The roles of the government and the market in health

World spending on health totaled about $1,700 billion in 1990, or 8 percent of global income. Of this, governments spent more than $1,000 billion, or nearly 60 percent. Of the $170 billion spent on health in the developing countries of Africa, Asia, and Latin America, governments spent half the total amount—2 percent of those regions' GNP. In the established market economies, where total health spending was almost $1,500 billion, governments spent just over $900 billion—more than 5 percent of GNP (Table 3.1). The sheer size of these expenditures on health makes it critical to understand the impact of government policies on people's health. But governments profoundly influence health in less direct ways, through their policies toward education, water supply, sanitation, and other sectors important for health, as well as through regulation of health systems, health providers, and insurers. Governments further affect health by their impact on household income and educational levels (as discussed in Chapter 2), by financing public health services, and by providing care directly. What governments do varies enormously from country to country, but every government plays an important role.

Three economic rationales justify and guide a government role in health. They are discussed in greater detail in "The rationales for government action," below.

- The poor cannot always afford health care that would improve their productivity and well-being. Publicly financed investment in the health

<table>
<thead>
<tr>
<th>Demographic region</th>
<th>Percentage of world population</th>
<th>Total health expenditure (billions of dollars)</th>
<th>Health expenditure as percentage of world total</th>
<th>Health expenditure as percentage of regional total</th>
<th>Percentage of GNP spent on health</th>
<th>Per capita health expenditure (dollars)</th>
<th>Ratio of per capita spending (SSA = 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Established market economies</td>
<td>15</td>
<td>1,483</td>
<td>87</td>
<td>60</td>
<td>9.2</td>
<td>1,860</td>
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<td>142</td>
<td>6.0</td>
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<tr>
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<td>47</td>
<td>3</td>
<td>60</td>
<td>4.0</td>
<td>105</td>
<td>4.5</td>
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<tr>
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<td>39</td>
<td>2</td>
<td>58</td>
<td>4.1</td>
<td>77</td>
<td>3.3</td>
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<td>2</td>
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<td>18</td>
<td>1</td>
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<td>6.0</td>
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<td>0.9</td>
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<tr>
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<td>1</td>
<td>59</td>
<td>3.5</td>
<td>11</td>
<td>0.5</td>
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<td>4.5</td>
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<tr>
<td>Demographically developing countries</td>
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<tr>
<td>World</td>
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<td>100</td>
<td>60</td>
<td>8.0</td>
<td>329</td>
<td>13.7</td>
</tr>
</tbody>
</table>

Note: SSA, Sub-Saharan Africa.
Source: Appendix table A.9.
of the poor can reduce poverty or alleviate its consequences.

- Some actions that promote health are pure public goods or create large positive externalities. Private markets would not produce them at all or would produce too little.
- Market failures in health care and health insurance mean that government intervention can raise welfare by improving how those markets function.

Any potential benefits from greater public sector involvement in health must be weighed against the risk that governments will in fact make matters worse. For example, to satisfy special interest groups, governments may adopt policies that reduce the general welfare. Even when they choose correct policies, they may fail to implement them properly.

Governments have a responsibility to spend well, to get "value for money," whenever they devote public resources to health. This means allocating resources so as to obtain the most improvement in health per public dollar, taking into account the private market's response to public sector spending. Because private health care markets can also fail to achieve value for money, government policy has a role in providing information and incentives to improve the allocation of resources by the private sector. In most of the world a great deal of additional health could be obtained from a relatively small number of cost-effective interventions that could be delivered at modest cost and with little need for high-level facilities or medical specialties.

**Health expenditures and outcomes**

Chapter 1 showed how greatly health status differs among populations. Life expectancy ranges from forty years or less in some countries of Sub-Saharan Africa to seventy-five or more in the established market economies. In Sub-Saharan Africa half of all deaths occur under age 5; in the established market economies half occur after age 74. Child mortality rates exceed 200 per 1,000 in several African countries but are below 20 in the richest countries. The burden of disease is five times higher, per capita, in the worst-off than in the healthiest regions.

Three factors help to explain these huge differences. The first is human behavior. Chapter 2 showed that both health and the capacity to improve health are related to income and education and to the changes in behavior that wealth and education bring. The second factor is the amount and effectiveness of expenditure in the health system. The third factor is the range of diseases present, which is determined largely by climate and geography. Effective health policy takes account of different disease prevalences but is not simply determined by them.

Differences in health spending are an obvious starting point in the search for an explanation of differences in health. In 1990 total annual health spending ranged from less than $10 per person in several African and Asian countries to more than $2,700 in the United States. There was also considerable variation within regions. In Africa, Tanzania spent only $4 per capita for health in 1990, while Zimbabwe spent $42 per person. In Asia, Bangladesh spent $7 per person each year, as against $377 in Korea. Since the share of GNP devoted to health tends to rise with income, rich countries differ from poor ones even more in health expenditure than in income.

But health spending alone cannot explain all the variation in health among countries. Nor can income and education, or even spending, income, and schooling taken together. Figure 3.1 illustrates the discrepancies. The vertical axis shows how far life expectancy in a country differs from the value predicted on the basis of that country's income and average schooling. France, Haiti, Singapore, and Syria have almost exactly the life expectancy predicted. China, Costa Rica, Honduras, and Sri Lanka, in the top half of the figure, all achieve five years or more of life beyond what would be expected. Egypt, Ghana, Malawi, Uganda, the United States, and Zambia, in the bottom half of the figure, all have a life expectancy about five years lower than expected, given their levels of income and education.

The horizontal axis of Figure 3.1 shows how far total health spending differs from the value predicted by income and education. Egypt, Morocco, Paraguay, Singapore, and Syria, in the left half of the figure, spend relatively little. France, Haiti, India, Mozambique, and the United States, in the right half, spend more than expected.

At any level of income and education, higher health spending should yield better health, all else being equal. But there is no evidence of such a relation. Countries are scattered in all quadrants of the figure. The countries that appear in the upper-left quadrant obtain better health for less money.

China, for instance, spends a full percentage point less of its GNP on health than other countries at the same stage of development but obtains nearly
Health expenditure, income, and schooling only partly explain variation in life expectancy.

Figure 3.1 Life expectancies and health expenditures in selected countries: deviations from estimates based on GDP and schooling

Deviation from predicted life expectancy (years)

![Graph showing deviations from predicted life expectancy](image)

Source: World Bank data.

ten years of additional life expectancy. Singapore spends about 4 percent less of its income on health than others at the same level of development but achieves the same life expectancy. Other countries, of which Costa Rica and India are examples, obtain relatively good health results but also spend relatively more. (In the case of India health spending is low and health status is poor, but even lower spending and worse status would be expected for a country with such low levels of income and schooling.) Egypt and Zambia, by contrast, get poor health for a lower-than-predicted level of spending. Finally, it is possible both to spend more than predicted on health care and still achieve unexpectedly poor results. The United States is an extreme case, spending 5 percent more of GNP than predicted to achieve several years less of life expectancy than would be typical for its high income and high educational level.

Analyses using other measures of health status, such as child mortality, yield similar results. This raises obvious and important questions. What accounts for these large deviations? How much is attributable to the characteristics of health systems? How can public policy help to provide better health outcomes for a given national effort?

The rationales for government action

Public policy in health is successful if it leads to increased welfare through better health outcomes, greater equity, more consumer satisfaction, or lower
total cost than would occur in the absence of public action. Of course, the pursuit of one or more of these objectives does not by itself justify government intervention. There must be a basis for believing that the government can achieve a better outcome than private markets can. There are three broad reasons why that belief may be true: one centers on poverty and the equitable distribution of health care and the other two involve market failures.

