combined health education in the form of posters, measured children's heights and weights, and used educational entertainment such as cooking competitions between mother's clubs. The short-run increase in patient volume was impressive and paid for the costs of the health fair, but it was short-lived and the fairs were generally not repeated. Each of the centers also designated its largest room as the space for other organized neighborhood activities, and these rooms were decorated with plants and paintings. PROSALUD believed that generally word-of-mouth advertising was its best promotional vehicle.

Medical Community Perspective

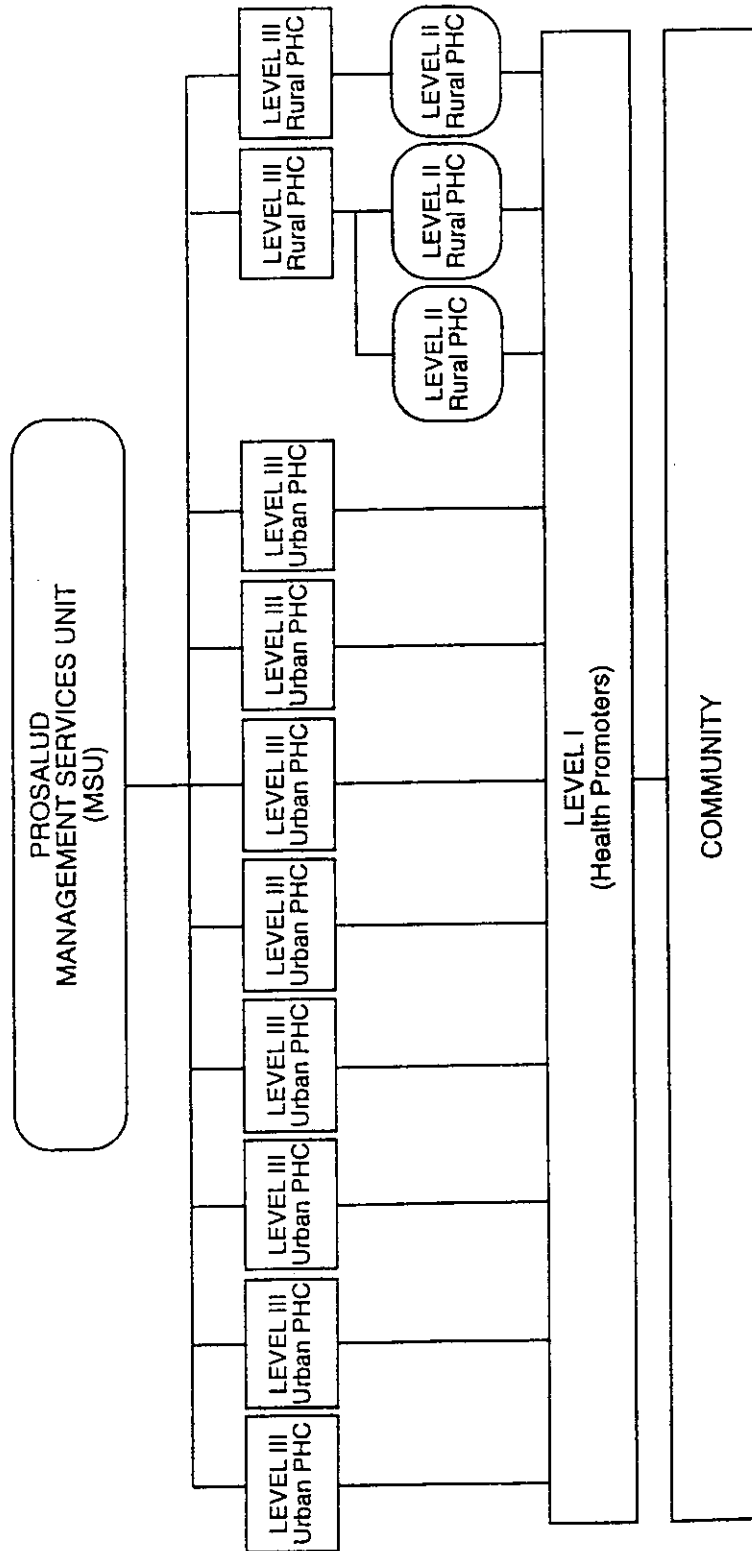
The College of Medicine's register indicated that nearly 1,200 physicians lived and/or practiced in Santa Cruz. Of these, the president of the college estimated that half were unemployed. Approximately 400 worked in permanent positions with the MPSSP or social security. Only 50 percent worked full time,

