Challenges and Solutions in Health in Latin America

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Table of Contents

I. Defining the Challenges

The overall challenge can be expressed in one sentence: *People do not always get the health care they need*. Of course to provide all the care that would ever do something to improve health, with no concern for cost, could use far more of society's resources than would make any sense. In fact, spending too much on health care might actually worsen health outcomes, as resources were withdrawn from education, food, environmental protection or other inputs to health. So the challenge or problem can be re-phrased as, *Of the interventions that society decides it can afford, people do not always get all those that they need.* "Intervention" is used in the sense of *Disease Control Priorities in Developing Countries*, 2nd edn (Jamison *et al*. 2006, hereafter DCP2, chapter 15), meaning actions that are not limited to individual medical care—they include public health measures. "Care" in this sense includes even the provision of information about health risks. To the extent that some people get the benefit of needed interventions more readily than others, the challenge is one of disparities.

One way to decompose the challenge and look for ways to address it ascribes the problem to four causes—

People don't realize that they need care (that is, demand is lacking);

They lack access to care, for financial, physical and cultural reasons (health facilities are too costly to the patient, too distant, or impose cultural barriers to their use, such as language differences—these are supply deficiencies);

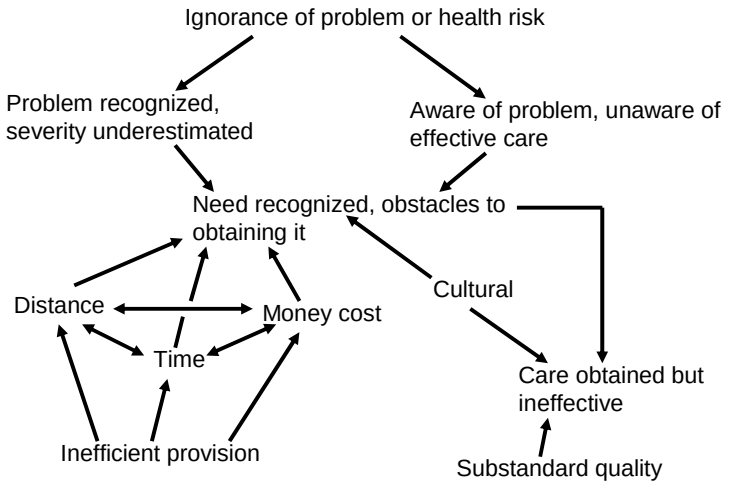
When care is accessible, it is provided inefficiently (priorities are set badly or left to chance, resources are wasted through imbalances among inputs or operation at uneconomical scale, and so on); and

Even when care is accessible, its quality is often substandard (so it does not protect or improve health as much as it could, because providers don't know what to do, or don't act on what they know).

The first two of these challenges arise at the community and household level (Mills *et al.* 2006, p. 90). The third and fourth are characteristic of the level of health services delivery. All the challenges are affected by failings at the higher levels of health sector policy and strategic management, and public policies that cut across many sectors.

Figure 1 elaborates on these challenges and relates them to one another. Failure to recognize a need for care can result from ignorance of risk, underestimation of severity, or not knowing that effective care exists. Lack of access, or failure to obtain care when the need for it is recognized, results from some combination of barriers of time, distance, money cost and cultural obstacles. The first three of these factors interact, so that failure to get care cannot always be attributed to just one obstacle.

Figure 1: Reasons why needed health care is not obtained



This way of defining the challenges differs from that primarily followed in the Copenhagen Consensus volume (Lomborg, 2004), which includes three chapters related to health: 2 (Communicable Disease), 7 (Malnutrition and Hunger) and, to a lesser extent, 9 (Sanitation and Access to Clean Water). The challenges the chapter authors proposed are control of malaria and HIV/AIDS, reducing the prevalence of low birthweight (LBW), improving infant and child nutrition and promoting exclusive breastfeeding, reducing the prevalence of micronutrient deficiencies; and community-managed water supply and sanitation. A paper for the next Consensus meeting in 2008 (Jamison, 2007) also defines disease-specific challenges, including some related to chronic diseases or conditions.