Reduction or alleviation of poverty provides a straightforward rationale for public intervention in health. Success in reducing poverty requires two equally important strategies: promoting the use of the most important asset of the poor—their labor—and increasing their human capital through access to basic health care, education, and nutrition. As Chapter 1 showed, investment in the health of the poor raises their educability and productivity. It gives them both the assets they need to lift themselves from poverty and the immediate welfare gain of relief from physical suffering. Furthermore, in most societies providing health and education for the poor commands a degree of political assent that is altogether lacking for transfers of income or of assets such as land. Investing in the health of the poor is an economically efficient and politically acceptable strategy for reducing poverty and alleviating its consequences, as World Development Report 1990 emphasized.

If "the poor" are all those living on less than $1 (in real purchasing power) per day, they can typically neither afford much health care nor borrow to pay for it. Simply transferring small amounts of income to poor people would create relatively little additional demand for health care. But because the poor are more sensitive to the price of medical care and also suffer a greater burden of disease than the nonpoor, access to free or low-cost care can produce large increases in their consumption of health care.

To ensure that subsidized health services actually reach the poor, however, may require restrictions, particularly on the kind of care that is paid for by the public sector. Offering free care of all kinds to everybody typically leads to rationing of services—geographically or according to quality. Such universal programs may not reach the poor or improve their health. They may, however, command more political support than targeting, and they more easily address the problems of insurance markets that are discussed below. Who should receive free care depends on the prevalence of poverty and on the country's capacity to finance care: spending more can translate into more services for the poorest or the same services for more people, including the less poor. In practice, very poor countries must target if they are to offer the poor any meaningful health care.

Public goods and externalities are forms of market failure that may justify government intervention. The key characteristic of public goods—which may be products or services—is that one individual can use them or benefit from them without limiting others' consumption or benefit. As long as somebody pays, everybody benefits—which makes it difficult or impossible to find anybody altruistic enough to pay. Many public health interventions, such as wide-area control of disease vectors and radio-based health information campaigns, are nearly pure public goods for which only the government can ensure provision. Another public good, new scientific information, has contributed enormously to the rapid improvements in health during this century. Its continued creation will depend at least in part on governments. The right choice of interventions and the proper level of provision of any public good require careful analysis of the health benefits in relation to the costs. Prices provide no indication of what benefits are worth because private markets do not supply public goods. Nonprofit nongovernmental organizations (NGOs) may supply such goods but cannot fully substitute for government action.

Externalities, or spillovers of benefits or losses from one individual to another, characterize cases in which a private market might function but would produce too much or too little. For example, curing an individual of tuberculosis also prevents transmission of the disease. But an individual’s demand to be cured of tuberculosis (or of mild or asymptomatic sexually transmitted disease) is probably not affected by consideration of the risk to others. If the externality is not taken into account, treatment will be priced too high in private markets, and too little treatment will be given. Subsidies for treatment are therefore justified. An example of negative externalities is a person’s use of antibiotics, which may, by increasing microbial resistance to a drug, reduce the drug’s value to others and increase their risks.

Failures in markets for health care and health insurance provide a third rationale for government action to improve efficiency and, in the case of failures in the market for health insurance, to improve equity. One source of market failure, "adverse selection," arises because individuals face different risks. Customers who know themselves to be at
high risk are motivated to buy more insurance and are more likely to use it. So it is in the insurer’s interest to find out who the high-risk customers are and either to exclude them or to compensate for their greater risk by charging them higher premiums. (Higher prices for all customers would reduce demand by low-risk people and therefore push prices still higher.) Defensive efforts to obtain valuable information about risks add to the cost of insured health care without improving health outcomes.

Adverse selection presents a serious problem for risks existing at the time insurance is taken out, but an even more complex problem arises from the fact that an initially low-risk person may become high-risk later in life. In principle, there should be insurance available specifically against this likelihood of increased risk, or else insurance should cover a person’s entire lifetime, with sharing of risks that may arise in the distant future, as well as of current ones. Neither solution is easy to implement because of the extreme uncertainty; insurance can cover known risks but not uncertainty about risks.

Another problem is the tendency of consumers to use more of a service when its marginal cost to them decreases. Insurance reduces or eliminates the marginal cost of health care to consumers. So, providing insurance does not simply shift the way a given amount of health care is paid for but increases the amount of care demanded.

Because the financial cost of disease is reduced, people may take less care of their health, leading to more illness and more subsequent demand for care. Or they may protect their health more by way of health care, paid for by insurance, and less through their own behavior. Passing costs on to others such as insurers because one does not bear the full consequences of one’s actions is called “moral hazard.” It arises because of uncertainty and because insurers cannot fully monitor consumers’ behavior and make them responsible for their decisions. Moral hazard also results when providers induce demand for services that neither they nor consumers will pay for.

Both adverse selection and moral hazard have more pernicious effects in markets for health insurance than in markets for insurance on houses or cars. Risks to houses are higher in areas prone to earthquakes or hurricanes, but they are easy to determine, and insurers respond by charging higher premiums in those areas. Similarly, car insurance premiums are higher for young drivers and other identifiable groups at greater risk of vehicular accidents.

There is some moral hazard in the markets for house and vehicle insurance. The extreme form is when somebody burns down a house to collect the insurance or abandons a car and reports it as stolen. But unlike consumption of too much health care, these actions are crimes, with penalties that may greatly exceed the value of the asset. In any case, the insurer’s potential liability is limited to the (easily determined) market value of the asset.

All the limitations on moral hazard and adverse selection are weaker in health insurance. It is harder to identify individual risks, and still harder to attribute them to behavioral choices. There is no market value for the human body and no possibility of abandoning one that is worn out and acquiring a new one. The lack of a natural limit on costs (since the asset being insured, the body, has no price with which costs can be compared) distinguishes health from other insurable risks.

The difficulties in insurance markets carry over directly into markets for health care. If people have “too much” health insurance, they will have an incentive to use “too much” health care at too high prices. Unfortunately the difficulty of judging health care risks and the impossibility of placing a value on a living body make it impossible to determine how much is “too much” in health care and health insurance. Nor is making a consumer pay more for health care a sure way of reducing only “unnecessary” demand.

Failures of information make matters even worse. A patient who knew the likely outcome and the cost to him or her of every possible treatment might yet be able to choose rationally between gains and costs. But patients do not have such knowledge, and the medical professional generally knows far more than the customer. This asymmetry of information means that the provider not only provides services but also decides what services should be provided. The result is a potential conflict of interest between what the provider stands to gain from selling more services and his or her duty to do what is best for the patient. The patient is at even more of a disadvantage when sick and unable to make decisions or when decisions must be made quickly because of threats to life.

The same potential for consumption of unnecessary services can arise any time a supplier is better informed than a customer. It is a notorious problem in car repair and home improvement services. But in these sectors the insurer has more opportunity to supervise the service provider, and the insurer may decide simply to replace the item rather than to repair it. Health insurers have no
replacement option. They may try to review professionals’ recommendations before agreeing to pay for services, but health professionals often disagree about expected medical outcomes, and waiting for a second opinion may cause pain, suffering, and increased risk for the patient.

These problems constitute the market failure peculiar to health: expenditure on medical care can be extremely high, yet not all justified care is provided and much care of doubtful value is paid for. Some people are denied insurance, while others may be overprotected. Those who do not pay the full costs of treatment may take poorer care of their own health than they could. Many of the extra costs are paid by society as a whole.