and the remaining 200 worked half or three-quarters-time. There had been no discernible change in the prices charged by private physicians. The college, which acted as a trade association, published a fee schedule to which the president believed private physicians generally adhered. Various pressures were brought to bear on those who did not, and the president made it clear that he felt the lower prices of the PROSALUD system (see Exhibit 12) exacerbated the unemployment problem for physicians, undermined physician solidarity, and created economic insecurity for individual physicians by making it difficult for them to earn what the college felt were appropriate salaries. Private solo practices and polyclinics in the areas immediately surrounding PROSALUD facilities were reported to be charging prices far below the minimum schedule recommended by the college.

The MPSSP, the social security, the Alcaldía, and other organizations' view of PROSALUD was generally very supportive. PROSALUD had maintained close cooperative relationships with other institutions, including completing the reporting forms normally required in the MPSSP system. PROSALUD was generally seen as a vehicle to assist the MPSSP in providing health services. PROSALUD prices were almost identical to those of the MPSSP.

Carlos considered what expansion efforts PROSALUD might want to undertake in the Santa Cruz area and whether replication was possible in other areas of Bolivia. He had little information available that would allow him to compare the health sector situation in Santa Cruz to other parts of Bolivia and to assess whether the PROSALUD system could succeed. Was it in fact replicable? While he felt that PROSALUD should explore possible options for expansion, he also was concerned about how to improve the system already in place as well as how to assure the long-term viability of PROSALUD.

EXHIBIT 1
ORGANIZATIONAL STRUCTURE OF THE PROSALUD SYSTEM



Source: PROSALUD.

EXHIBIT 2
PROGRESS OF CLINICS TOWARD SELF FINANCING, 1988-September 1989

Health centers	Date of establishment	1988				1989 ^a				Facility support ^b
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
URBAN										
Villa Pillin	3/86	82	63	74	90	94	100	108		Community & USAID
El Carmen	7/87	90	89	125	137	134	130	138		La Alcaldia Municipal
La Morla	10/87	95	82	99	87	97	95	104		La Alcaldia Municipal
La Madre	5/88		77	83	99	108	103	95		La Alcaldia Municipal
Los Lotes	11/88				39	53	52	66		Fondo Social de Emergencia
Fioanini	7/89							40		Fondo Social de Emergencia
La Cuchilla	7/89							53		Fondo Social de Emergencia
Las Pampitas	7/89							57		Fondo Social de Emergencia
Ismael Suarez										
Heroes del Chaco										
Urban average		89	78	97	99	104	102	88		
RURAL										
El Pailon	3/86	60	41	48	54	47	55	53		Community
Montero Hoyos	6/86	50	53	40	42	59	64	47		Community
Coloca	6/86	57	56	54	57	86	97	101		MPSSP
Los Tajibos	10/86	30	36	43	48	73	67	92		Community
Puerto Pailas	10/86	89	82	91	79	77	79	84		CORDECRUZ
Rural average		61	53	56	58	68	76	78		
Overall average		85	81	91	92	95	96	87		

Q: Quarter

Note: The cost of the MSU are excluded

a. Averages are weighted by clinic size. Quarter 3, 1989, weighted urban clinic average excluding the three clinics opened that quarter was 107 percent. The overall weighted average was 101 percent.

b. Facility Support refers to the ownership or construction of the building. LaAlcaldia Municipal is the Santa Cruz municipal government. Fondo Social de Emergencia is one of the numerous government mutual aid funds. CORDECRUZ is the Regional Cooperation.

Source: PROSALUD.

EXHIBIT 3
TRENDS IN BOLIVIAN
PUBLIC HEALTH SECTOR FINANCING, 1984-88

Source	1984	1985	1986	1987	1988
National treasury and others	92.2	62.2	48.8	60.2	50.1
User fee	5.6	17.2	30.1	25.4	22.1
External aid	2.2	20.6	21.1	14.4	27.8
Total	100	100	100	100	100

Source: MPSSP data; World Bank (1989).