Chapter 2 of Lomborg (2004) also defined "strengthening basic health services" as one of the challenges. The approach taken here is consistent with that, except that it is not limited to "basic" services, however those are defined. It is also consistent with an earlier effort to sketch what should be done in health in Latin America to create a "new state" (Musgrove, 2001). Several further reasons support the emphasis on health systems rather than specific diseases or conditions. First, when in 2006 two groups of UN ambassadors and senior diplomats were presented with the same exercise that the 2004 Expert Panel conducted, both groups moved scaled-up basic health services to the top of the list, ahead of the disease-specific proposals that the Panel preferred (Copenhagen Consensus Center 2006). Putting improved basic services ahead of disease control efforts also is consistent with taking into account the need for functional institutions to carry out any solutions. Several members of the Expert Panel emphasized requirements

for institutional capacity, or criticized the solution papers for paying too little attention to this issue (Bhagwati 2004, p. 609; Frey 2004, p. 615; North 2004, p. 623).

Second, the Latin American respondents to an IDB survey suggested that disparities in access to quality health care represent the highest priority challenge. Third, the disease burden in Latin America and the Caribbean is more diverse than it is in low- and middle-income countries generally, as Table 1 shows. Non-communicable diseases account for 66.7 percent of deaths and 65.0 percent of DALYs in Latin America, 13-16 percentage points higher than in other regions; and this category includes many more conditions that make significant contributions, than occurs for communicable diseases. Among the latter, malaria is much less important, and HIV/AIDS rather less important, in Latin America than elsewhere. Defining the challenges by just a few diseases makes more sense for sub-Saharan Africa and South Asia. The Expert Panel's ranking in 2004 is consistent with an emphasis on Africa (Bhagwati 2004, p. 608; Lin 2004, p. 619), and Jamison (2007) explicitly concentrates on the two poorest regions of the world. And where specific diseases are concerned, there is little new knowledge about the costs or benefits of meeting the challenges, except perhaps for HIV/AIDS.

I.1 ***Ignorance of need means lack of demand***

The estimates of the global burden of disease, the most complete accounting for how sick or incapacitated the world's population is, necessarily count only incident cases of illness or injury (Lopez *et al.* 2006, hereafter GBD). Such estimates derive from contacts with the health care system (formal diagnoses and reports of cases) or on population surveys. They include projections that often go beyond directly observed or reported cases—even for deaths—but they cannot easily find and count people who are

sick but do not know it. Although that that last phrase may seem an oxymoron, people who do not know their health status or the risks to it constitute potentially a major source of unmet need. This can arise for an early and asymptomatic stage of a disease, particularly a chronic condition such as diabetes or cardiovascular disease; or a current risk factor such as smoking, obesity or exposure to toxic substances or pollution. For cases of incipient or early-stage disease, starting treatment earlier may be more cost-effective than when the disease is more advanced. DCP2 includes estimates of the costs and results of early detection for HIV infection that has not yet progressed to AIDS (chapter 18), several kinds of cancer (chapter 20), diabetes (chapter 30), hemoglobinopathies (chapter 34) and dental caries (chapter 38).

There are no estimates of the number of people who do not realize they already have one of these conditions, but two approaches show that unrecognized illness is important as an explanation for inadequate utilization of care. Detecting those cases when the patient is unaware of his or her condition through screening will vary greatly in cost-effectiveness depending on the prevalence of the condition, the target population, the frequency of screening or testing and the cost of treating the previously undiagnosed cases. Table 2 reports the expected results of various cervical cancer screening programs in Brazil. Either of the two less expensive approaches could avert one death for every 100 women screened, while adding less than US$ 5.00 to lifetime costs per woman, compared to no screening and later treatment of cases. The table also illustrates the waste, in lives and money, that results from choosing the least cost-effective program.

A modeling exercise in Australia (Walker and Colaguiri 2007) looks at screening for diabetes, or high risk of the disease, among those aged 45+ with risk factors, and all

those aged 55+, and treating or counseling those who need it. Fully half the prevalence of diabetes is estimated to be due to undiagnosed cases, even in a relatively well-educated population with adequate access to care. Screening would also be likely to find undiagnosed cases of heart disease and other risks.