The market for health care goods and services can also fail through imperfect competition among providers, which allows excess profits, inefficient use of resources, poor quality, and too little production. Sometimes governments themselves artificially stifle competition. For example, governments may prohibit or interfere unduly with the operation of private health care providers, particularly NGOs. Governments often also protect domestic producers of drugs and vaccines. In Bangladesh tetanus vaccine produced domestically at government insistence had such low potency that its use in 1989–92 risked thousands of lives before it was replaced with imported vaccine.

*Economies of scale* in production—which occur when a single large producer is much more efficient than many small ones—also lead to noncompetitive situations. In many parts of the world hospitals and specialists face little or no competition because of economies resulting from large-scale operation. Such situations may call for regulation of the private market.

The three rationales for government intervention in the health sector—provision of public goods, reduction of poverty, and market failure—correspond roughly to three different kinds of services. First, the services classified as public goods, and some of those characterized by large externalities, constitute what is known as “public health.” Public health includes those services provided to the population at large or to the environment, such as spraying to control malaria. It also typically includes some services such as immunizations that are not public goods but that carry substantial externalities.

Second, the inclusion of health care as part of a strategy for combating poverty justifies public financing of “essential” clinical or individual services. These are highly cost-effective services that would greatly improve the health of the poor. Since poor people typically cannot buy such care for themselves, there is a straightforward case for public finance. Public health measures and essential clinical care together constitute a package of health care that might justifiably be financed by general revenues, with perhaps some contribution from user fees. This strategy is also compatible with the argument that basic health care is a fundamental right. Although most of the population may be able to pay for such care, the government has a responsibility to ensure that the poor, too, can exercise their right—at least to the extent that society can afford.

Third, the rationale that the government should intervene in health care markets because of significant market failures applies particularly to the regulation of health care and health insurance. The government cannot finance all medical care for which insurance might be desirable without worsening the tendency toward higher costs and risking de facto rationing of health care, which particularly hurts the poor. Beyond a well-defined package of essential services, therefore, the role of the government in clinical services should be limited to improving the capacity of insurance and health care markets to provide discretionary care—whether through private or through social insurance (earmarked taxes such as social security or other mandated arrangements). Of course, the range of services included in the nationally defined essential package will vary substantially from country to country. To provide equitable access for the poor, to address problems of adverse selection, and to contain costs, the governments of almost all OECD countries have made available a comprehensive essential package with public (or publicly mandated) financing. Poorer countries must, of necessity, define their essential packages more narrowly.

Governments can further improve how markets function by providing information about the cost, quality, and outcome of health care. Simply by defining an essential clinical package, the public sector provides valuable guidance on what is and what is not cost-effective. This distinction may then influence the design of private or social insurance packages and the behavior of individual providers or patients. Information on the relative cost-effectiveness of different discretionary procedures is similarly valuable and might be used by insurers and providers to reduce costs and attract clients.

Neither theory nor experience points to a general rule on the extent to which the public sector should provide health care directly, as distinct from financing it. Governments might have to
supplies a package of essential health services directly where private care would not be feasible without high subsidies—for example, in lightly populated, very poor areas. (In many parts of the developing world an alternative method of providing such services is to subsidize an NGO.) In most circumstances, however, the primary objective of public policy should be to promote competition among providers—including between the public and private sectors (when there are public providers), as well as among private providers, whether nonprofit or for-profit. Competition should increase consumer choice and satisfaction and drive down costs by increasing efficiency. Government supply in a competitive setting may improve quality or control costs, but noncompetitive public provision of health services is likely to be inefficient or of poor quality.

In some circumstances market failure may impose only slight welfare losses, and the benefit of correcting it may be outweighed by the costs of government action. In other cases the losses from failure to take account of positive externalities and supplier-induced demand can be enormous. Policy toward tuberculosis control in China provides an example: elimination of some free health care and introduction of profit incentives in the provision of health services dramatically reduced treatment rates, reversing progress against the disease and causing much needless suffering (Box 3.1).

**Failures of government intervention** can arise, however, even when government action might be sound policy.

- Governments may misjudge how an intervention will work in practice. Governments have only partial control over how private actors respond,
and those responses can undermine the intended objective. Since 1971 physicians' fees in all provinces of Canada have been set by negotiation with provincial governments, and fees are no longer rising faster than the general price level. To protect their incomes, particularly during the inflationary period 1971-75, physicians carried out a greater number of procedures. This reaction was strongest where real fees fell the most. The saving in government expenditure was therefore much less than had been anticipated.

- Governments may not have the capacity to administer or implement policies well. Indeed, they may suffer from corruption and from sheer incompetence. The examples of two donor-financed public hospitals, each with 500 to 600 beds, in two Latin American countries illustrate the problem. One was simply too large to administer and operate and therefore could not be used at more than 60 percent of capacity. The other was so badly designed that it could not accommodate more than one-third the planned number of patients.

- Governments are vulnerable to special interests both within and outside the health system. By financing the training of unneeded physicians, by paying for low-value discretionary services for better-off patients, and by protecting domestic industries, governments help create the interests that later impede good policy, especially when quick responses are needed to meet changing circumstances or new opportunities. Even when society as a whole would gain, public action may fail because it does not overcome the resistance of those who would lose as a result.

Perhaps the most fundamental problem facing governments is simply how to make choices about health care. Too often, government policy has concentrated on providing as much health care as possible to as many people as possible, with too little attention to other issues. If governments are to finance a package of public health measures and clinical services, there must be a way to choose which services belong in the package and which will be left out. (The next section describes a measure of cost-effectiveness for health interventions that helps with this choice.) If financing is public but provision is private, governments must decide how to subsidize private care. The question of incentives to providers raised by that issue also applies to paying for publicly provided care—to the "internal market" in the public sector. And if governments are to influence the market for discretionary services, they must decide what instruments are most appropriate for affecting the behavior of insurers, providers, and patients. This raises the question of how far the government should itself act as an insurer, through social insurance, and how far it should regulate private insurers. Each of these decisions involves tradeoffs among the objectives of health policy: better health outcomes, lower costs, more equity, and greater consumer satisfaction with the health system as a whole and with individual care.

**Value for money in health**

No matter how health services are organized and paid for, what they actually provide are health interventions: specific activities meant to reduce disease risks, treat illness, or palliate the consequences of disease and disability. Debates about whether health services should concentrate on "vulnerable groups" such as children, pregnant women, or the elderly, or about the relative roles of hospitals versus health centers, or about preventive versus curative activities, are at bottom debates concerning the proper mixture of interventions. In health, as in every other sector, customers want value for the money spent on such interventions—whether they pay directly or indirectly, in their roles as taxpayers or as buyers of health insurance.

Knowing the cost-effectiveness of a health intervention—the net gain in health (compared with doing nothing) divided by the cost—can be extremely useful for both public and private decisions. Governments can generate such information, and they can use it in two ways. First, they can use it in determining whether a particular public sector intervention is cost-effective: this means judging the improvement in health compared with what would have happened through private decisions in the absence of public action. (Chapter 4 addresses these issues for public health measures and Chapter 5 for the public finance of essential clinical services.) Second, they can supply information about the outcomes and costs of different health interventions to consumers, providers, and insurers, and this knowledge can increase the value per health dollar spent in the private sector, including what is spent on discretionary services. Private providers have no more incentive than public providers to measure health outcomes, but they do face greater incentives to know their costs. Cost information alone can promote allocative efficiency, as the experience of a Brazilian nonprofit maternal and child hospital demonstrates (Box
Box 3.2  Cost information and management decisions in a Brazilian hospital

The Instituto Materno-Infantil de Pernambuco (IMIP) is a private, nonprofit hospital founded in 1960 to serve the metropolitan area of Recife. In 1992 it received the first UNICEF award to a "child-friendly" hospital in Brazil in recognition of its work, particularly in the promotion of breastfeeding. IMIP depends for 95 percent of its revenue on contracts from the Instituto Nacional de Assistência Médica e Previdência Social (INAMPS) of Brazil’s Ministry of Health. Annual spending runs about $6 million.