EXHIBIT 4
SOCIOECONOMIC INDICATORS

Indicator	Level
Total population, 1988 (millions)	6.9
Population residing in urban areas, 1988 (percent)	50
GNP per capita, 1988 (US\$)	570
Average growth of GNP, 1965-88 (percent)	-0.6
Average growth in GDP, 1980-88 (percent)	-1.6
Average annual inflation, 1980-88 (percent)	483
Unemployment rate, 1980 (percent)	5.8
Unemployment rate, 1986 (percent)	20
Population with income insufficient to satisfy 70% of basic needs, 1975 (percent)	80
Share of central government health expenditures, 1972 (percent)	6.3
Share of central government health expenditures, 1988 (percent)	1.9
Life expectancy, 1988 (years)	53
Infant mortality rate, 1988 (per 1,000 live births)	108
Adult illiteracy rate, 1985 (percent)	26

Source: World Bank (1990).

資料 I-3. ケース教材

202 Section Two: Applied Experiences in Health Economics and Financing

EXHIBIT 5
SOURCES AND USES OF MPSSP HEALTH
EXPENDITURES IN SANTA CRUZ, 1987

Funding source	Expenditures			
	Personnel	Operations	Investment	Total
National treasury (US\$)	2,522,182	354,405	0	2,876,590
Percentage of source	88	12	0	100
Percentage of total	55	13	0	31
User fees (US\$)	2,052,736	2,202,596	233,876	4,489,208
Percentage of source	46	49	5	100
Percentage of total	45	84	11	48
Subtotal	457,492	2,557,001	233,876	7,365,798
	62	35	3	100
	100	97	11	79
DONATIONS				
Municipal (US\$)	0	29,028	551,426	580,454
Percentage of source	0	5	95	100
Percentage of total	0	1	27	6
Regional (US\$)	0	11,000	466,624	477,624
Percentage of source	0	2	98	100
Percentage of total	0	0	22	5
International (US\$)	0	31,177	823,463	854,640
Percentage of source	0	4	96	100
Percentage of total	0	1	40	9
Subtotal	0	71,205	1,841,513	1,912,718
	0	4	96	100
	0	3	89	21
Total	4,574,921	2,628,206	2,075,389	9,278,516
	49	28	22	100
	100	100	100	100

Source: MPSSP data; World Bank (1989).

EXHIBIT 6
COMPARISON OF MSU COSTS
FIRST QUARTERS OF 1987 AND 1988

Costs	March 1987 Bs		Percentage change
	1987	1988	
VARIABLE COSTS*			
Office supplies	1,218	676	-44.5
Communications	696	123	-82.3
Fuel and maintenance	836	698	-16.5
Transportation and travel	1,066	326	-69.4
Training	594	313	-47.3
Utilities	190	181	-4.7
Other	1,944	923	-52.5
Subtotal	6,544	3,240	-50.5
FIXED COSTS*			
Personnel	24,100	16,151	-33
Rent	1,800	1,303	-27.6
Vehicle depreciation	632	1,986	214.2
Subtotal	26,532	19,440	-26.7
Total	33,076	22,680	-31.4

a. Variable and fixed cost categories were established by the study team during the development of the market analysis model.

Source: PROSALUD

EXHIBIT 7
PROSALUD MARKET SURVEY DATA RESULTS

Center	Number of families	Total population	Average family size	Less than 2 years in area	Less than 2 years in Santa Cruz	Mother's education			Own home	Health insurance
						Formal employment	None	Basic		
URBAN										
Petrolero	1,299	6,427	4.9	65	79	22	14	46	63	28
Pampitas	1,383	7,066	5.1	49	50	14	20	41	72	8
Chichilla	1,822	8,796	4.8	56	58	12	5	44	62	7
Foianini	1,764	9,623	5.5	65	62	38	4	40	63	19
Heroes	1,726	9,447	5.5	56	66	26	14	40	69	21
Lotes	1,478	7,265	4.9	49		11			73	11
Madre	1,665	6,565	3.9	53		20			40	16
Morita	1,798	7,832	4.4	55		23			44	22
Carmen	2,608	15,885	6.1	68		21			51	21
Villi Pillin	1,402	8,065	5.8	66		23			74	20
<i>Subtotal</i>		86,971								
RURAL										
Cotoca	442	2,479	5.6	86			13			28
Tajibos		800							77	15
Pto. Pailas	162	909	5.6							5
Pailon	353	1,861	5.3	93						
Monetero	147	750	5.1	94						
<i>Subtotal</i>		6,799								

Note: For blank cells information was not available.
Source: PROSALUD.