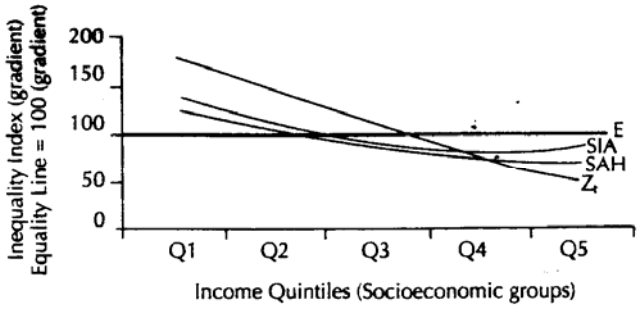
No similar analysis has been conducted for any Latin American country, but it is reasonable to presume that the share of undiagnosed cases is even higher and the potential savings comparable or better. Diabetes prevalence in the region is estimated at 6.0%, affecting 19 million people and causing the loss of nearly 3 million DALYs and economic losses of $ 4-9 billion (Narayan *et al.* 2006, Table 30.1). Some risk factors, notably obesity, are as prevalent as in richer countries, and the costs of screening and lifetstyle interventions should be lower.

An alternative indication of unrecognized disease, or underestimated severity, comes from comparing how respondents in household surveys assess their health status with what they report in time lost to disability, or what epidemiological data show about mortality and morbidity, across income levels or socioeconomic groups. Self-reported health improves with income, in surveys in Brazil, Ecuador, Guatemala, Jamaica, Mexico and Peru, and reported illness decreases, as expected. But the differences by income or socioeconomic group in how people judge their health are smaller—the gradient is less steep, the inequity less—than for rates of mortality and morbidity or for time disabled by illness or injury, as Figure 2 shows.

Comparisons after adjusting for differences by age and sex "suggest that the poor may be less aware of chronic diseases. Lack of awareness of chronic conditions may be due to cultural or educational factors and to relatively low levels of access to or

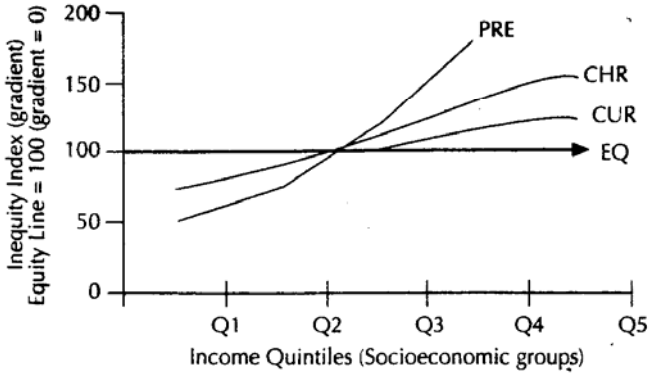
utilization of health care services" (Suárez-Berenguela 2001, p. 130). Ignorance of need may be

Figure 2. Income gradients in measures of health status and utilization of care



E = Equality Line

SIA = Symptoms of Illness or Accident
SAH = Self Assessed Health Status
Z_t = Mortality/Morbidity Rates



EQ = Equity Line

PRE = Preventive
CHR = Chronic
CUR = Curative

Source: Suárez-Berenguela 2001, Figures 1 and 2.

even greater for preventive care, where inequity in utilization by income quintile is much greater than for chronic care. This motivates experiments with conditional cash transfer (CCT) programs, as discussed below. Curative care for acute conditions shows the least difference across income groups; ignorance of need is least likely in that case. These findings do not say how many people are in need without knowing it, or what it would cost to detect unrecognized illness and expand care at a reasonable level of cost-effectiveness or benefit-cost ratio, but they indicate that unrecognized need may be a major problem.

I. 2 Impediments to obtaining wanted care

Once people recognize a need for care, several factors can interfere with their obtaining it. Financial difficulties appear to be the most important of these barriers for most of the population of Latin America and the Caribbean, but two other impediments—physical and cultural—deserve mention also.

Time and distance as barriers to care

Distance to a provider, and the time required to get there, can certainly deter people from using care. However, data on these variables are not systematically collected, and it is difficult to disentangle their effects. So far as the *cost* of travel is important, rather than the *time* taken, household surveys can ask for that information and add it to the cost of care. As a rule, "not having a provider available" is a much less important reason for not getting care, than cost is. Data from Colombia in 1992, prior to the insurance reform discussed below, show that " no provider" explains 12 percent of the cases of forgoing care, in the poorest income quintile. This share shrinks as income rises, becoming insignificant in the richest quintile (Pinto and Hsiao 2007, Figure 6.8).

