
ECONOMIC ANALYSIS FOR HEALTH PROJECTS

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This paper applies to the health sector a method of project analysis advocated recently by Devarajan, Squire, and Suthiwart-Narueput. A health project evaluation should establish a firm justification for public involvement; establish the counterfactual—what would happen with and without the project; and determine the fiscal effect of the project and the appropriate levels of fees in conjunction with project evaluation. The evaluation should also acknowledge the fungibility of project resources and examine the incentives both for high-level public servants to shift government resources away from project-funded activities to those that have not been evaluated and for lower-level contractors and civil servants to provide good or bad service. Market failures in health services and insurance markets should serve as a starting point for economic analysis, not as a reason to ignore economics in health projects. Project outputs should be predicted after taking into account the reaction of consumers and providers in the private sector as well as market structures of supply, demand, and equilibrium for health services.

In a recent article summarized elsewhere in this volume, Devarajan, Squire, and Suthiwart-Narueput (1996) discuss factors that should be considered to improve the economic analyses of projects. They suggest that project analysis and its supporting sector work should (1) establish a firm rationale for public involvement; (2) determine the counterfactual—what would happen with and without the project, taking into account the reactions of consumers and other suppliers; (3) identify the fiscal impact of the project on public funds; and (4) consider the possibility that loaned funds are fungible and that the real effect of a loan may derive not from the project identified, but from another project, chosen by the government and made possible by the additional funds. This paper examines these recommendations with respect to project evaluation in the health sector.

The Rationale for Public-Sector Involvement in Health

The policy environment for projects today differs considerably from that of the late 1960s, when the basic ideas of contemporary project evaluation were formulated. At that time, economies in the developing world were highly distorted as a result of protectionist policies and government regulation or direct control of industry. It was assumed that governments would take a leading role in industrial projects, and the literature on project evaluation emerged as a way to help governments make socially profitable investment decisions. The question whether or not these activities should be in public hands was not an issue.

The world has changed significantly in the past thirty years. Countries have liberalized their economic policies and become more market oriented. The absolute level of distortions caused by taxes, trade barriers, and regulations has fallen, and many countries, including those that previously had centrally planned economies, have developed active and competitive private sectors. The premise that governments should carry out or rule on all investment projects is no longer accepted as given.

The techniques of project evaluation should adapt to this changed environment. Government investment, like any government intervention, should be justified in terms of the social benefit the project will have over and above that which would occur without public-sector involvement. For any investment opportunity, the focus of analysis should be on the *difference* between social and private benefits—not on the costs and expected returns to private goods themselves. The standard way to assess this relative benefit is to identify the market failures that characterize the private-sector equilibrium and to quantify the welfare loss from those failures. Priorities for investments should be based on the degree to which investments ameliorate welfare losses. Let me explain.

Policy formation in modern welfare economics usually begins by explaining how private markets allocate resources. In an ideal private market goods will be offered for sale to the extent that prices cover the cost to the seller of the last item sold. They will be purchased to the extent that their value to the buyer is at least as great as their price (and, hence, their cost). When prices, quantities supplied, and quantities demanded are mutually consistent, the market is said to be in equilibrium. In the ideal market the subjective value to the buyer (private) is the same as the value to society (social), and in equilibrium both are equal to the cost to society of producing the commodity, thus ensuring that resources are allocated to their most efficient uses.

Several circumstances interfere with the ability of private markets to operate with such efficiency, causing so-called market failures. These failures may occur, for example, if some goods and services are public goods, which cannot be withheld from persons who do not pay for them and which can be consumed by one person without reducing their availability to other consumers. The social value (total value) of such goods exceeds the private value of production, which is zero, because they will not be sold.

Related to public goods are goods that produce “externalities,” benefits or costs to persons not party to the transaction and not considered by the producer or consumer when deciding how much of the item to sell or buy. The classic example of a negative externality is pollution, whereby a chemical factory does not figure into its costs the damage done by environmental dumping. It will therefore produce too much of its product, reducing the social value of the goods relative to their private value.

Monopolies by one or a few firms may also affect market equilibrium by permitting those firms to raise prices above marginal costs (the unit cost of additional production) and to restrict output, thus driving social costs above social values. Faulty information about the value or cost of products also affects equilibrium.

Associated with each of these market failures is a deviation of social and private value (or social value and social costs) and an associated social welfare loss that is, in principle, quantifiable in money terms.

If a “health project” is any investment in which the improvement of people’s health is an important output, health projects comprise a very mixed assortment of activities. Some of these activities fall under the traditional jurisdiction of ministries of health; others, such as sanitation and safe water, may be directed by other ministries. They are mixed in another sense as well, because the components of health projects range from goods that are almost purely public to those that are almost entirely private, with services showing various degrees of market failure in between. Some principal areas of market failure in the health sector are noted below.

Infectious Diseases

Much has been made of the “epidemiological transition,” the shift of the causes of mortality from infectious diseases to the noninfectious, chronic diseases typical of rich countries. Infectious diseases are still responsible, however, for a large proportion of deaths in poor countries, in particular, for deaths within poorer groups in those countries. They make a prima facie case for government intervention for three principal reasons.

First, they have distinct externalities. People with infectious diseases may not seek medical care quickly enough to avoid spreading the disease, and they may fail to complete a full course of treatment, which may lead to a resurgence of their illness, increased transmission, and increased risk of resistance to the drugs available for treatment. Similarly, for diseases for which transmission is decreased by the number of children immunized, an immunization program will confer an external benefit in addition to the benefit gained by the child immunized.

Second, some of the policy options available to fight infectious diseases are almost pure public goods; that is, no one can be excluded from using them, and use by one consumer does not preclude use by others. Goods of this kind will not be provided by the private sector. Control of disease-carrying pests (vector control) is one example. The collection and dissemination of health-sector informa-

Table 1. Female Adult Mortality Rates by Cause of Death and Income
(percentage of females dying between the ages of 15 and 60)

<i>Income quartile</i>	<i>Infectious diseases</i>	<i>Noninfectious diseases</i>	<i>Injuries</i>
Richest	0.4	6.7	1.2
2	0.4	7.9	2.0
3	0.6	7.6	2.4
Poorest	1.4	8.9	2.7

Source: Adapted from Murray, Yang, and Qiao (1992).

tion, epidemiological surveillance, and laboratories to monitor safe food, water, or drugs are others.

Third, infectious diseases disproportionately affect the poor. Table 1 shows the distribution of mortality by cause across different income groups of adult women in China. Although it is apparent that the poor suffer higher mortality from all causes, the rate at which they die relative to the nonpoor is very much higher for infectious than for noninfectious diseases (a factor of 3.5 as opposed to 1.3). If table 1 were extended to all age groups (in particular, to children), the relative effects of the kinds of diseases across income groups would be similar, but the incidence of infectious diseases would rise relative to noninfectious diseases. Any reallocation from infectious disease control to noninfectious disease control in China would therefore hurt the poor most.