EXHIBIT 8
PERSONNEL COSTS AS A PROPORTION
OF CLINIC COSTS, 1988

Health centers	Costs of personnel (1988US\$)	Percentage of operating costs ^a	Percentage of total costs ^b
URBAN			
Villa Pillin	23,613	68.5	53.7
El Carmen	18,313	69.5	53.3
La Morita	17,320	63.7	52.2
La Madra	9,740	67.5	65.4
RURAL			
El Pailon	10,353	64.1	61.1
Montero Hoyos	2,010	68.1	64.1
Cotoca	1,971	64.0	61.2
Los Tajibos	3,163	39.3	37.4
Puerto Pailas	9,213	61.1	56.6
Overall average		64.8	54.9

Note: MSU costs are included in calculations for both operating and total costs because most MSU costs are personnel costs and disaggregation was not possible. MSU personnel totalled twenty-four persons in 1986, but were reduced to only nineteen persons by late 1988.

a. Operating costs include medicines, medical and laboratory supplies, office supplies, personnel and transportation.

b. Total costs include operating costs, plus marketing costs and depreciation.

Source: PROSALUD.

EXHIBIT 9
MEDICATION DISPENSED BY PROSALUD CLINICS, 1988

	1988 US\$					Percentage of PROSALUD's income
	Number of visits	Cost of drugs	Cost per visit	Revenue from drug sales	Drug sales surplus	
URBAN						
Villa Pillin	4,932	4,826	0.98	6,660	2,834	25.1
El Carmen	8,322	6,547	0.79	10,341	3,794	25.2
La Morita	6,750	8,095	1.2	10,377	2,282	33.1
La Madre	4,855	1,601	0.33	3,229	1,628	25.4
Subtotal	24,859	21,069	0.85	30,607	9,538	27.4
RURAL						
El Pailon	987	3,612	3.66	4,947	1,335	59.9
Montero	679	819	1.21	1,152	333	65.1
Hoyos						
Cotoca	2,048	4,552	2.22	5,783	1,231	48.8
Los Tajibos	315	642	2.04	972	330	63.2
Puerto Pailas	1,071	3,433	3.21	5,296	1,863	77.9
Subtotal	5,100	13,058	2.56	18,150	5,092	60.1
Total	29,959	34,127	1.14	48,757	14,630	34.4

Source: PROSALUD.

EXHIBIT 10
TRENDS IN LEVEL AND MIX OF SERVICES, 1987-SEPTEMBER 1989
 (average number of visits for all active clinics)

Service	1987				1988				1989			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	
PREVENTIVE												
Prenatal	51	49	63	84	98	68	84	78	82	100	115	
Births	12	10	14	15	22	18	21	23	30	37	36	
Perinatal	11	6	10	12	22	19	30	21	30	37	59	
Well-child	107	90	89	95	86	78	86	85	67	104	137	
Vaccinations ^a	161	813	291	341	229	296	533	290	288	381	844	
House calls	90	115	37	34	42	40	50	34	40	52	64	
Subtotal	432	1,083	504	581	499	519	794	531	537	711	1,255	
CURATIVE												
General consultation	557	427	638	784	813	540	864	822	777	854	848	
Diarrhoeal	42	37	37	72	39	26	38	60	43	33	46	
Acute respiratory	46	66	69	63	58	47	105	86	100	88	107	
TB treatments	13	9	7	5	6	1	16	4	5	5	4	
Subtotal	658	539	751	924	916	614	1,023	972	925	880	1,005	
Total	1,090	1,622	1,255	1,505	1,415	1,133	1,817	1,503	1,462	1,591	2,260	