Starting in 1989, IMIP organized an accounting system that divides services according to eleven cost centers for final output. Administrative, laundry, food, radiology, laboratory, transport, and other nonfinal services were assigned to these final outputs in proportion to their measured or estimated use.

IMIP must match its average costs to average revenues determined by the price schedule of INAMPS, which is organized by treatment groups rather than by individual services. Losses in any cost center must be offset by surpluses elsewhere. Gravely ill children are referred to the hospital from all over northeast Brazil, and there are three infant deaths per day among them. To reduce mortality, IMIP created a pediatric intensive care unit. The treatments provided, however, cost much more than INAMPS would pay. And mortality did not decline. Even without cost-effectiveness calculations, it was evident that closing the intensive care unit (except for newborns) and strengthening other services would save a greater number of children’s lives. In particular, since the children who died in the hospital typically arrived very sick and often severely malnourished, it appeared more cost-effective to try to find high-risk children and treat them earlier. The strategy used was to expand the network of small community health posts in the slum neighborhoods of Recife. IMIP opened the first such posts in 1983; by 1986 infant mortality in those neighborhoods had fallen from 147 to 101 per 1,000 births.

The experience of IMIP illustrates three lessons about cost-effective delivery of essential care. One is that allocative efficiency can be improved without complete information: medical professionals know much about outcomes and often need only to know more about costs. A second lesson is that autonomy facilitates such changes: since private facilities generally have much more autonomy than public ones, this is an argument for more public finance of private provision or for decentralization of public systems. The third lesson is that even prices that are not based on cost-effectiveness criteria can guide decisions about what care to provide. It is more useful for government to set those prices correctly than to try to make all the allocative choices.

3.2). By estimating costs for "cost centers" and relating them to outputs, the hospital discovered that its pediatric intensive care unit would drain resources from other departments, given the prices the government paid for various services. The decision was made to limit the intensive care unit to newborns; community-level health posts appeared more cost-effective for other cases.

Measuring the cost-effectiveness of health interventions

Given a common currency for measuring cost and a unit for measuring health effects, different interventions can be compared by what it costs to achieve one additional year of healthy life. Outcomes are measured in the same unit of disability-adjusted life years (DALYs) used to estimate the burden of disease. Nonhealth burdens, such as income lost because of disease, are not included in the measure. The ratio of cost and effect, or the unit cost of a DALY, is called the cost-effectiveness of the intervention; the lower that number, the greater the value for money offered by the intervention. This approach avoids assigning a dollar value to human life, as would be necessary if costs and gains were to be put in the same units.

Only in the past decade have costs and effectiveness been systematically estimated for a wide range of health care interventions—although the first such calculations had been made many years earlier. Only a small share of the thousands of known medical procedures has been analyzed, but the approximately fifty studied would be able to deal with more than half the world’s disease burden. Just implementing the twenty most cost-effective interventions could eliminate more than 40 percent of the total burden and fully three-quarters of the health loss among children.

The cost and effectiveness estimates used in this Report are based, as far as possible, on actual conditions in developing countries. Some fixed costs of operating a health system that cannot be attributed to particular interventions are not considered, but the costs of intervention-specific capacity are taken into account. Costs are assessed at market prices. For inputs that cannot be traded internationally (such as semiskilled labor), costs will be lower in developing countries. For drugs, most
equipment, and high-level manpower, costs are likely to be equal across countries, leaving aside the effects of tariffs or other barriers. Indirect costs, such as patients’ costs of travel to treatment or the income they forgo, can be substantial for some interventions and perhaps particularly for women. Because these costs are difficult to determine, they were largely ignored; more study is needed of how these barriers affect the utilization of health services.

For some common health service packages such as immunizations, costs are computed on a joint basis rather than separately for each intervention in the package. The estimates do not represent an unattainable ideal; they assume that medically correct procedures are followed and that reasonable care is taken as to quality, but they also allow for incomplete coverage or compliance. Whenever possible, actual experience is used to guide estimates of such things as how many patients will fail to complete a course of treatment. Future gains from current interventions are discounted at 3 percent per year, which has little effect on the ranking of interventions the effects of which are felt quickly, although it does reduce measured gains from interventions when the health effects are felt only in the long run.

This Report found huge differences in both the cost and the effectiveness of various health interventions. Figure 3.2 presents both dollar costs and gains in DALYs for each of forty-seven different interventions. Higher points represent interventions that are more effective in improving health; points farther to the right represent lower-cost interventions. Some interventions cost more than $10,000 per person benefited, while others cost less than $1. Some interventions add more than ten years of healthy life; for others the gain is equivalent to only a few hours or days of full health. Both axes are scaled in logarithms so that the diagonal lines show equal cost-effectiveness ratios in dollars per DALY. These ratios vary widely, from as little as $1 to as much as $10,000. Higher lines represent more cost-effective interventions. Four specific interventions illustrate extreme combinations of cost and health gain: vitamin A supplementation in areas where the risk of blindness from vitamin deficiency is high (very low cost, high gain), chemotherapy for tuberculosis (high cost, very high gain), environmental control of dengue (low cost, low gain), and treatment of childhood leukemia (very high cost, moderately high gain).

Because interventions can differ so much in cost-effectiveness, making allocative decisions badly in either the public or the private sector costs lives. An expenditure of $100,000 on chemotherapy for tuberculosis could directly save about 500 patients. It would also prevent them from infecting others, for a total gain of about 35,000 DALYs. The same expenditure on management of diabetes would also benefit 500 patients but would save only 400 DALYs; each patient would gain less than one healthy year from a year of treatment, and there would be no benefit from reducing incidence. Insisting on value for money is not only fully consistent with compassion for the victims of disease, it is the only way to avert needless suffering.

The results of cost-effectiveness analysis confirm the value of the primary health care interventions included in programs to reduce childhood malnutrition and mortality, chiefly from infectious diseases. Several hitherto neglected interventions are also very cost-effective: chemotherapy against tuberculosis, integrated prenatal and delivery care, mass programs to deworm children, provision of condoms along with information and education to combat AIDS, and measures against smoking, such as education, consumer taxes on tobacco products (an effective deterrent for adolescents who are not yet addicted), and prohibition of smoking in public places. Many of the most cost-effective health interventions are preventive in character. But not all preventive measures are cost-effective: spraying to control the mosquitoes that carry dengue is an example of relatively poor value for money. At the same time, a small number of neglected but cost-effective clinical (mostly curative) interventions could eliminate a substantial fraction of the burden of disease in many countries.

In general, most cost-effective interventions can be performed outside hospitals. By treating a small number of severe cases of disease, however, hospitals can sometimes improve health at a lower cost per DALY than lower-level facilities—provided that clinics or health posts treat most cases and refer to hospitals only those requiring more sophisticated care.

Complications in the use of cost-effectiveness

Both the cost and the effectiveness of an intervention can be affected by the incidence and prevalence of the disease and the probability of dying from it. Preventive interventions are less cost-effective for relatively rare diseases because more people have to be reached to prevent one case. The fatality rate matters because preventing or controlling a disease saves more lives if there is a high
probability of dying. Immunization in an environment in which children are undernourished and many die from preventable diseases is more cost-effective than if children are otherwise healthy and face little risk of dying. (Box 3.3, on measles and tuberculosis, illustrates these issues.) Fortunately, differences in cost-effectiveness between one intervention and another are often much larger than either the variation from one locale to another or the uncertainty in the estimates. Where this is not the case, as exemplified by malaria, detailed local information is needed to judge which interventions should have priority. National or regional assessments are also important for estimating the expenditure levels required and the probable impact on the national burden of disease.