Naturally, not having a (convenient) provider available is primarily a problem for rural dwellers, who are also often among the poorest. Distance is seldom a significant problem for urban residents; an extreme example, from Delhi, India, is that there are 70 providers within walking distance of every household (Das and Hammer 2007). Using Colombian data again, this time for 1997, the urban-rural difference in the probability of seeing a doctor for a health problem is about 12 percentage points for households with insurance and only 7-8 points for the uninsured. This is consistent with cost being the dominant reason for not getting care. Distance—or more to the point, time—can of course be crucial in emergencies. True emergencies, and not just the use of emergency facilities, are a small share of all medical consultations, but doubtless account for a higher share of preventable deaths and disabilities. There do not appear to be good estimates of these health losses attributable to physical access, as distinct from other problems such as poor quality of care.

Cultural barriers to effective care

Putting aside simple ignorance of non-symptomatic health problems, culture (or "social") barriers can be important in two ways. One is that people harbor mistaken and often dangerous beliefs about health risks and appropriate care. To continue with the example of diabetes—it seems both from casual observation and from the way the disease is often referred to as "sugar" that many diabetics and people at risk believe that by curbing sugar intake, but ignoring other carbohydrates, they can avoid the disease. The anthropological health literature is full of instances of similarly erroneous beliefs that can keep people from recognizing illness or from obtaining appropriate care for it. The other kind of cultural barrier arises when a person recognizes that care is needed, and

consults a provider, but then does not understand or adhere to medical advice because of differences in language or ideas related to a particular culture or ethnic group. In Latin America and the Caribbean, this is chiefly a problem for indigenous peoples, especially when they do not speak the dominant language. Such patients sometimes suffer discrimination in the quality of care they receive, or get little benefit from information.

The household burden of financing health care

"Households in developing countries are exposed to high risks, with important consequences on their welfare" and "the costs related to these risks are much higher than a simple consideration of short term costs" (Dercon, Bold and Calvo 2007). The risk of needing unaffordable care is among the commonest and most dangerous of these hazards, and provides a strong argument for protection against financial catastrophe.

It is well established that prepayment (whether through taxes or insurance) accounts for a larger share of health financing as countries are richer (Musgrove, Carrin and Zeramdini 2002). Out-of-pocket spending (OOP) is most important in poor countries, where there is also the greatest variation in the composition of health spending. Only OOP payments carry the risk of catastrophic or unaffordable levels of spending, so financial catastrophe is more common in poorer countries.. Taxes and insurance obviously reduce what a household can spend on other items, but since both these kinds of financing are related to income and are relatively predictable, they don't threaten impoverishment.

WHO recently analyzed 116 household surveys in 89 countries, including 13 Latin American and Caribbean countries, to assess the extent of catastrophic OOP health spending. Since this effort did not involve new, uniform surveys, the data come from

different years, sometimes more than a decade ago, and do not provide a snapshot of the region at one moment. Nor are they specifically timed to episodes of illness, as exit surveys from health facilities would be. The findings are out of date to the extent that improved economic conditions or deliberate programs to reduce financial risk have occurred since the survey in a particular country.

WHO defines "subsistence" spending as expenditure on food among households between the 45^{th} and 55^{th} percentiles of the distribution of the food share in total spending. This estimate is then adjusted for household size. (If a household spent less in total than its corresponding estimate of subsistence, all its expenditure is considered subsistence.) WHO defines "catastrophic" OOP-health as expenditure exceeding 40 percent of non-subsistence spending. For each survey, OOP expenditure on health is a small share of total household spending, usually below 5 percent, as Table 3 shows.

The share of households suffering financial catastrophe may be as low as one percent or less in countries with more complete financial protection through publicly financed provision (Costa Rica, Guyana, Jamaica) or as high as 10 percent where such coverage is much less complete (Brazil, Nicaragua). Another comparison, between OOP-health spending among the "catastrophic" households and the level of subsistence per capita, also appears in Table 3. In 10 of the surveys, and at least once in each of seven countries, those households spent more on health than the average for subsistence. A detailed study of health financing in Mexico, prior to the insurance reform discussed below, found that "each year between two and four million households either spent 30 percent of more of disposable income…or crossed the poverty line because of their health spending" (Knaul and Frenk 2005).

Although the households with catastrophic expenses account for only a small share of total household spending, they account for a much larger share of total OOP-health spending, roughly half in Bolivia and more than one-fourth in seven other surveys. This is consistent with those households having to use a large fraction of their total expenditure for health—nearly always more than one-fourth. OOP medical expenditures are highly concentrated.