Uncertainty and Incomplete Information

A second set of market failures relates to the problems of uncertainty and incomplete information that plague the health sector. Although intervention is often suggested to correct these problems, it should be used with a great deal of caution. No market offers complete information about the goods and services it produces. If medical services are underused because consumers have incomplete information, an information campaign might be sufficient to correct the problem. If consumers, once informed, do not change their behavior, they may be expressing opinions about the value of the goods and services, rather than indicating a market failure regarding information.

This being said, imperfect information takes a few specific forms in the health field. First, for preventive health measures with no associated marketable product (the value of washing hands after defecation, for example, or of wearing long sleeves in the evening to protect against malaria), private mechanisms for delivering information may be inadequate. News sources sometimes cover these issues, but the value of news media as purveyors of information may depend on literacy or on the existence of a free press.

Second, the natural asymmetry of information in clinical health services may lead to "supplier-induced demand." Medical practitioners, who know more about health problems than their patients know, may overtreat for financial gain. Government policy can sometimes improve welfare in such markets, although

the appropriate policy depends upon the specific ways in which the market works. Although some aspects of this problem have been modeled for the United States and the United Kingdom, there are few good models for the developing world.

Health Insurance and Efficiency Loss

Critical to the functioning of the health sector is the problem of catastrophic loss and the interaction of insurance markets with medical care markets (Griffin 1990). Routine care is not necessarily difficult for consumers to handle out of pocket. It is the infrequent but financially devastating incidents that are of concern. Health expenditures in all countries are skewed toward a small fraction of the population that accounts for a large share of total health expenditure. Insurance markets may fail, and even cease to exist, when those who think they will need care buy insurance, and those who think they will not, do not. The resulting higher costs of coverage will drive out still others who are relatively healthy, and the entire market may unravel. This phenomenon is known as "adverse selection."

Problems of "moral hazard" may also occur with regard to insurance. The insured may be less careful in preventing an outcome that is covered by insurance or in minimizing the cost of getting service. The service provider, in turn, may overcharge or overtreat insured clients in order to be reimbursed by the insurer. These effects of moral hazard may then lead to suboptimal insurance coverage, in that insurers may refuse to cover certain kinds of illnesses, treatments, or patients.

The absence of a well-functioning insurance market means that large numbers of people who would be willing to pay the actuarially fair rate to protect themselves from catastrophic illnesses are prevented from doing so. The welfare loss associated with the absence of insurance markets is particularly relevant to the case of expensive procedures, for which consumer demand for coverage is highest (Hammer and Berman 1995). In addition, the welfare gain per dollar spent to substitute for insurance will be highest for rare health problems, because these problems will have low expected costs against which to insure. The unpredictable nature of the demand for health care, combined with the widespread absence of insurance is a key feature leading to large discrepancies between the social and private benefits from care. The latent demand for medical insurance (as opposed to medical care), and the efficiency loss induced by its absence in developing countries is an especially neglected element in health economics. The recent Rand Corporation experiment in Indonesia is a notable exception (Gertler and Molyneaux 1995).

The Alleviation of Poverty

Although the health sector is frequently called upon to help alleviate poverty, public intervention for this purpose should be treated with care. The kinds of

goods that are the best vehicles for redistribution though subsidized services are generally those that have very low (preferably negative) income elasticities; that is, they should be goods or services that poor people consume relatively more of than others consume. Although the health of the poor is worse than that of other groups, the poor do not generally demand more health care than others do. It is more often the case, in fact, that income elasticities for expenditures on health care are very high—usually greater than 1 and often close to 1.5. In other words relatively rich people spend a greater proportion of their income on health care than do the poor. Subsidizing services across the board, therefore, would transfer money to the wealthy. Van der Gaag (1995), citing examples from China, Côte d'Ivoire, Indonesia, Peru, and Tanzania, notes that many public health systems, although justified on the basis of ensuring equity, provide higher subsidies to the relatively affluent. Solon and others (1991), for the Philippines, show that people with high incomes receive much more of the marginal (additional) dollar spent on public health facilities than they pay of the marginal dollar collected in taxes.

As noted, however, the prevention of infectious disease usually helps the poor more than it helps others. The wide variety of possible health services thus has an equally wide variety of possible effects for different income groups. Before interventions in the health sector are designed with poverty alleviation as an objective, their effects on the ultimate beneficiaries need to be carefully calculated. Many kinds of health subsidies will have a perverse result.

Market Failure and Analysis

The fact that markets fail is not in itself a justification for intervention. It is also not a reason to ignore economic analysis. When markets work well, the standard prescription of laissez-faire policies is adequate. It is precisely when markets fail, and welfare losses occur, that they should be carefully examined to determine how they have failed and what measures will most effectively improve welfare. More attention needs to be given to the behavior of consumers, providers, and the markets for medical care and insurance.

Some of the analytical methods proposed for use in the health sector ignore these essential features. Despite recognizing that the public sector should not rely on the cost-effectiveness of medical procedures as an allocative criterion,¹ the *World Development Report 1993* presents calculations of cost-effectiveness that are exclusively medical and that include none of the concerns discussed here (World Bank 1993, pp. 62, 117). Some readers have interpreted these numbers to mean that the higher the ratio of clinical benefits is to procedural costs, the higher will be the priority given to using public money for medical intervention.² Such calculations give no priority to infectious disease (or any other externality), no regard to the degree to which the private sector might substitute for the public, and no extra advantage to problems that disproportionately hurt the poor. With regard to risk and uncertainty, priorities based on the cost-

effectiveness of medical procedures can get things backwards.³ If the principal market failure in a particular context is the faulty insurance market, the items of highest priority for government intervention, from a welfare-improving point of view, should be those that are relatively expensive, holding possible health benefits constant. This preference is inversely related to the criterion of publicly funding the most cost-effective procedures (Hammer and Berman 1995).

Government Failures

Just as markets fail, so may government bureaucracies. Just as the behavior of private agents must be examined to judge how serious market failures may be, so must the behavior of public-sector health service providers. The issue of monitoring quality and providing appropriate incentives within the public sector is discussed in more detail at the end of the paper.

Establishing the Counterfactual

The second goal advocated by Devarajan, Squire, and Suthiwart-Narueput is to assess what would happen with and without the project. Three aspects of the health sector make this goal particularly germane. First, health care in most developing countries is characterized by a substantial private sector functioning alongside a large public sector. Second, as a service, health care is largely a nontraded good. Third, health status, a primary output of the health sector, is difficult to value monetarily, leading to a need to account carefully and separately for health status in the net output of the project.

Taking the last first, agreement on a measure of the value of life is unlikely ever to be reached, and keeping separate account of the health effects of a project will thus be necessary. Such accounting requires knowing the actual *level* of consumption of services (rather than the *value* of consumption of tradable goods, as in a standard analysis). As a nontraded good, consumption is equal to production and, if a competing private sector exists, nontraded good production can “crowd out” (or possibly “crowd in”) private production, leaving net changes in consumption as the focus of analysis.