If providing an intervention did not impose any fixed costs in infrastructure and program administration, then a low cost per DALY saved would suffice to justify the intervention. In practice, there may be substantial fixed costs to share over a number of interventions, and administrative capacity
The costs and effects of measles vaccination were estimated for a model urban area based on data from Lagos and Kinshasa. Data from Matlab, Bangladesh, were used to model measles in rural areas. In each area, 36,400 cases of measles were assumed to occur in the absence of vaccination, with 1,452 urban deaths and 806 rural deaths. All the health damage from measles comes from deaths, each of which costs thirty DALYs. The simulations considered three different strategies: no vaccination, immunization at nine months (the earliest age at which the standard vaccine is effective) with 60 percent coverage, and nine-month vaccination plus efforts to increase coverage to 80 percent, which raises supervision costs by 10 percent. For the last strategy, incremental as well as average costs were calculated to highlight the effect of raising coverage. Costs were related to each of three effects: cases averted, deaths averted, and DALYs gained. Box 3.3 shows the results.

Measles strikes later in childhood in rural areas, so cases are easier to prevent. But because earlier cases (in urban areas) cause more deaths, the cost per death averted or per DALY is higher. In both urban and rural areas, the marginal cost of raising coverage exceeds the average cost of the lower-coverage strategy, but the higher-coverage approach continues to be extremely cost-effective. Similar calculations were made for chemotherapy for tuberculosis, for both a standard course of treatment (twelve to eighteen months) and a short course (six to eight months), each with and without hospitalization. Using data from Malawi, Mozambique, and Tanzania, the average incremental cost (marginal cost plus the average cost attributable to the fixed costs of the tuberculosis control program but excluding other fixed costs of the health system) was estimated at about $80 to $110 per cure for ambulatory treatment, and $160 to $300 when hospitalization was required. Cost per death directly averted was in the range of $75 to $275, but cost per total death averted, taking account of the interruption of transmission, can be as low as $20 and never exceeds $100. These very low costs translate into costs per DALY saved of about $1 to $5, making chemotherapy for tuberculosis one of the most cost-effective of all interventions. These costs do not vary with the annual rate of infection. The cost-effectiveness of BCG vaccine, by contrast, is extremely sensitive to infection rates; the vaccine is cost-effective only when the risk of infection is high.

### Box 3.3 Health costs and gains from measles immunization

<table>
<thead>
<tr>
<th>Item</th>
<th>Urban, by percentage vaccinated</th>
<th>Rural, by percentage vaccinated</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>60</td>
<td>80</td>
</tr>
<tr>
<td>Cases prevented (thousands)</td>
<td>10.7</td>
<td>14.2</td>
</tr>
<tr>
<td>Total cost per case prevented (dollars)</td>
<td>17</td>
<td>18</td>
</tr>
<tr>
<td>Incremental cost (dollars)</td>
<td>—</td>
<td>22</td>
</tr>
<tr>
<td>Deaths averted (thousands)</td>
<td>0.4</td>
<td>0.6</td>
</tr>
<tr>
<td>Total cost per death averted (dollars)</td>
<td>432</td>
<td>462</td>
</tr>
<tr>
<td>Incremental cost (dollars)</td>
<td>—</td>
<td>552</td>
</tr>
<tr>
<td>DALYs gained (thousands)</td>
<td>12.3</td>
<td>16.4</td>
</tr>
<tr>
<td>Total cost per DALY (dollars)</td>
<td>15</td>
<td>16</td>
</tr>
<tr>
<td>Incremental cost (dollars)</td>
<td>—</td>
<td>19</td>
</tr>
</tbody>
</table>

*Source:* Foster, McFarland, and John forthcoming.

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may be limited. Spending on interventions that are very cost-effective but resolve very small disease burdens could waste resources by making it difficult to deal with diseases that impose much larger burdens. Priority should go to those health problems that cause a large disease burden and for which cost-effective interventions are available (Box 3.4). If a particular health problem causes the loss of many healthy life years but there are no means—or only very costly means—for dealing with it, then it should be a priority not for health care but for research on development of cost-effective interventions.

Since only relative ranking is possible, the attractiveness of an intervention also varies according to what other health problems and treatments are locally prevalent. Oral rehydration therapy is an example: in environments in which child mortality is low, it is much less cost-effective than immunization because it may have to be given repeatedly during a child’s first few years, but as mortality rises it becomes more cost-effective. In general, the cost-effectiveness ratio varies not only with local conditions but also with the degree to which an intervention penetrates or covers a population. Cost-effectiveness is also influenced...
by the presence of other interventions that might affect costs (through sharing of joint costs) or outcomes. Sometimes combining two interventions, one preventive and one curative, is the appropriate way to deal with a particular disease, as is the case for tuberculosis and malaria. Some treatment for malaria is necessary because preventive measures do not protect everyone; even if treatment is more costly, both interventions should be applied.

In exceptional circumstances it may be worth paying high marginal costs to extend coverage of an intervention to the entire population because the disease can be eradicated permanently (as has occurred with smallpox and may now be possible with polio). The gains in such cases include not only the DALYs saved at the margin from the last people immunized but all the healthy years that would otherwise be lost to the disease in the future. A similar argument holds if a low-cost intervention that has to be applied continually is replaced by one with large initial costs but permanent effects, such as sanitation to reduce the need for treating many fecally borne diseases.

An important limitation on the use of cost-effectiveness analysis of resource allocation in health is that a number of interventions with important health consequences also affect income or welfare in other ways. Chemotherapy for tuberculosis has no value beyond the DALY gain associated with curing tuberculosis, but investing in girls’ schooling has both important consequences for health (as documented in Chapter 2) and for income and status later in life. Similarly, family planning, in addition to its health benefits, permits family choice about the number and spacing of children; improved water supply and sanitation create amenity and time-saving benefits; increased food consumption allows higher levels of physical activity; and improved road safety reduces property damage and saves lives. For some of these interventions (for example, family planning and girls’ schooling) the cost per DALY is sufficiently low to make them attractive on health grounds alone; other benefits only strengthen the case. For other interventions the cost per DALY gained may be too high to justify investment on health grounds.

**Box 3.4  Priority health problems: high disease burdens and cost-effective interventions**

It is easy to determine which health problems among children under age 5 deserve priority. As Appendix table B.6 shows, nine diseases each account for more than 1 percent of the total disease burden in this age group. These diseases range from acute respiratory infections (more than 17 percent in both boys and girls) to iodine deficiency (1.2 to 1.3 percent). Of these problems, which cause fully 80 percent of young children’s ill health, eight can be addressed by interventions costing less than $100 per DALY saved. The only exception is congenital problems, which are responsible for more than 6 percent of the disease burden but for which no cost-effective interventions are known.

The situation is much more complicated for adults (Appendix table B.7). For example, cerebrovascular disease is the leading cause of healthy life years lost in both sexes after age 60 and in women ages 45-59, but interventions to deal with it cost $1,000 or more per DALY saved. Ischemic heart disease is the second or third leading cause of ill health in both sexes after age 45, but the cost per DALY of dealing with it is $250 to $1,000. Among the ten principal noncommunicable causes of ill health in this age group, interventions costing less than $100 per DALY saved exist only for cataracts, anemia, and cancers of the respiratory system (through reduction of smoking) and the cervix. These problems account for only 7.9 percent of the disease burden in women ages 45-59 and for smaller shares in other age and sex groups. Among communicable diseases tuberculosis, AIDS, and respiratory infections deserve priority, but they cause less than 10 percent of all ill health after age 45 and only 20.1 percent in men ages 15-44.