These estimates, while illuminating, understate the burden caused by inadequate financial protection and consequent reliance on OOP spending in at least three ways. First, they refer only to what households actually spent despite the high costs they faced. They say nothing about the care that people needed but failed to obtain because they couldn't afford it. What that care would have cost could easily be a large multiple of the cost of care that was obtained. Unfortunately, there is no easy way to estimate the cost that didn't occur because it was judged to be catastrophic. People who don't seek care they may be reacting to a combination of anticipated cost, distance to a facility, doubt as to whether care will be available and will actually solve their health problems, and ignorance or uncertainty as to what that problem is and what care it requires.

A second reason why such estimates underrate the importance of financial barriers is that when the cost of care is catastrophic, it may matter greatly how it is financed—from savings, by borrowing, selling assets such as land, or taking children out of school and putting them to work. Both the long run financial effects and those on future health will be worse if the household is permanently impoverished. Finally, household surveys usually inquire only after one recent episode of illness or injury. A high one-time cost relative to short-term ability to pay is considered catastrophic, but it

may actually impose less of a burden than smaller but repeated costs required to treat a chronic condition. Table 4 provides data from Brazil showing that among individuals reporting a chronic health problem, the likelihood of consultation with a provider, of follow-up visits to that provider, and of periodic check-ups all rise monotonically with income. Accumulated cost may be a large part of the explanation. (The frequencies for follow-up and check-ups refer only to those who consulted a professional. The data do not distinguish according to people's insurance status or place of residence.) When Latin American surveys ask about such chronic conditions, they concentrate on care and expense only in the last few weeks or, for hospitalizations, sometimes for the past year (Suárez-Berenguela 2001, Musgrove 2005). Since some chronic conditions worsen if not treated, cost that keeps people from obtaining care early may imply greater cost or worse health later. The catastrophic spending that actually occurs during a short recall period is only a lower bound to the welfare loss associated with the need for costly care.

If catastrophic spending C is defined as WHO does, as $OOP - 0.4NS$, where NS is non-subsistence spending, the share of total household spending E that is catastrophic—that exceeds the 40 percent share of NS—can be estimated as $OOP/E - 0.4(NS/E) = OOP/E - 0.4\,[(OOP/E)/(OOP/NS)]$. This calculation appears in the last column of Table 3; it is typically about 10 percent of total expenditure by those households, which means it is a very small share of total spending by *all* households. In turn, that means that "buying out" only that amount of spending through more insurance coverage or public expenditure on health is clearly affordable. However, indemnifying households *only for catastrophic spending* would imply both high administrative costs and opportunities for fraud, so it is not a feasible solution to the overall challenge of financial access to care.

How might people react if what they had to pay for care were sufficiently cheaper to protect them from catastrophe ? Data from a survey in rural Peru (Gertler and van der Gaag 1990) allow estimates of arc price elasticities for health care differentiated by income quartile, age (adults versus children), price level and type of provider; Table 5 shows these results. "Price" includes the attributed value of travel time, which is small compared to monetary cost and reinforces the emphasis here on the latter. The poorest quartile would increase the use of care almost proportionally to price decreases or even more, for both public and private providers.

The Peruvian data on catastrophic spending in Table 3 suggest that to eliminate altogether only that spending beyond 40 percent of non-subsistence expenditure would require a reduction in cost to households roughly equivalent to 10 percent of their total spending. That would still leave them exposed to an OOP cost of about 20 percent of total expenditure. Multiplying that price decline by the elasticities for the lowest quartile, which range from –0.20 to -1.80, implies that the use of health care would increase by an amount corresponding, in value, to as little as four percent or as much as 36 percent of total spending among those households experiencing catastrophic costs. This exercise compares data from rural areas only in 1985-86 to country-wide information a decade or more later, so the calculation is approximate at best. Given the small share of households with catastrophic expenses in 1994 and 2001, these numbers suggest that capping costs at 40 percent of subsistence spending would imply an increase in health care utilization of only about one percent of the value of total household expenditure. But a price reduction of the magnitude to produce that effect would lead to a much larger increase in care-seeking, because it would also affect the non-catastrophic OOP-health spending of all

households, at least at lower incomes. The financial barriers to care are higher overall than appears from examining only those households for which the impact is calamitous. The effects are surely larger where the share of catastrophic spending is higher.