Establishing the counterfactual therefore requires explicit modeling of demand for, and (nongovernmental) supply of, services. This underscores the value of identifying the market failure motivating the project. In this case, however, determining the behavior of the system will indicate the actual outcome of adding capacity to a market that has an active private sector, rather than simply providing a justification of the project. The standard literature on project evaluation takes nontraded goods into account by modifying the *prices* at which project outputs are valued (with the price capturing the net effect of project output on total market output). In the health sector, the reluctance to use prices on outputs such as lives saved means that the net contribution should be calculated

explicitly. The behavior of private-sector providers should also be analyzed to see if opportunities exist for improving services through regulation or subsidy that may be less expensive than direct public provision. Some elaboration of these points follows.

The Private Sector in Health

As table 2 shows, a large private sector is the rule in health care. With the likely underestimation of the use of traditional healers, the true size is larger still. This strongly suggests that the reaction of the private sector to public provision will be necessary to assess the net impact of the public intervention.

Valuing Output

The difficulty in valuing outputs that entail extensions to life is one principal reason why health projects have been exempt from formal economic evaluation. Although I shall not contribute to the long and ultimately unsatisfying literature on undertaking this valuation, some judgment is needed to make informed decisions on public interventions in health. A few points relevant to practical project evaluation are noted here.

Valuation is simply a way of aggregating disparate inputs and outputs to get a single number as a measure of a project's profitability. Most of the time prices are the appropriate weights for this measure. The most visible problem in the health sector is the weight to put on life as opposed to money. Many other kinds of outputs within the health sector may be similarly difficult to compare—improving abilities to perform daily functions, for example, or relieving pain and discomfort associated with different diseases—and for which there is no market mechanism for valuation. Beyond an individual's appraisal of different health problems, the value to society of curing these problems for persons of different ages or functions is often debated in the literature, representing another dimension of aggregation. In addition, many aspects of the output of health systems

Table 2. Public and Private Shares of Health Expenditures

(percentage of total expenditures)

<i>Region</i>	<i>Public and foreign aid</i>	<i>Private</i>
Established market economies	61	39
Middle East	57	43
Former socialist economies	71	29
India	22	78
China	59	41
Other Asian economies and the Pacific Islands	39	61
Latin America and the Caribbean	50	50
Sub-Saharan Africa	53	47

Source: Govindaraj, Murray, and Chellaraj (1995).

are not specifically related to health. Time spent traveling (or away from work) to reach clinics, waiting time, the courtesy of service providers, and many other facets of a very personal service have been repeatedly shown to be important to consumers.

There is no correct solution to the problem. Any method of valuation chosen must be accepted as arbitrary, treated tentatively, and scrutinized seriously to ensure that policy conclusions are not sensitive to implicit assumptions. It is sometimes proposed, for example, that the present discounted value of a person's income stream be used as the value of life. This "human capital" method of valuation ignores the fact that retirees consider their own lives valuable, and there is no logical or ethical reason why such persons should be ignored in social calculations. This method can be effective, however, if an evaluation is made using lost human capital as a lower bound for the true cost of a disease and still shows a project to be worthwhile (Kim and Benton 1995).

An ideal measure of the value of different kinds of health outcomes would combine the personal preferences of patients (using their own assessment of discomfort, inconvenience, life prospects, and responsibilities) with a more objective appraisal of the medical effectiveness of care. Because this combination of knowledge—personal from the patient, technical from the provider—does not reside in any one person, it is fundamentally unobservable.

A method that most closely approximates this measure is the "quality adjusted life year" used in some industrial countries (Barnum 1995). This measure relies on extensive interviews asking respondents to trade off certain kinds of health problems against others. Even with this method, however, the number is an average and does not allow for individual variation in preferences.

Some of the other methods used have no way of incorporating preferences of patients. Measures such as "healthy life years gained" or "disability adjusted life years" make arbitrary judgments about the relative weights of different kinds of afflictions and the relative social weights of years of life lost at different ages. Anand and Hanson (1995) challenge the underlying logic and ethical judgments implicit in this measure.

Even if a defensible life-value measure were obtained for a specific situation, generalizing it to contexts other than those captured in the measurement exercise would be difficult. A particular consideration is the degree of choice involved in the exposure to risks of death. One way of empirically estimating the value of life, for example, is to estimate wage differentials between safe and risky, but otherwise comparable, professions. Although the results of such studies are frequently interesting, they must be interpreted carefully. The subjects in the samples for the empirical work take risky jobs voluntarily. They may, therefore, be relative risk takers and not representative of the general public. Even if they differ little from others, however, there still remains the (ethical) concern that voluntarily taking risks is not the same as being exposed to risks without consent. Thus, deaths caused by motorcycle racing might be viewed differently from deaths from diseases caused by pollution (Viscusi 1992).

Although it has no solution, this problem cannot be avoided. It has sometimes been suggested that the difficulty in valuation can be circumvented by methods for which no value of life is needed. One such proposal is to use cost-effectiveness, which calculates the ratio of a given health impact from a medical intervention to its cost. Interventions with lower costs per health impact are then said to be preferred, and no explicit value of life is required. This strategy proves illusory in many of its proposed applications, however, in particular, in the choice between alternative treatment options in a clinical setting. It uses rate-of-return calculation to evaluate mutually exclusive options, a practice ruled out by the standard project evaluation literature (Hammer 1993a). An example of the way in which this method may yield unacceptable results is found in a paper by Sudre and others (1992), comparing different treatment options for malaria. Table 3 presents alternative program costs and the expected savings in lives for two different drugs. It is assumed that use of the drugs is mutually exclusive.

The authors note that if cost-effectiveness is used as the criterion for deciding between the two drugs, chloroquine will be selected. If the larger number of lives saved by pyrimethamine-sulfadoxine is considered, however, the implicit value of a life will make the two equivalent ($[\text{value of life}] \times 1,382 - 1,812 = [\text{value of life}] \times 1,723 - 2,622$ or $[\text{value of life}] = \2.38). They therefore conclude (p. 152) that "chloroquine would be the drug of choice only if the value of a death prevented were less than US\$2.38 (but greater than US\$1.31)." Not only is there an implicit value to life in the (supposedly value-free) use of cost-effectiveness ratios, but it is absurdly precise and ridiculously low.

Because the problem cannot be avoided, the best advice is to be modest and to examine the logical consequences of alternative valuations. Health effects should be presented separately from other outputs (at whatever level of aggregation satisfies the policy analyst) to allow alternative estimates for the same value.

One way around the valuation of life issue is provided by the National Schistosomiasis Control project for Egypt (World Bank 1992a). For this project the rate of return was calculated under the assumption that the "switching value" that would make the project fail to pass a 10 percent rate-of-return test can be calculated and shown to be unreasonably low (Table 4). This method will not always give clear answers, however. Sometimes the value of life so obtained will be within a reasonable range for such a number. At the least, though, this calculation could give the policymaker something to discuss.