Q. Quarter
 a. DPT, BCG, tetanus, toxoid, polio, and Measles.
 Source: PROSALUD.

EXHIBIT 11
KEY NET REVENUE GENERATING SERVICES
 January - June 1988

Service	January	February	March	April	May	June
Pharmacy (US\$)	1,529	1,420	2,349	1,606	1,506	1,818
Laboratory tests (US\$)	2,849	1,688	2,105	1,962	1,097	5,007
Subtotal (US\$)	4,378	3,108	4,454	3,568	2,603	6,825
Percentage	47	42	42	38	32	50
Dentistry (US\$)	851	729	937	1,182	1,093	982
Births and deliveries (US\$)	1,224	1,062	2,282	1,356	2,399	3,163
Pediatrics (US\$)	2,855	2,426	2,859	3,228	1,997	2,644
Subtotal (US\$)	4,930	4,217	6,078	5,766	5,489	6,789
Percentage	53	58	58	62	68	50
Total	9,308	7,325	10,532	9,334	8,092	13,614

Source: PROSALUD.

EXHIBIT 12
CHARGES FOR SELECTIVE MEDICAL PROCEDURES,
PRIVATE MEDICAL MARKET STANDARD AND PROSALUD
 (Bs)

Procedure	PROSALUD price		Minimum price recommended by the College of Medicine ^a
	Rural clinic	Urban clinic	
Consultation			
General or family practitioner	5	5.0-6.0	15
Specialist	N/A	7.5-8.0	22.5
Birth and delivery ^b	50-60	110	450
Sutures			
Up to 4 points	8	8	45
Up to 10 cm.			
Additional points	2	2	
More than 10 cm.			75

N/A: Not applicable

a. These are the minimum prices suggested by the college, which suggests that six additional considerations should justify an increase in these prices by as much as threefold.

b. Birth and delivery charges in PROSALUD clinics cover attendance by a gynecologist, two to three inpatient days, medicines, a nightgown for the baby, and one pediatrician visit.

Source: Colegio Medico (1989).

Source Documents

Colegio Medico. 1989. Memorandum on Price Lists Santa Cruz, Bolivia. Unpublished.

World Bank. 1989. "Integrated Health Development Project—Bolivia." Staff Appraisal Report 8001. Washington, D.C.

_____. 1990. *World Development Report 1990*. Washington, D.C.

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Measuring Burden of Disease and Priority Setting

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Department of Hygiene and Public Health
Teikyo University School of Medicine

Schedule:

Session 1: Introduction to Cost-Effectiveness Analysis

Session 2: Cost Analysis

Session 3: Cost-Effectiveness of Health Interventions

Readings:

1. Eddy M. Principles for making difficult decision in difficult times. *JAMA* 1994;271:1792-8.
2. Eddy M. Health system reform. Will controlling costs require rationing services? *JAMA* 1994;272:324-8.
3. Weinstein MC, Stason WB. Foundations of cost-effectiveness analysis for health and medical practices. *New England Journal of Medicine* 1977;296(13): 716-21.
4. Eddy M. Cost-effectiveness analysis. A conversation with my father. *JAMA* 1992;267:1669-75
5. Bobadilla JL, Cowley P, Musgrove P, Saxenian H. Design, content and financing of an essential national package of health services. *Bulletin of the World Health Organization* 1994;72:653-62.

Appendix:

1. Economic indicators in Malawi and the United States from *World Table 1995* (World Bank).
2. GNP per capita 1999 (<http://www.worldbank.org/data/databytopic/GNPPC.pdf>).

Session 1

Introduction to Cost-Effectiveness Analysis

A. Resources for health are limited.

As national income per capita rises, health expenditure per capita rises at a faster rate so that rich states devote a larger share of national income to health.

Demands for health care are greater than available resources, particularly in low income countries where the burden of disease is high and income is low. Need for a health sector reform.

Scarcity of resources implies that everyone cannot afford every possible health intervention. Interventions must be chosen. Difficult decisions in difficult times.

B. Should resource allocation in the health sector be left to the market?

1. Markets for health care.

If markets for healthcare were perfect —*i.e.*, if consumers were perfectly informed about the price and quality of health interventions, the benefits of an intervention accrued only to the individual, and there were no public goods —the market would be an excellent mechanism to choose the best health programs and encourage optimally efficient delivery of these programs.