Large disease burdens and cost-effective interventions coincide for only one group of adults, women ages 15-44. Six of the ten main sources of ill health can be prevented or treated for less than $100 per DALY. These range from maternal health problems (18.0 percent of the burden) to respiratory infections and anemia (2.5 percent of the burden each) and account in total for 44 percent of ill health among women of reproductive age. Two other problems—depression and self-inflicted injury—each cause at least 3 percent of the disease burden, but dealing with them is much more problematic.

These calculations illustrate the chief problem a health care system faces as the population ages: the marginal cost of a year of healthy life gained rises sharply, leading to difficult choices between increased spending and lower health gains. However, many health problems of the elderly that cannot be fully resolved may be palliated at low cost. And much can be done at earlier ages to improve the health of future generations of old people.
alone, but consumer willingness to pay for non-health benefits means that costs to the health system can be low. Many water and sanitation investments are in this category.

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. The most justified public measures will therefore combine a strong rationale for public action with a cost-effective health intervention. Because individuals differ in how they value the present in relation to the future and in how they judge the seriousness of different health conditions, a uniform ceiling on what the government pays to gain one DALY may leave some people with more publicly financed care than they would choose and some with less. But of all possible uniform criteria by which to judge what interventions to pay for, cost-effectiveness appears to yield the most efficient distribution of health resources.

Data limitations

Cost-effectiveness analysis requires data on expenditures for particular interventions and on outcomes information that health facilities and systems, particularly those in the public sector, typically do not collect. Such information could promote substantial gains in efficiency, but it will take considerable time and effort for most public systems in developing countries to learn how to gather and use it. Budgets often disaggregate only by inputs, not by programs, and costs per consultation or per bed-day mix many different interventions. Outcomes are seldom quantified. For interventions the cost-effectiveness of which vary greatly with local conditions, there is no substitute for information on both costs and results.

Health policy and the performance of health systems

All governments subscribe to the view that the state must ensure the provision of certain basic public health services. But few achieve this goal— even for immunization, which is probably the health intervention that has received the greatest government attention and donor support and that has the most easily measured output. Coverage in many regions remains incomplete. Immunization against measles and against diphtheria, pertussis, and tetanus has reached 90 percent or more in Chile, China, Cuba, Korea, and Saudi Arabia, but it is still below 50 percent in some Asian and many Sub-Saharan African countries. Many of the other components of an adequate public health package scarcely exist.

As far as clinical services are concerned, the principal government failing in most countries is the attempt to provide everything to everybody, with no distinction between more and less essential care and more or less needy patients. For some health services provided by the public sector, the system of provision is so grossly inefficient that it is unlikely to be cost-effective no matter what interventions the system tries to provide. Such inefficiencies have been criticized so clearly and for so long that it is evident they will only be overcome by radical changes in the organization of health care—such as a shift in the government’s role from providing care to financing care and stimulating competition among providers. These changes will in turn require a clear distinction between essential and discretionary spending and a new determination by governments to achieve value for money in health services. There is no other equitable way to control government spending.

Most governments also perform poorly in regulating markets for private services, including insurance. As recent research in Brazil has shown, the quality of medical care could be substantially improved at low cost if government discharged this role better. The rapid growth and almost total lack of regulation of private insurance in such countries as Brazil and Korea present another challenge for which governments are ill-prepared.

Allocation of spending to cost-effective services

There are no calculations of how many years of healthy life are currently saved by health systems. Nonetheless, it is clear that many of them perform much worse than they might. Many governments spend too much on sophisticated hospital services of low cost-effectiveness and too little on essential public health and clinical services. The share of public expenditures for health absorbed by tertiary and secondary care hospitals, for example, is as high as 70 to 75 percent in Jordan and Venezuela. Tertiary care hospitals alone may consume 30 to 50 percent of the health budget. Only a quarter of government spending, and often less, is devoted
Table 3.2 Actual and proposed allocation of public expenditure on health in developing countries, 1990 (dollars per capita)

<table>
<thead>
<tr>
<th>Package component</th>
<th>Low-income countries&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Middle-income countries&lt;sup&gt;b&lt;/sup&gt;</th>
<th>All developing countries</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public health</td>
<td></td>
<td>4</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>Essential clinical services (minimum package)</td>
<td>8</td>
<td>15</td>
<td>10</td>
<td>4-6</td>
</tr>
<tr>
<td>Total, public health and minimum essential clinical services</td>
<td>12</td>
<td>22</td>
<td>15</td>
<td>5-7</td>
</tr>
<tr>
<td>Discretionary clinical services&lt;sup&gt;c&lt;/sup&gt;</td>
<td>-6</td>
<td>40</td>
<td>6</td>
<td>13-15</td>
</tr>
<tr>
<td>Total</td>
<td>6</td>
<td>62</td>
<td>21</td>
<td>21</td>
</tr>
</tbody>
</table>

Note: Current spending on essential clinical services is estimated to be 20-30 percent of total public expenditure on health on the basis of estimates in World Bank health sector reports. The numbers reported should be regarded as approximations.

<sup>a</sup> Estimated for an income level of $350 per capita.

<sup>b</sup> Estimated for an income level of $2,500 per capita.

<sup>c</sup> Estimated residually. The negative number for low-income countries reflects total spending below the cost of the package.


to cost-effective public health measures and essential clinical care, delivered mainly in health centers and communities. In many countries the share of public spending devoted to these basic services has been falling in recent years. In Brazil 64 percent of public spending on health in 1965 was for preventive and public health activities, but by the mid-1980s the share had dropped to 15 percent, and hospitals absorbed fully 70 percent of expenditure. The resulting weakness of the primary care network leads patients to seek care in hospitals: up to 80 percent of the cases crowding hospital emergency rooms could be treated as effectively, but more cheaply, at the primary level.

In the world as a whole, almost half the existing disease burden is from communicable diseases, nutritional disorders, and maternal and perinatal causes. It is primarily these problems that an appropriate package of cost-effective care would address. Even the best-designed care package could not prevent all the health damage from these diseases because of the low cost-effectiveness of some interventions and the increasing marginal costs of even the best ones. Still, because of the size of the burden and the low cost per DALY of the interventions, it is reasonable to conclude that public expenditure on health should initially be concentrated on those conditions. What this implies for the distribution of spending by type of input or level of facility is less clear, but it probably means that facilities above the district hospital level should account for only a small share of the total, primarily for dealing with referrals.

Table 3.2 illustrates the degree of misallocation of health spending by comparing estimated actual expenditure with what would be spent for a pack-
age of health services designed to address most effectively the burden of disease in the developing world. This package consists of public health services that would cost just over $4 per capita in poor countries (with average income per capita of $350) and a minimum package of essential clinical services that would cost about $8 per capita more. In middle-income countries (with average income per capita of $2,500), the same package of public health measures and essential clinical services would cost about 80 percent more, or $22 per person. This difference partly reflects different epidemiological conditions, but input costs, particularly salaries, would also be higher in middle-income countries. Many countries will define the essential clinical package much more broadly than the minimum discussed here. Even in relatively poor countries, targeting public finance of essential services to the poor would allow creation of a broader and more generous package. Such a package can be built up by adding interventions in order of decreasing cost-effectiveness until the additional health gain is judged not to be worth the cost, given the country’s resources. To ensure political support and to deal with problems of market failure and equity, countries may choose to finance the essential package universally from public, or publicly mandated, sources.