Table 3. Costs and Effects of Alternative Treatments for Malaria

<i>Variable</i>	<i>Chloroquine</i>	<i>Pyrimethamine- sulfadoxine</i>
Lives saved	1,382	1,723
Program cost (U.S. dollars)	1,812	2,622
Cost per life saved (U.S. dollars)	1.31	1.52

Source: Sudre and others (1992).

Table 4. Rate of Return to a Schistosomiasis Control Program: Sensitivity Analysis

Implicit value of a year of life (U.S. dollars)	Deaths averted each year	
	Number	
	4,600	2,300
	Rate of return	
800	40	17
600	28	12
400	18	n.a.

n.a. = Not available

Source: World Bank (1992a).

Determining Private Sector Behavior

As argued above, because medical care is a nontraded service, public production or provision (or financing) may displace services in the private sector. Any estimate of improved health status attributable to public expenditure should consequently account for the displacement of private services. The size of the effect is an empirical matter and should constitute a substantial part of the sector work leading up to the project. It can be derived from the overall market structure, which should have been a central focus of that analysis.

Substantial research has been conducted recently on the determinants of demand for health care in developing countries and the substitutability of public and private providers. Although the effort has been largely directed at determining the effect of public-sector pricing on the use of health services (Akin and others 1985, 1986; Gertler and van der Gaag 1990), a growing number of studies have examined other aspects of demand likely to be affected by projects in health. A recent review by Alderman and Lavy (1996) examined the impact of location and quality of public health facilities on use. Table 5 reproduces some of the results.

The policy changes listed in table 5 are likely to be standard project components. Both can be counted on to decrease the numbers of persons who self-treat (do not visit a modern provider). When percent changes are weighted by the share of visits to each type of provider, however, they show that in Ghana 38 percent of new visits to public facilities in response to improved quality are attributable to reductions in visits to private facilities, as are 36 percent of visits in response to better access to public facilities. In Kenya fully 80 percent of the increased use of public facilities attributable to improved drug availability is accounted for by the drop in private facility use. If an evaluation were accurately to predict the increase in public facility use in response to the project but failed to account for the decrease in private sector use, the benefits (as some multiple of persons cured, say) would be overstated by a factor of five.

It is possible that the public sector provides better medical service than the private sector provides, and this quality differential should be examined (Ham-

Table 5. Effects of Public Facility Characteristics on Service Use
(percent)

<i>Policy simulation</i>	<i>Self care</i>	<i>Public facilities</i>	<i>Private facilities</i>
<i>Percentage change in patient use</i>			
<i>Ghana</i>			
Improve quality of care (infrastructure, materials, and staff)	-3.5	127.6	-19.5
Reduce distance to public facilities by 50 percent	-2.6	95.9	-14.9
<i>Kenya</i>			
Increase drug availability	-4.1	3.6	-4.1
Reduce distance to public facilities by 20 percent	-1.8	1.6	-1.8
<i>Share of market</i>			
Ghana	51	14	35
Kenya	39	36	25

Source: Alderman and Lavy (1996); Ghana: Lavy and Germain (1994); Kenya: Mwabu, Ainsworth, and Nyamete (1993).

mer 1993b). It is also possible that improved access to free public facilities (in Kenya) is good for redistributive purposes. Redistribution depends on whether the average clinic user is poorer than the average taxpayer. If public clinics are disproportionately in urban areas and taxes come from agriculture, even this redistributive benefit is unlikely to be realized. In either case, to assess improvements in either health care or equity, the analysis underpinning the project should identify the market structure, the degree of substitutability and differences in the quality of public and private care, and the relevant characteristics of the beneficiaries (consumers).

Although the demand side of the market has been analyzed in some depth, the characteristics of the supply of services have been less well explored, and market analyses combining both supply and demand are rare. Gertler and Molyneaux (1995) provide one study that incorporates information from both the demand and supply sides of the market. They estimate the impact of public facility fees on private sector fees for Indonesia and find a close connection. Net demand changes are dependent on both prices.

Alderman and Gertler (1989) estimate the effect on demand for both public and private services in Pakistan of changing the public sector price of care. Although they have no data available to estimate the private-sector supply response, they explore possible net market effects by means of a sensitivity analysis. They find that the total effect of raising fees in health centers depends on the induced price rise in the private sector, because both prices are determinants of service use. In the context of project evaluation, the same kind of information might be used to examine the effect of making extra services available through the public sector (using quantities provided rather than fees charged).

Because direct information on the supply response of private providers is rare—the Indonesia study is unusual in that the private supply response was actually measured—experimentation with different values in a sensitivity analysis, as in the Pakistan study, is a possible solution.⁴ In estimating the net effect of providing a competing service publicly, a simplifying assumption is that new public capacity enters the same market and has the same effect as new private capacity. If more detailed information suggests that the new public capacity has some other effect on the private sector, that effect should be included in sector work. New public capacity may reduce waiting times, for example, and it is time wasted waiting for free public services that generates the demand for private services. Whether or not the parameters (waiting time as determined by capacity, private sector demand as determined by waiting time) are known with certainty, estimates can be used to approximate the net effect of capacity. Alternatively, new facilities may decrease travel time, which was the source of private demand. Estimates of time savings and increased service use could be directly used in the project evaluation, combining information on demand as a function of distance with data on the geographical distribution of potential beneficiaries.

As these examples make clear, corrections for the impact of substitution with the private sector may be considerable. The degree of correction will be larger the larger the cross-price elasticity between public and private sectors, the larger the elasticity of supply of the private sector, and the smaller the overall elasticity of demand for services. Because many projects are long-lived (the expansion of clinic networks, the establishment of prevention programs), the relevant elasticity of supply is likely to be the long-run elasticity. Although this is more difficult to estimate accurately, it will probably be much larger than the short-run elasticity. In the short run, established private-sector practitioners may not move from their current location or change the number of hours they work. With a longer time horizon, practitioners may decide to enter or leave a local market depending on how much the public sector draws potential clients. Similarly, potential professionals (university students) may choose to enter more profitable fields if the medical profession becomes less attractive.

For the consumers elasticity of demand for services may differ greatly. Several studies have found that the price elasticity of demand for clinical care is higher for poor people than for others (Gertler and van der Gaag 1990). Projects designed to reach the poor may therefore need to adjust less for displacement effects. Pritchett (1994) finds, with respect to contraception, however, that the number of children a family has is closely correlated with the number it desires. The demand for contraceptives is thus likely to be highly inelastic. That is because the cost of contraceptives is very small compared with the cost of having children. Contraceptive products are likely to be very elastic in supply (although methods requiring professional providers will share the supply characteristics of other medical services); if supply were inelastic as well, the prices of contraceptives would fluctuate widely. With elastic supply and inelastic demand, public programs subsidizing or providing family planning services can be expected to

have very little effect. Pritchett's empirical work confirms this expectation. Pitt, Rosenzweig, and Gibbons (1993) and Gertler and Molyneaux (1994) find similar results for Indonesia, using very different kinds of data.