This analysis concentrates on the effects of high OOP costs in impoverishing households or preventing them from getting needed care. But patients can get care, particularly if the costliest part of it is free or covered by insurance, and yet get little benefit from it because they still have to pay for drugs. A high OOP cost of drugs leads to reduced adherence to treatment and therefore less effective care. In one study, international differences in the cost to patients of drugs for kidney failure led to differences in compliance, with implications for the progression of disease and the need for dialysis or transplants (Hirth *et al.* 2007). This occurs to a significant degree even among high-income countries; the impact among poorer populations is surely greater. Financial protection that covers only some of the inputs to health interventions can prevent financial catastrophe and still expose people to serious health risks. Because patients very often have to pay for medications out-of-pocket, high drug costs can pose a financial barrier even if they represent only a fraction of the total cost of a service. The fact that patients are often willing to pay for drugs does not mean they get all the drugs, or all the care, that they need.

I.3 ***Inefficient provision***

The provision of health care in Latin America and the Caribbean is widely criticized as inefficient, but it is hard to find good measures of wasted resources or excessive cost. Conceptually, it helps to distinguish four sources of inefficiency:

Health services deliver the wrong interventions, in particular providing less cost-effective care when more cost-effective alternatives exist. This failure of allocative efficiency is the chief focus of the DCP2 exercise and prior such efforts (World Bank 1993; Jamison *et al.* 1993) that analyze interventions offering the greatest health gains per dollar. No study has estimated how much cost could be reduced in one country by always choosing the most cost-effective intervention for each problem, although many specific choices can be shown to be cost-saving. It is worth noting, however, that while cost-effectiveness is a good criterion of efficiency for choosing among responses to a *given* health problem, as illustrated in Table 2, it is somewhat more questionable for choices among different disease or conditions, in part because different population groups may be affected. No fewer than nine criteria exist for choosing what to buy with public resources (Musgrove 2004a), and these can conflict with one another—particularly with equity considerations.

Inputs are provided in the wrong proportions, so that output is limited by the scarcest input and others are idle or underutilized. This failure of technical efficiency typically arises as shortages of drugs or other supplies, or deteriorated capital, which makes human resources relatively superfluous and less effective than they could be. At the same time, drugs may be over-prescribed, with little attention to interactions among pharmaceuticals. Theft of supplies and other forms of corruption are one cause of this problem (Savedoff 2007; Lewis and Musgrove 2007), but imbalances occur even without crime, if budgets are rigid and are set inefficiently.

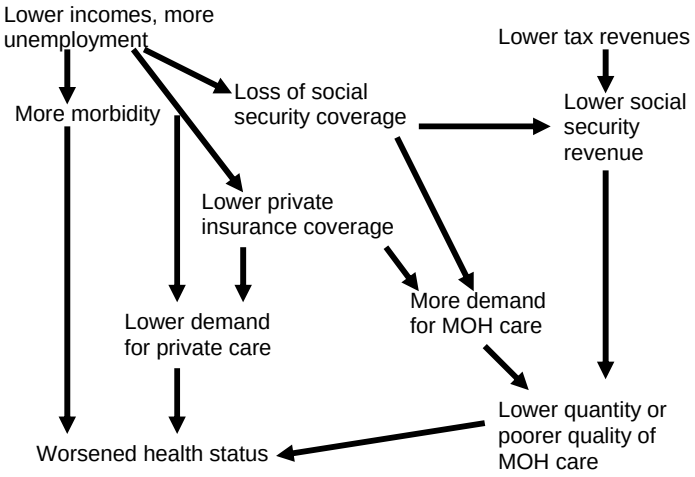
Facilities, especially hospitals, operate with diseconomies of scale or scope. This kind of inefficiency arises partly from misguided investment decisions in the public

sector and partly from a poor distribution of responsibilities and capacities among the different levels of the health system. The various inefficiencies that plague hospitals in low- and middle-income countries generally are estimated to absorb as much as 10 percent of total health spending (Mills *et al.* 2006, p. 87). A study of hospital economics, including a sample in Colombia and some data for Argentina, Jamaica, Belize and St. Lucia (Barnum and Kutzin 1993, especially chapter 3), includes cost functions and indications of economies of scale and scope, but none of the usual measures of hospital operation—average cost per patient, average bed occupancy, bed turnover rate per year, and average length of stay—is by itself an indicator of efficiency. Using the latter three indicators together can suggest where excess bed capacity exists, some hospitalizations are likely to be unnecessary, or average stay is longer than needed, but comparisons are complicated by the absence of information on case mix.