2. Allocative and technical efficiency.

Throughout this course, we will use two terms related to the performance of health systems: allocative and technical efficiency.

Allocative efficiency refers to the optimal distribution of resources among different programs or interventions in order to achieve some desired objective such as health improvement or consumer satisfaction.

Technical efficiency refers to the optimal use of resources in the delivery or production of a single health intervention.

3. Markets for health care do not always work well.

The problems of leaving healthcare delivery to the market include:

- (a) Some products of the health sector are **public goods**, goods that are not used up by consumers that enjoy them such as parks — *e.g.* environmental modification such as sewerage systems, health education campaigns and alcohol control programs.
- (b) **Externalities** are present. Externalities are where the effects of a good or service are not wholly felt by the consumer—*e.g.*, communicable diseases control.
- (c) **New market failures** exist. In addition to the classical market failures due to externalities and public goods, markets will fail to work when information is difficult to acquire or unevenly distributed —*e.g.*, consumers' inability to acquire complete information about health

interventions without enormous investment of time and money, the asymmetric distribution of information about health interventions between consumers and health care providers, and the high costs to the consumer of making the wrong choice about a health intervention.

(d) Even if the healthcare market were efficient, it may be inequitable. Many societies are more concerned about equity of access to healthcare than equity of incomes.

C. How are resources allocated now?

In nearly every country of the world including Japan, there are significant government or para-statal agencies that fund and/or provide large amounts of healthcare. How are these public moneys allocated among and within programs or health interventions?

1. Inertia.

Most governments will fund in one budget year those items that they funded the previous year with only marginal changes.

2. Past investments.

Past capital investments by governments or by donor agencies carry substantial recurrent budget commitments that are often hard for governments to ignore.

3. Donor agendas.

International trends in public health policy may have a profound impact on budget allocations, especially in smaller developing countries that do not have large capacities for health planning.

4. Political voice.

Significant bias toward urban areas exists in health resource allocation. Curative services are emphasized over preventive services: e.g., Christopher Leave on quadriplegia, etc.

Special constituencies—e.g., the civil service, industrial workers, the military—have great influence in resource allocation.

5. The maximization of health outcomes.

Alternatively, resources could be allocated to maximize health outcomes. Focus of this session is on how quantitative assessments of the costs and benefits of health interventions can be used to assist in allocating scarce resources for health interventions.

No government is likely to allocate healthcare resources exclusively on the basis of cost-effectiveness, however, cost-effectiveness analysis of some health interventions have been influential in changing resource allocation -- e.g. tuberculosis control in China.

D. Tools for the quantitative analysis of health interventions.

Three tools are in wide use to evaluate quantitatively different health interventions: decision analysis, cost-effectiveness analysis and cost-benefit analysis.

Decision analysis is extensively used in North America for aiding in the choice of two or more clinical options for the management of a given condition -- e.g. cholesterol lowering drugs for hypercholesterolemia.

Cost-effectiveness analysis compares costs of an intervention with the outcome of an intervention in units of health change or some more proximate process indicator such as children fully immunized.

In cost-benefit analysis, both costs and benefits of an intervention are denominated in dollars.

Method	Units of Cost	Units of Benefit
Decision Analysis	-	Health
Cost-effectiveness Analysis	\$	Process or Health**
Cost-Benefit Analysis	\$	\$

** 1. Changes in disease incidence, duration, or severity. 2. Changes in mortality.

E. The spectrum of analysis.

Analyses can concern different levels of resource allocation:

- a) Comparing different strategies for one particular health problem.
- b) Comparing various health interventions for different health problems.
- c) Comparing interventions or programs in the health sector with other sectors.

Decision-makers may want to use quantitative analysis to answer different types of questions depending on the constraints they face:

- a) How to allocate a fixed budget to get the greatest improvement in health;
- b) How to allocate a budget increase to get the greatest improvement in health;

F. Attention to cost-effectiveness analysis in the health sector is increasing.

The Oregon Health Services Commission (Oregon State, USA) generated cost-effectiveness figures for 714 interventions and used that data to direct its health resources.

The World Bank through the *Health Sector Priorities Review* and the *World Development Report 1993* has focused attention on the use of cost-effectiveness in resource allocation in developing countries. A large number of countries are now implementing essential packages of cost-effective care.