Another method of determining the net outcome of projects is to estimate the effect of previous expenditures in the public sector on health outcomes. This strategy was followed in a World Bank analysis of Malaysia and repeated for several other countries (World Bank 1992b, 1995). The analysis, using a panel of regions within the countries, estimates the effect of different kinds of public expenditures (usually contrasting primary preventive services with subsidized curative, clinical care) on measures of health status, controlling for income. The results for Malaysia and the Philippines are reported in table 6.

For Malaysia robust results indicated that variations in traditional kinds of public health interventions (immunization and provision of safe water) were highly significant in explaining declines in infant mortality, but that public provision of clinical care services had no effect on health status. For the Philippines the results were less robust, but some specifications suggested the same conclusion. The best fitting specification, however, reproduced in the table, indicates something quite different. The presence of a significant interaction term between regional income and public health subsidies suggests that providing services in poor areas has an important effect on health status, whereas providing services in rich areas has no effect at all. The best explanation for this is that the (large) private sector substitutes closely with the public sector in higher-income areas, resulting in a very elastic supply of private providers. In poor areas public

Table 6. Determinants of Infant Mortality
(coefficients from fixed effects panel estimation)

Variable	<i>Malaysia^a</i> (14 states, 1986-89)	<i>Philippines</i> (13 regions, 1983-90)
Income	-1.06 (0.97)	-0.223 (0.042)
Safe water	-0.147 (0.05)	-0.026 (0.027)
Immunization: diphtheria, pertussis, tetanus (DPT)	-0.113 (0.04)	-0.018 (0.013)
Publicly employed medical personnel per capita	1.03 (0.79)	
Public health expenditure		-0.404 (0.113)
Public health expenditure × income		0.041 (0.012)
Adjusted R ²	0.55	0.988

Note: Standard errors are in parentheses.

a. Instrumental variables estimation, DPT as endogenous.

Source: Hammer, Nabi, and Cercone (1995); World Bank (1995).

provision substantially increases access to health care because of a significantly less-elastic private supply response.

For certain kinds of projects, such as some forms of vector control, sanitation, or some kinds of health education and promotion activities, it is impossible to charge for specific services, and there will thus be no private sector at all. For such projects, no correction for the displacement of services need be made. For services in which private sectors compete with the public sector, the private-sector counterfactual should be determined. In terms of substantive changes, this calculation is likely to raise the priority of population-based, public goods projects, which have a substantial overlap with traditional public health interventions, and to lower the priority of clinic-based, patient-initiated services, for which the private sector can, and almost always does, exist.

This will not always be true, however, as the case of the Philippines illustrates. Indeed, consideration of the effect of projects on the private sector will not *necessarily* reduce the value of the public investment. The World Bank analysis of the health sector in Malaysia (World Bank 1992b), for example, suggests that the existence of a reliable public health service in that country has provided competition to the private sector that has effectively held down fees. This welfare improvement from the public service could not have been estimated solely from the characteristics of the public program; it needed to be understood in the context of the industrial organization of the entire sector. The general lesson is that market structures in poor countries differ substantially, and predicted effects of health projects can go quite wrong if the preparatory sector work is lacking.

Fiscal Impact, Fees, and Projects

The third point made by Devarajan, Squire, and Suthiwart-Narueput is that public funds for investment come at a premium because of the distortionary effects of the taxes needed to collect them. Estimates in the literature indicate losses that are on the order of 30 to 50 percent in industrial countries and that are even greater for developing countries. In many poor countries, which may have underdeveloped tax systems relying heavily on export taxes on agriculture, the distributional effects of higher taxation can make this cost even higher. This situation leads to three main conclusions relevant to health sector projects. First, too many projects are accepted using conventional project evaluation methods. Second, opportunities for recovering costs in the project should be explored. Third, alternative, perhaps cheaper, methods should be examined for correcting the market failure that initially justified the project. Regulations, partial subsidies, or even taxation may be as effective as project funding in improving the market outcome.

As applied to the health sector, the first conclusion suggests that public expenditures should correct only market failures for which the welfare costs are at least as high as the damage caused by the taxes needed to finance them. Because

formal project analysis has not been applied in health and so cannot have led to a bias in favor of public-sector delivery, ignoring the cost of public funds has probably led to a similar, if informal, bias.

The second conclusion, that options for cost recovery should be explored, lands squarely in the middle of a long-standing controversy in the health field (Creese 1991; Griffin and Shaw 1995). A few points from the analysis in Devarajan, Squire, and Suthiwart-Narueput might clarify this issue. First, many of the services offered in health care are private goods, whether or not they are delivered by the private sector. Fees can be charged for these services and nonpayers excluded from them, even if charges are not currently levied. If there is a premium on public funds (or a budget constraint for the health ministry), the decisions about which projects to support and how much to charge should be made jointly.

Whether and how much to charge depends on balancing two opposing concerns (Hammer 1993b). Because charging fees will reduce the drain on the government budget for a given project (or allow a fixed budget to be stretched further), cost recovery will translate into a higher priority for any particular project. Raising fees will, however, reduce demand for the publicly provided services. The question to ask is what the consequences are likely to be of failing to get that care. How many consumers will be dissuaded by higher fees from seeking publicly provided care, and what difference will it make to their health?

The effect on individual health depends on several factors. First, do people stop seeking treatment altogether, or do they switch to care provided by the private sector? Are the health conditions for which they stop seeking care likely to be serious or not? Second, what is the relative effectiveness of treatment in the public and private sectors? To put it starkly, if as a result of higher fees, people are staying away from clinics for treatment of muscle aches and skin rashes (a large component of demand for local hospital services in Indonesia) or are buying the same over-the-counter treatments that they would get from the public facility, that is one thing. If they are sitting home, infecting others, and dying of tuberculosis, that is quite another.

Who benefits from fee increases, and how, also depends on whether the money collected is retained by the clinics and used to improve the quality of service. Jimenez (1987) shows the conditions under which the improvement in quality can outweigh the financial burden of the fees. Litvack and Bodart (1993) demonstrate just such an effect in Cameroon and argue that poor people in particular benefit in terms of overall access to services from the combined effects of fees and improvements in quality.

Fees are least likely to harm the health status of consumers when (1) the demand for care at public facilities is inelastic, that is, when higher fees do not dissuade clients from using public clinics; *or* (2) demand at public facilities is elastic but clients continue to use the facilities for more serious conditions and stop using them for minor ailments; *or* (3) demand at public facilities is elastic but private facilities are close substitutes, that is, the cross-price elasticity of

demand is high and private supply is also elastic, meaning that clients stop using public facilities but still receive care at private clinics; *and* (4) private care is effective. If the private sector is characterized by modern providers, such as nongovernmental organizations (NGOs) or public providers in their off hours (as is legal and standard practice in Indonesia), a shift in use from public to private service does no harm to health status. If the private sector consists of traditional healers with no particular skills (not true of all traditional healers), increasing demand for their services is harmful.