The health system is dynamically inefficient because public spending is pro-cyclical and exacerbates rather than offsetting fluctuations in private employment, insurance coverage and health expenditure. This was especially a problem in Latin America during the 1980s, when macroeconomic conditions were unstable (Musgrove 2004b). The share of families facing financial catastrophe is not a fixed feature of a country or its health system: surveys in different years in Bolivia, Nicaragua, Paraguay and Peru show (in Table 3) substantial variation as economic conditions change. Economic contraction raises the risk of financial catastrophe through various channels, as Figure 3 shows (Musgrove 2004b, Figure 20.1). Budget cuts can have a more than proportional effect on the availability of care, because they not only stop investment, including maintenance, but protect the staff and leave facilities without drugs and

supplies, so that effectiveness and efficiency suffer (Petrera 1989). Under such conditions, stabilizing the macroeconomy may be the single most effective measure a government can take to improve health. Controversy continues over whether the stabilization measures promoted by the International Monetary Fund are too rigid and constrain health expenditure needlessly (Center for Global Development 2007).

Figure 3. Health effects of economic contraction, when public spending (MOH and Social Security) is pro-cyclical



The dynamic inefficiency arising from the interaction of public and private financing and provision in health is arguably most severe when each sub-sector provides about half of health care spending. If the public share is very small, it simply cannot accommodate sizeable fluctuations in private expenditure or demand; whereas if it is much larger than half, the changes needed to compensate for private fluctuations are more easily managed. These problems are exacerbated by short-run political cycles and consequent myopic planning and lack of institutional memory. In good times, extra resources may be committed to investments that may not be maintained or operated adequately, or appropriated by public employees in the form of unsustainable higher wages. In lean times, investments can be stopped but not undone, and workers in the

public sector tend to resist the changes, especially staff reductions, that may be needed to keep the system from becoming unbalanced and unproductive. Latin America suffers more than other low- and middle-income regions from procyclical expenditure (Clements *et al*, 2007, p. 12), making it particularly important to control this source of inefficiency.

I.4 *Substandard quality*

Quality of care, like efficiency in delivery, is commonly criticized as inadequate and also is difficult to measure satisfactorily. It is still harder to estimate how far substandard quality care contributes to poor health or excess mortality. In the extreme, failures of quality that can be classified as medical errors cost many lives—an estimated 44,000-98,000 preventable deaths in hospital annually in the United States, for example (Institute of Medicine 2000). It would be surprising if medical mistakes did not occur at similar rates in Latin America and the Caribbean, but no such aggregate estimate exists. In the major countries of the region about 60 people per thousand population are hospitalized each year (PAHO 2007), for a total of slightly more than 30 million admissions, roughly equal to the 33.6 million in the United States from which the estimates of errors come. Assuming a comparable ratio of preventable deaths to hospitalizations—that is, from 1.3 to 2.9 per thousand admissions—would imply that poor quality care in hospital kills at least 41,000 people every year in the region, and perhaps as many as 92,000. Differences in case mix between Latin America and the United States only add to the uncertainty of such estimates.

How much more health damage occurs due to mistakes in outpatient care is even less well known; but medical errors in both hospitals and ambulatory care are considered to be so common, world-wide, that WHO has developed, together with the Joint

Commission and the Joint Commission International, a set of nine patient safety solutions (WHO Collaborating Centre 2007). These include such simple and well-known—but not always followed—procedures as correct identification of patients and frequent hand-washing, besides more sophisticated controls of medications, electrolyte solutions and connections between catheters and tubes.

When a well-defined protocol exists for how to diagnose and treat patients presenting with specific symptoms (fever, cough, diarrhea, etc.) or for prenatal care, it is possible to quantify either or both of two other measures of quality. These are (1) how well providers know what they should do ("competence"), as tested by questioning them with the aid of vignettes; and (2) how well providers actually do what the protocol calls for ("effort"), by observing encounters with patients or interviewing patients after a consultation. A recent study in rural Mexico (Barber *et al.* 2007) takes the second approach to judge the quality of prenatal care, and a study in Paraguay (Das and Sohnesen 2007) uses direct clinical observation to assess "doctor effort" in a variety of patient encounters. These analyses, plus others in India, Indonesia and Tanzania, are summarized by Das and Gertler (2007), who conclude that "Variations in practice quality are likely to explain a large fraction of the variance in outcomes, even in low-income settings". Similar failings in quality are documented in other developing countries (Peabody *et al.* 2006).