Governments in developing countries spend an estimated $21 per capita on health, for a total of about $84 billion. It is estimated that only a little more than $1 per person, or a total of $5 billion, goes for cost-effective public health measures. To buy the package described here, countries would need almost to quintuple what they spend on public health. About $4 to $6 per capita, or $17 billion to $25 billion total, goes for clinical services delivered through lower-level facilities or classified as primary health care. These services commonly include many of those in the essential clinical care package, but they are usually not delivered to the entire population. And this expenditure includes some less cost-effective services that should be regarded as discretionary. Paying for a minimum package of essential clinical care would require expenditure of an additional $16 billion to $24 billion, doubling the current expenditure level. If total spending did not change, this would imply a reduction by about half in what is now spent on discretionary services.

For some countries, paying for the proposed package of services poses a severe challenge. In fact, in the poorest countries total current public spending of $6 per person is about $6 short of the cost of the package. Total per capita spending, including private spending, is about $14, about the same as the proposed package. This means that either substantial private resources will have to be used or additional government resources will be needed; even if all public expenditure on discretionary services were eliminated, current government spending on health would not meet the costs of the package.

Since the minimum package would cost only about $60 billion for all developing countries together, the task is to reallocate resources in middle-income countries and to find additional resources of about $10 billion in low-income countries. The $8 to $10 per capita needed in extra spending on public health measures and essential clinical services is less than the $13 to $15 per capita now spent, on average, on discretionary or nonessential clinical services. In fact, spending on these less cost-effective services is now roughly double the amount that countries spend on the recommended package of public health measures and essential clinical care. The right combination of reallocation and additional expenditure would allow governments to achieve a large improvement in overall health.

Table 3.3 indicates how large this gain could be. Properly allocated, an expenditure of only $12 per person in low-income countries (excluding China) would be enough to reduce the disease burden by almost one-third. This is 226 million DALYs, equivalent to 7.0 million infant deaths per year. In middle-income countries the proposed package could deal with only 15 percent of the disease burden, despite the higher expenditure per person. The total reduction in ill health in middle-income countries would be about 45 million DALYs, the equivalent of 1.4 million infant deaths per year. The smaller gain in these countries reflects the fact that they have already eliminated much of the burden from easily controlled communicable diseases. A large part of the remaining burden is caused by chronic disease and disability.

It is assumed that the disease burden would decline by the same share in China as in a middle-income country because China has already substantially reduced the burden from the diseases addressed by the package. About 30 million DALYs could be gained, the equivalent of 930,000 infant deaths prevented. The cost per capita would be the same as in low-income countries.

Full coverage with the minimum package would cost an estimated $22 billion in low-income countries, $14 billion in China, and $26 billion in middle-income countries. The total cost would be about $62 billion, or $15 per person in the develop-
The gain in health would be about 300 million DALYs, which is equivalent to 9.3 million infant deaths. Universal application of the package would therefore yield about the same health gain as eliminating nearly all the infant deaths in the world today. These gains could be achieved for an average cost of about $50 per DALY for the public health measures and about $100 per DALY for the minimum package of essential clinical services. The cost per DALY of the interventions in the package ranges from less than $5 to more than $200; average costs also reflect those public health measures that do not improve health directly but that are essential to the functioning of a health system.

In both low-income and middle-income countries the marginal cost per DALY would be less than the average cost because all the fixed costs of infrastructure are included in these estimates and there would be spare capacity for producing small additional amounts of most services. Because of joint costs, it is difficult to separate the cost per DALY for every intervention in the package.

In middle-income countries the package could be entirely financed by reallocating current public spending. In poor countries there would be a shortfall of about $10 billion a year, which could be covered by a combination of greater public spending, increased donor contributions, and more private expenditure by those able to pay. Shifting some part of the cost to higher-income consumers—for example, through private or social insurance—would allow for an expansion of the package or a reduced burden of public expenditure.

There are several reasons why developing countries fail to allocate sufficient resources to cost-effective health interventions. Health providers often lack incentives to provide cost-effective services. Doctors' pay, promotion, and professional recognition are enhanced by specialization and by the use of expensive new medical technology—not by serving as public health doctors or district medical officers in poor rural areas. Badly designed government salary schedules and price systems may exacerbate this trend. In China hospitals currently have a strong incentive to use new diagnostic and therapeutic technologies, for which full costs can be charged, instead of older and less expensive technologies for which government-set prices are far below actual costs.

Consumer demand for cost-effective services is often weak. This may reflect lack of information. In rural Africa, for example, goiter and impaired mental abilities from iodine deficiency have in many places become accepted as the normal state of affairs. Low demand may also reflect deficiencies in supply. Most cost-effective interventions can be delivered at primary care sites, but in poor

<table>
<thead>
<tr>
<th>Country group and package component</th>
<th>Cost per capita (dollars)</th>
<th>Total cost (billions of dollars)</th>
<th>Reduction in disease burden</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Percent   Millions of DALYs</td>
</tr>
<tr>
<td>Low-income countriesa</td>
<td>12</td>
<td>22</td>
<td>32         226</td>
</tr>
<tr>
<td>Public health</td>
<td>4</td>
<td>8</td>
<td>8          57</td>
</tr>
<tr>
<td>Essential clinical services</td>
<td>8</td>
<td>14</td>
<td>24         170</td>
</tr>
<tr>
<td>Chinaab</td>
<td>12</td>
<td>14</td>
<td>15         30</td>
</tr>
<tr>
<td>Public health</td>
<td>4</td>
<td>5</td>
<td>4          8</td>
</tr>
<tr>
<td>Essential clinical services</td>
<td>8</td>
<td>9</td>
<td>11         22</td>
</tr>
<tr>
<td>Middle-income countriesc</td>
<td>22</td>
<td>26</td>
<td>15         45</td>
</tr>
<tr>
<td>Public health</td>
<td>7</td>
<td>8</td>
<td>4          12</td>
</tr>
<tr>
<td>Essential clinical services</td>
<td>15</td>
<td>18</td>
<td>11         33</td>
</tr>
<tr>
<td>All developing countries</td>
<td>15</td>
<td>62</td>
<td>25         301</td>
</tr>
<tr>
<td>Public health</td>
<td>5</td>
<td>21</td>
<td>6          77</td>
</tr>
<tr>
<td>Essential clinical services</td>
<td>10</td>
<td>41</td>
<td>19         225</td>
</tr>
</tbody>
</table>

a. Estimated from data for Bangladesh, Egypt, India, Indonesia, Pakistan, and Sub-Saharan Africa.
b. China is shown separately because its cost per capita is assumed to be that of a low-income country but its percentage reduction in disease burden is assumed to be that of a middle-income country.
c. Estimated from data for Latin America and the Caribbean, Other Asia and islands except for Indonesia and Bangladesh, and the Middle Eastern crescent except for Egypt and Pakistan.

countries such as Burkina Faso and Mali, more than half of the population lives more than 10 kilometers from the nearest primary care center.

At a more fundamental level, the distribution of political power explains much of the misallocation of government resources for health. The urban population is better organized than rural groups and more vocal in demanding health facilities and services. Similarly, middle-class workers in wage employment, who frequently belong to powerful trade unions, are more effective than self-employed farmers and workers in the informal sector in lobbying for government-subsidized health benefits. Health professionals are also often better organized than the population they serve, and in promoting their own interests they may make the health system less efficient. Despite these problems, many countries have succeeded in dramatically improving the health of their people. This success can be accelerated, as newly available information makes it clear how costly misallocation is and how much health can be gained for relatively modest levels of spending.