To judge the effect of fees, therefore, it is necessary to know a fair amount about the demand for services and the nature of the supply of private services. As mentioned above, market characteristics such as demand elasticities (sometimes with cross-price effects) are known from research but vary substantially from country to country. They cannot be confidently inferred from one country to another and should be investigated in the specific context of the sector work under way. Some market characteristics need to be examined more thoroughly, such as symptom-specific demands for services, which can help explain whether people stop using life-saving care. Note that information about the cost-effectiveness of medical treatments is *not* part of the essential information needed to determine which services should be provided at subsidized rates in the public sector. Cost-effectiveness shows up only with regard to the difference in effectiveness between public and private care.

Third, the high cost of public funds implies that more effort should be given to looking for policies other than subsidized provision or financing to correct market failures. Monitoring and regulating a private sector may be such an option for ensuring high standards of care at a lower cost to the government. The same might be true for private insurance. Similarly, if imperfect information is a key element in the health market, providing information concerning the quality and effectiveness of private providers can be an important public role (van der Gaag 1995).

The information needed to choose between regulating and providing services is, unfortunately, usually lacking. Similarly, the functioning of insurance markets in the health sector is not sufficiently understood to be able to prescribe confidently the appropriate regulatory framework. Recent experiments in the provision of insurance should shed light on this issue (Griffin and Shaw 1995).

Fungibility and Other Issues of Public Servant Behavior

Devarajan, Squire, and Suthiwart-Narueput note that the true effect of project funds may have little to do with the specifics of the project being evaluated. The government may have intended to start the project anyway, and the extra money simply allows it to finance another project that it may have considered marginal. Donors may be unaware of the project they are actually funding, much less be able to evaluate it. Much of the force of this argument comes from the

significantly larger scope for reallocations between, rather than within, sectors, but it also has relevance to possible reallocations within health ministries. Since the Alma Ata conference in 1977, the international public health community has stressed the need to shift resources toward basic primary care. As a result, much of the public health funding available from donors has been directed toward primary care. When governments' actual allocations are examined, however, evaluators find that large portions of the budgets are directed toward services that do not conform to the primary care model.

Source of 'Government Failure'

The fact that actual allocations differ so substantially from the international paradigm suggests that the ministries' decisions are determined by internal factors, such as political pressure from providers or affluent consumers. It is also entirely possible that governments count on project financing from donors to fund the basic services (immunizations, rural care), leaving the ministries free to satisfy pressures to provide or subsidize urban, tertiary services.

A recent paper by Feyzioglu, Swaroop, and Zhu (1996) analyzes the effect of foreign aid on public expenditure patterns. Within the health sector, the authors find that although foreign aid earmarked for the health sector has reduced infant mortality in recipient countries, the governments' own resources spent on health have not. This finding suggests that governments' allocations compensate for the preferences of donors, and it reinforces the point made by Devarajan, Squire, and Suthiwart-Narueput that projects should be evaluated in the context of the overall sectoral strategy or by reviews of public expenditures across the board. To the extent that money is fungible within ministries, this advice seems warranted.

Incentives

Critical to effective project analysis is an understanding of the goals, incentives, and constraints of governments and their workers. Behavior is at the heart of "government failure," fungibility, and the decision to provide, rather than regulate, services. The incentives facing senior policymakers, as well as their behavior, must be known to understand the fungibility of resources. To understand the true impact of a project, the same information must be gathered about the civil servants responsible for project implementation. To decide between providing and regulating services, the incentives to private providers—as well as to civil servants—their probable behavior, and the ability of policymakers to influence those incentives must be considered.

Although considerable intellectual effort has gone into defining the right prices by which to value outputs of projects, the inputs and outputs themselves are largely treated as given. The guidelines drawn up by UNIDO (United Nations Industrial Development Organization) were one of the original standard texts in

the field; they state that project evaluation is divided into ten steps. The first is to "ascertain the 'net output' of the project and split it into adding to supply and saving resources" (UNIDO 1972, p. 50); the next nine deal with shadow pricing (imputed valuations) and the like. In addition, much of the discussion of the first step concerns splitting up the outputs; almost nothing is written about "ascertaining the net output."

It is naive to assume that project inputs will achieve their intended results irrespective of the incentive structure facing those responsible for them. These incentives may be specific to the individuals actually constructing the project and running the enterprise (if it is kept in public hands) or may affect private agents (such as farmers in an irrigation project) during the period when project benefits are generated. The former category raises issues of ownership at the higher levels of supervision and issues of civil service remuneration or contracting procedures at the lower levels. The latter, which has been the subject of numerous analyses, depends on the policy framework within which the project operates. In a recent analysis of incentives, Pritchett (1996) finds that the discrepancy between the value of capital as determined by accumulated costs of investments and its value as determined by contribution to output (marginal productivity) varies enormously across countries. This discrepancy is attributed to the economic environment in which the investments have been made and argues strongly against using simple input-output relationships that are independent of the incentives faced by people working with invested capital.

The incentive structure is especially important for evaluations of health sector projects, because health care is a service. Its value therefore depends upon maintaining incentives to service providers for sustained good performance. Just because a health clinic is built does not mean the providers will show up for work. And if they do come to work, there is no guarantee they will devote themselves to the care of their patients. The actual output of the investment depends on policies concerning pay and other incentives for good performance in public employment. Just as incentives facing people in the private sector should be examined for evidence of market failures, so should incentives in the public sector be examined for evidence of government failures.

Recent analyses of public health systems point to serious problems in this regard. One indication of these problems is the common bypassing of local public health facilities for private (or higher-level public) facilities even when the public service is free (Kloos 1990; Korte and others 1992). Among the reasons given for this are lack of concern shown by the public provider, social distance between the medical practitioner and his or her clients (exacerbated by assigning doctors to ethnic areas different from their own), and other aspects of the behavior and degree of commitment of the civil service doctor.

Lewis, Sulvetta, and LaForgia (1991, 1996) point to profound problems in the technical efficiency of public hospitals and clinics. In one study in the Dominican Republic, the proportion of expenditures actually reaching patients as services is estimated to be as low as 12 percent. Once again, the incentive struc-

ture, in this case for hospital administrators, is central to the problem. If the financial viability of the enterprise has no impact on pay and promotion, the quality of management is likely to suffer.

In sector work on Indonesia (World Bank 1994), a particular dilemma was identified. Regional variation in epidemiological conditions and the variety of tasks expected of public health employees argued for increased local discretion in the allocation of resources. The incentive system in place, however, which allowed doctors to maintain private practices in public facilities (in the afternoon when the public facilities were closed), raised the possibility that this discretion would be used perversely, leading to heavier reliance on clinic-based activities to the detriment of outreach and population-based public health concerns. Reforms were recommended to compensate public providers who better served public priorities.

It is widely believed that a consequence of fee-for-service private care is the tendency of doctors to overtreat so that they gain more income from more extensive service. A fair question is whether the same doctor on salary will undertreat or badly treat if there are no financial consequences for failing to satisfy customers. Both problems can, in principle, be addressed by careful monitoring and appropriate sanctions. As important as the issue is, however, little is known about the relative abilities of governments to manage public systems or regulate private systems.

Conclusion

This article has tried to show how the issues raised by Devarajan, Squire, and Suthiwart-Narueput might be applied to project evaluation in health. Although the health sector is characterized by several market failures that may justify public-sector involvement, the existence of imperfectly competitive markets should not be used to ward off economists and to justify simply any intervention. Specific market failures should be identified, and the analyses identifying them should give guidance on ways to correct for them.

The inadequacy of insurance markets is one characteristic of the health sector. This market failure should lead to an analysis of, and attempts to measure, the value of the reduced insecurity that a project might offer to beneficiaries. Also characteristic of the health sector are services that either are pure public goods (pest control) or have distinct external effects (infectious disease control). In addition, health projects are often promoted to alleviate poverty. Different kinds of services, however, have very different distributional characteristics. Basic sanitation, hygiene, and even the education of girls from poor families may have a greater impact on the health of the poor than will general subsidies to clinical services. It should be noted that none of these three areas—risk, external effects, and poverty alleviation—are handled by current applications of cost-effectiveness analysis.

With regard to establishing the counterfactual, the trick is to give a full account of what will happen with the project *taking into account the reaction of other actors in the health system*: the consumers, private providers (including traditional healers), NGOs, and insurers (including informal credit or private transfers). Because health is largely a nontraded good, the participation of the government will affect the overall consumption of health services. Being aware of such features of the medical service market as demand elasticities (with respect to prices as well as to project characteristics such as service location or quality) and supply elasticities of private providers (particularly with regard to price or the existence of a competitive public sector) is critical to being able to establish this reaction.

The third element, determining the fiscal impact of the project, suggests that the premium on public money should lead to a search for alternatives to subsidized provision. In health the setting of fees for clinical services is the most important area in which this issue arises. This paper argues that higher subsidies should be directed toward services that have higher social returns relative to private returns and, of those that warrant subsidy, to those that have more elastic demand. It is important to know when raising prices will be counterproductive (for example, for services with high price elasticities) and when money can be saved for other high-priority needs by charging fees (for example, for services with low price elasticities).

The fourth component of good project analysis, acknowledging the fungibility of project resources, relates to the much broader issue of understanding the behavior (motives and incentives) of public servants. The motives of high-level public servants are likely to be an issue in the health sector if donor funds earmarked for primary health care free up domestic funds for services on which those donors would place low priority. More fundamental, however, is understanding the incentives that will encourage civil servants or government contractors to provide high quality, responsible care. Virtually all projects assume that project inputs are used appropriately and that the output is known (at least in terms of numbers of patients seen at some assumed level of quality). This assumption is not valid for analyzing services, and the incentive structure of service providers should be a far more important topic for analysis and research than it has been.

Much of the analysis relevant to projects should be done before the project evaluation stage. Indeed, given the issues of fungibility and incentives, the best form of intervention by donors may not be through traditional projects at all but, rather, through general loans conditioned on overall sector strategy and reform. If a standard project is proposed, however, considerable information from supporting sector work will be needed before evaluation. In particular, if clinical or other services that require public participation are part of the project, the supply and demand for substitute services will need to be known. Just as shadow (imputed) exchange or wage rates for project evaluation should be derived from supporting economic work done before

the specific project, so should the market structure of health be part of the background investigation.

Adequate market analyses are rare in developing countries. What, then, should project evaluation look like before such analyses become available? First, evaluators should be serious about collecting information. In the interim, projects may be designed to focus on the principal market failures that such research is likely to uncover. Evaluations of health activities that are pure public goods or that address genuine externalities will be little affected by more detailed market analysis and so may proceed. For projects in which poverty alleviation is central, it should be established that the project beneficiaries are, in fact, the poor. Health care as a redistributive device should be used with caution, unless by geographic placement or other means, the poor can be encouraged to take advantage of the health services and others discouraged. For other projects, with large clinical components, more scrutiny is needed. Without knowing much about the market the government will enter or the incentive structure for public providers, it is difficult to know what health effects (or even service use) will result from a project. Estimates of the elasticity of demand for services specific to the country and guesses concerning the elasticity of competitive supply should be incorporated as weights on predicted project outputs. Identifying these parameters should be the focus of future analyses of the sector, and the absence of information on these parameters should encourage caution on the part of project evaluators.

Notes

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1. "Using cost-effectiveness to select health interventions for public financing does not necessarily mean spending the most resources where the burden of disease is greatest. Instead, it means concentrating on the interventions that offer the greatest possible gain in health per public dollar spent. The relevant comparison is usually not with a situation in which nothing is done but with the situation created by privately financed health interventions" (World Bank 1993, p. 65).

2. Bobadilla and Saxenian (1993, p. 10), for example, precede their reference to the medical intervention numbers by stating: "That is why the first step in designing a country's essential health package is to determine the cost-effectiveness of a health intervention—the net gain in health compared with doing nothing, divided by the cost."

3. The contribution a particular health problem makes to the overall burden of disease has also been suggested as a criterion for setting priorities for public intervention (Murray and Lopez 1994). This is also incorrect for contexts in which the main market failure is in insurance. The health conditions that will be most seriously underfinanced (in welfare terms) in the absence of an insurance market are the rare ones, rather than the common ones. With a few exceptions, the total impact of a problem is irrelevant to decisionmaking, the pertinent criterion being the marginal impact a policy will have in correcting the problem. The exceptions are pure research in which neither the potential cost nor the likeli-

hood of success is known and cases in which strong economies of scale can be demonstrated (Murray and Lopez 1994).

4. A shortcut for estimating the net effect of providing a competing service publicly is available from the author.

References

The word "processed" describes informally reproduced works that may not be commonly available through library systems.

Akin, John S., Charles Griffin, David Guilkey, and Barry Popkin. 1985. *The Demand for Primary Health Services in the Third World*. Totowa, N.J.: Rowan and Allenheld.

———. 1986. "The Demand for Outpatient Services in the Bicol Region of the Philippines." *Social Science and Medicine* 22(3):321–27.

Alderman, Harold, and Paul Gertler. 1989. *Substitutability of Public and Private Health Care for the Treatment of Children in Pakistan*. Living Standards Measurement Study Working Paper 57. Washington D.C.: World Bank.

Alderman, Harold, and Victor Lavy. 1996. "Household Responses to Public Health Services: Cost and Quality Tradeoffs." *The World Bank Research Observer* 11(1):3–22.

Anand, Sudhir, and Karen Hanson. 1995. "Disability Adjusted Life Years: A Critical Review." Working Paper 95.06. Harvard Center for Population and Development Studies, Cambridge, Mass. Processed.

Barnum, Howard. 1995. "Economic Evaluation of Health Projects." World Bank, Operations Policy Department, Washington, D.C. Processed.

Bobadilla, Jose-Luis, and Helen Saxenian. 1993. "Designing an Essential National Health Package." *Finance and Development* 30(3):10–13.