**Equity in health status, utilization, and finance**

Data on health status, physical access to health services, consumption of health care, the distribution of the financial burden of health care spending, and public expenditures for health all tell the same story of severe inequities in developing countries. In Bangladesh, for example, the infant mortality rate for the urban poor (13.4 percent) is nearly twice the urban average (6.8 percent) and about 50 percent higher than the average rate for the entire country (10 percent). In China, despite remarkable overall progress in health (infant mortality fell from 20 percent in 1950 to 4.6 percent in 1982), there is considerable geographic variation, which is strongly related to income. Poor regions such as Yunnan, Xinjiang, and Tibet have infant mortality rates of more than 7 percent, compared with less than 2 percent in more affluent Beijing, Guangdong, Shanghai, and Tianjin. To take another example, in Kenya the probability of a child's dying before age 2 varied among ethnic groups from 7.4 to 19.7 percent, and in Cameroon these probabilities ranged from 11.6 to 20.5 percent.

The poor also have considerably worse access to health care. A number of surveys show that low-income households, especially in rural areas, have to travel considerably farther or longer to reach the first level of referral services, usually a primary health care center or doctor's office. In Indonesia in 1991, for example, rural households in the top income decile were three times more likely to live in a village with a health center than those in the bottom decile.

Partly because of difficulties in access, the poor in developing countries generally consume fewer health services. Household surveys from Sub-Saharan Africa and Latin America demonstrate clearly that among people who report themselves to be sick, those in urban areas seek and obtain medical care more often than those in rural areas, and the wealthy contact a care provider more often than do the poor. The differences can be large: in Côte d'Ivoire in the mid-1980s, for example, an urban household was nearly twice as likely to seek care as a rural household (60 versus 36 percent), and within the rural population a family in the top income quintile was almost twice as likely to seek care as a family in the bottom quintile (44 versus 23 percent).

A study of Peru showed similar inequalities among geographic regions and educational groups. There was little variation in self-declared illness, but the likelihood of obtaining medical care when sick was nearly three times higher in some parts of the country than in others. Regional differences in immunization rates were highest for uneducated mothers, whose children were only one-third as likely to be fully immunized as the children of women with secondary schooling. The 36 percent of all the self-declared sick who lived in the capital city accounted for 53 percent of all Ministry of Health ambulatory consultations, 41 percent of hospital admissions, and 47 percent of all public expenditure attributable to care for individual patients. At the other extreme was Piura, a poor mountainous region with 10 percent of the sick but only 4 percent of public spending and of consultations.

Inequity in public spending for health both accounts for and reflects marked inequalities in access to and utilization of care. In Indonesia, for example, despite significant investments in lower-level health facilities in the 1980s, only 12 percent of public spending for health in 1990 went for services consumed by the bottom 20 percent of households, while the top 20 percent obtained 29 percent of the government subsidy. This bias in favor of the wealthy was mainly a result of the distribution of government spending for hospital inpatient and ambulatory care, services that were used more frequently by the rich. Much more unequal situations can be found in many countries.
that concentrate government spending even more on high-level facilities.

The few countries in which public spending on health is biased toward the poor show that government policies can help reduce inequities in access and health status. In Malaysia the government has followed a pro-poor policy since the 1970s, with the lowest-income groups receiving a larger share of public subsidies for health than the middle class and the wealthy. Similarly, in Costa Rica government spending for health has continued to favor the poor, despite economic shocks and a major adjustment program in the 1980s that entailed cuts in public expenditure. In 1988 about 30 percent of government spending for health went to the poorest 20 percent of households and just over 10 percent of spending to the richest 20 percent. The poverty-oriented pattern of public spending for health in Costa Rica can be explained largely by the high degree of coverage by the social security health system (the entire population is covered in principle, even though only 63 percent of the working population contributes) and the relatively equal access to and quality of care enjoyed by all Costa Ricans. It also helps that the wealthy get most of their outpatient care from the private sector.

*Consumer satisfaction with health care*

How satisfied people are with their own health and their health care can be only partly explained by objective criteria; subjective expectations matter. People can also be pleased with their own health care and dissatisfied with their country’s health system as a whole. A comparison of ten OECD countries with different health systems found that in eight countries public satisfaction was related to the level of spending. Canada, with the second-highest expenditure, had the highest satisfaction rating, and people were generally better satisfied with the costlier health systems of France, Germany, and the Netherlands than with the lower-spending systems in Australia, Italy, Japan, and the United Kingdom. Both very high expenditure and great dissatisfaction were found in the United States. The study also showed that having a unified national health system did not guarantee a high level of satisfaction. In most countries 30 to 50 percent of those polled supported "fundamental changes" in the health system. In Italy and the United States many people thought that such changes would not suffice and that the health system should be "completely rebuilt."

Household surveys systematically show that people choose whether to seek care and which provider to consult on the basis of many factors—hours of service, travel time or cost, waiting time, availability of doctors or of drugs, and how patients are personally treated. The time required to get care can be valued according to local wages and treated as a cost of service together with money payments. On this basis, free public medical care often is more costly than unsubsidized private care for which patients do not have to travel so far or wait so long. It is not surprising that, under these circumstances, even poor people express their dissatisfaction with public services by paying for a great deal of private outpatient care. In both El Salvador and the Dominican Republic residents of the poorest quintile of the capital city obtain more than half their ambulatory care from private physicians. Although the price of private care to the poorest quintile is, on average, half that for patients in the richest quintile, it is still fifteen times higher than Ministry of Health fees. Differences in waiting time—one hour for private patients as against two and a half hours at Ministry of Health facilities—account for much of this effect.

Sensitivity to price and travel time is also found in rural Peru and Côte d’Ivoire. But private hospital care is still much too expensive for the poor; even those who use private doctors go to public hospitals. The excessive use of hospital care in relation to ambulatory services often seen in public health systems partly reflects dissatisfaction with the high cost in time and the perceived poor quality of ambulatory care. In the absence of incentives to improve lower-level facilities and service, this overuse reinforces the tendency to concentrate resources on hospitals, urban areas, and less cost-effective interventions.

The importance of public satisfaction with a health care system raises two issues for the package of publicly financed services proposed here. First, it suggests that quality can be maintained only if coverage is broad enough. Services designed only for the poor will almost inevitably be low in quality and will not receive the political support necessary for adequate provision. This is a difficult political issue because it may be hard to maintain equity and control costs if coverage is universal. The proper balance between more care for fewer people and the same amount of care for more people depends on ensuring that the poor have access to the same quality of care as everyone else and on limiting public finance to cost-effective services for which there is a sound rationale. Sec-
ond, reform of public provision alone, important as it may be, may have much less effect on health outcomes, costs, and satisfaction than reforms that also try to stimulate competition and improve people’s access to a variety of providers.

Matching means and ends

The objectives of a health system are to improve outcomes, control costs, increase equity, and satisfy users. Policy instruments, however, do not correspond to individual objectives. What governments actually do is build facilities, buy equipment and supplies, hire and train people, set fees or other service conditions, regulate providers and insurers, disseminate information, determine overall policy, and maintain surveillance of disease conditions or other variables. Misallocation and inequity are caused by mistakes in deciding what facilities to build, where to locate them, how to staff them, and what services to provide. If governments spend too much on tertiary care, for example, not only can they not adequately finance more cost-effective care, but they also cannot provide equitably what care they do offer because facilities will inevitably be geographically concentrated.

One of the principal responsibilities of government is to match the available instruments of policy—the levers the public sector actually controls—to the objectives. Much of governments’ failure to achieve better health outcomes derives not from the wrong choice of objectives but from the wrong choice of instruments—in particular, from too much reliance on direct provision of care and central control of health facilities and too little use of the financial, informational, and regulatory instruments at the disposal of the government. These instruments are particularly important for improving performance in the private market. When governments pay for health care in addition to regulating it, they have a further responsibility to provide value for money by ensuring that public resources go first to cost-effective public health and essential clinical services so as to buy the largest health gain possible.