Creese, Andrew. 1991. "User Charges for Health Care: A Review of Recent Experience." *Health Policy and Planning* 6(4):309–19.

Devarajan, Shantayanan, Lyn Squire, and Sethaput Suthiwart-Narueput. 1996. "Reviving Project Analysis at the World Bank." Policy Research Working Paper 1496. World Bank, Policy Research Department, Washington, D.C. Processed.

Feyzioglu, Tarhan, Vinaya Swaroop, and Min Zhu. 1996. "The Impact of Foreign Aid on Public Spending." World Bank, Policy Research Department, Washington, D.C. Processed.

Gertler, Paul, and Jacques van der Gaag. 1990. *The Willingness to Pay for Medical Care: Evidence from Two Developing Countries*, Baltimore, Md.: The Johns Hopkins University Press.

Gertler, Paul, and John Molyneaux. 1994. "How Economic Development and Family Planning Programs Combined to Reduce Indonesian Fertility." *Demography* 31(1):33–63.

———. 1995. "Pricing Public Health Care Services: Lessons from a Social Experiment in Indonesia." Rand Corporation, Santa Monica, Calif. Processed.

Govindaraj, Ramesh, Christopher J. L. Murray, and Gnanaraj Chellaraj. 1995. *Health Expenditures in Latin America*. World Bank Technical Paper 274. Washington D.C.

Griffin, Charles. 1990. "Health Sector Financing in Asia." World Bank Report 8553-ASI. Washington, D.C. Processed.

Griffin, Charles, and Paul Shaw. 1995. *Financing Health Care in Sub-Saharan Africa through User Fees and Insurance*. Directions in Development Series. Washington, D.C.: World Bank.

Hammer, Jeffrey S. 1993a. "The Economics of Malaria Control." *The World Bank Research Observer* 8(1):1–22.

- . 1993b. "Prices and Protocols in Public Health Care." Policy Research Working Paper 1131. World Bank, Population and Human Resources Department, Washington, D.C. Processed.
- Hammer, Jeffrey S., Ijaz Nabi, and James Cercone. 1995. "Distributional Effects of Social Sector Expenditures in Malaysia, 1974 to 1989." In Dominique van de Walle and Kimberly Nead, eds., *Public Spending and the Poor: Theory and Evidence*. Baltimore, Md.: The Johns Hopkins University Press.
- Hammer, Jeffrey S., and Peter Berman. 1995. "Ends and Means in Public Health Policy in Developing Countries." In Peter Berman, ed., *Health Sector Reform in Developing Countries*. Cambridge, Mass.: Harvard University Press.
- Jimenez, Emanuel. 1987. *Pricing Policy in the Social Sectors: Cost Recovery for Education and Health in Developing Countries*. Baltimore, Md.: The Johns Hopkins University Press.
- Kim, Ah-Yung, and Bruce Benton. 1995. *Cost-Benefit Analysis of the Onchocerciasis Control Program*. World Bank Technical Paper 282. Washington, D.C.
- Kloos, Helmut. 1990. "Utilization of Selected Hospitals, Health Centers, and Health Stations in Central, Southern, and Western Ethiopia." *Social Science and Medicine* 31(2):101-14.
- Korte, R., H. Richter, F. Merkle, and H. Gorgen. 1992. "Financing Health Services in Sub-Saharan Africa: Options for Decision Makers during Adjustment." *Social Science and Medicine* 34(1):1-9.
- Lavy, Victor, and Jean-Marc Germain. 1994. *Quality and Cost in Health Care Choice in Developing Countries*. Living Standards Measurement Study Working Paper 105. Washington, D.C.: World Bank.
- Lewis, Maureen, Margaret Sulvetta, and Gerard LaForgia. 1991. "Productivity and Quality of Public Hospital Medical Staff: A Dominican Case Study." *International Journal of Health Planning and Management* 6(4):287-99.
- . 1996. "Measuring Public Hospital Costs: Empirical Evidence from the Dominican Republic." *Social Science and Medicine* 43(2):221-34.
- Litvack, Jennie, and Claude Bodart. 1993. "User Fees and Improved Quality of Health Care Equals Improved Access: Results of a Field Experiment in Cameroon." *Social Science and Medicine* 37(3):369-89.
- Murray, Christopher J. L., and Alan D. Lopez. 1994. *Global Comparative Assessments in the Health Sector: Disease Burden, Expenditures, and Intervention Packages*. Geneva: World Health Organization.
- Murray, Christopher J. L., Gonghuan Yang, and Xinjian Qiao. 1992. "Adult Mortality: Levels, Patterns, and Causes." In Richard G. A. Feachem, Tord Kjellstrom, Christopher J. L. Murray, Mead Over, and Margaret A. Phillips, eds., *The Health of Adults in the Developing World*. New York: Oxford University Press.
- Mwabu, Germano, Martha Ainsworth, and Andrew Nyamete. 1993. "Quality of Medical Care and Choice of Medical Treatment in Kenya: An Empirical Analysis." *Journal of Human Resources* 28(4):838-62.
- Pitt, Mark, Mark Rosenzweig, and Donna Gibbons. 1993. "The Determinants and Consequences of the Placement of Government Programs in Indonesia." *The World Bank Economic Review* 7(3):319-48.
- Pritchett, Lant. 1994. "Desired Family Size and the Impact of Population Policies." *Population and Development Review* 20(1):1-55.
- . 1996. "Minding the P's and Q's: The Cost of Investment and the Value of Capital." World Bank, Policy Research Department, Washington, D.C. Processed.
- Solon, Orville, and others. 1991. "Health Sector Financing in the Philippines." Research Triangle Institute and University of the Philippines School of Economics, Manila. Processed.

- Sudre, Philippe, Joel Breman, Deborah McFarland, and Jeffrey Koplan. 1992. "Treatment of Chloroquine-Resistant Malaria in African Children: A Cost-Effectiveness Analysis." *International Journal of Epidemiology* 21(1):146-54.
- UNIDO (United Nations Industrial Development Organization). 1972. *Guidelines for Project Evaluation*. New York.
- van der Gaag, Jacques. 1995. *Private and Public Initiatives: Working Together for Health and Education*. Directions in Development Series. Washington, D.C.: World Bank.
- Viscusi, W. Kip. 1992. *Fatal Tradeoffs: Public and Private Responsibilities for Risk*. New York: Oxford University Press.
- World Bank. 1992a. "Arab Republic of Egypt: National Schistosomiasis Control Project." Staff Appraisal Report 10513-EGT. Washington, D.C. Processed.
- . 1992b. "Malaysia: Fiscal Reform for Stable Growth." East Asia Department I, Washington, D.C. Processed.
- . 1993. *World Development Report 1993: Investing in Health*. New York: Oxford University Press.
- . 1994. "Indonesia's Health Work Force: Issues and Options." East Asia Department 3, Washington, D.C. Processed.
- . 1995. "Philippines: Public Expenditure Review." East Asia Department I, Washington, D.C. Processed.