The Mexico study reports the percentage of times that providers in different sub-sectors performed each of 14 standard prenatal care procedures. As Table 6 shows, the percentages, while often above 80%, sometimes fall below 50%. Four kinds of variation among providers and patients stand out:

Contrary to widespread belief, public providers often outperform private ones;

Doctors (with an MD-equivalent degree) perform better than those without a degree; the latter are more common in the private sector;

The poorest quartile of patients receive markedly worse care than the least poor quartile, in the private sector (but there is little difference in the public sector); and

Indigenous women receive less complete care in the private sector, with little difference in public institutions.

In contrast to the discrimination by income and indigenous status in Mexico, the Paraguay study finds no differences in doctor effort according to patient characteristics—except for a tendency to devote *more* attention to poorer patients, giving them more time or asking more questions and performing more examinations. Controlling for doctor and patient characteristics and for symptoms, more effort always increases the probability of completing essential examinations and—to a lesser extent—of asking all the appropriate questions of a patient.

Studies limited to just two countries and a few conditions, and using different methods, are scant basis for generalization. Still, these results, together with those for the other countries, suggest several conclusions. First, quality is often unacceptably low, even for well-defined and uncomplicated situations. (More complex procedures, particularly surgeries, might be performed even worse, but might instead be done better because of better training.) Second, both qualifications and effort matter—but competence does not guarantee a corresponding degree of good performance. Third, variation among providers, and discrimination among patients, can be substantial, but do not have to be. Each difference has implications for the solutions to quality deficiencies.

II. Defining the solutions

When health challenges are defined in disease-specific terms, the corresponding solutions are specific interventions, as illustrated in Lomborg (2004) and elaborated n DCP2. Defining the challenges systemically means that the solutions must also be systemic, and often on a scale large enough to be called health sector *reform*. The larger the scale of the solutions, the harder it is to estimate their costs or potential outcomes. Questions of feasibility and of how to "get health reform right" also become more important (Roberts, Hsiao, Berman and Reich, 2004). The discussion here will first characterize the proposed solutions qualitatively, and then say something about what they might cost and what kind and value of benefits they could provide. In contrast to disease-specific solutions, which can often reduce the burden of one disease or condition without interaction with other health problems, the systemic solutions are synergistic: applying them all together would yield more than the sum of the benefits of each solution taken separately. Interactions among them are the norm.

Corresponding to the four challenges indicated above are four sets of measures to:

Increase access to care;

Raise quality;

Improve efficiency of delivery; and

Reduce ignorance or misperceptions of needs.

Measures to improve access to care are treated first because they appear to be the largest-scale solution and because only they directly attack the problem of financial risk, whereas all four kinds of solution aim to improve health status. (Improving quality and efficiency could also reduce financial risk, to the extent that they protect patients from

the need to repeat care or to pay more than care should cost.) Raising quality is put second because together with better access, it matches the highest priority of respondents to the IDB survey. It also appears to be somewhat more straightforward to achieve, with fewer economic and political obstacles, than the third solution of improving efficiency of service delivery. Finally, while increasing understanding of health needs is undoubtedly important, it applies chiefly to non-symptomatic conditions and risk factors. Progress on the other solutions would probably have the desirable side effect of increasing the public's knowledge and thereby leading to more, and more rational, demands for care.

II.1 ***Improving access to care***

The Cuban health system provides close to universal, free access to care, and so could be a model for the rest of Latin America. However, it was created only following a revolution; it excludes not only private insurance but also legal private practice by providers; and it requires a higher ratio of physicians to population than other countries have achieved or appear to aspire to. The discussion here considers experiences in countries characterized by mixed systems of both finance and provision, where efforts to extend access start from the *status quo* and differ according to each country's situation.

The solution needed is some kind of universal insurance coverage, with services to be delivered by qualified providers independently of their public or private, for-profit or non-profit status. That means competition among providers; and since insurance for the poor will have to be subsidized, it means using public funds to pay private providers, if that is not now done in a country's health system. It may, but need not, mean competition among insurers. Defining the solution this way means rejecting some other ideas, particularly that of simply expanding the network of public facilities. Insurance,

and the inclusion of private providers, are consistent with the evidence that financial barriers to care are more significant than physical ones of time or distance, for most of the population. It is also consistent with the fact that private providers are often available in places lacking public facilities, and local residents need to be free to use them.

An extension of formal or explicit coverage to the entire population can take many forms; three examples, from Chile, Mexico and Colombia, are briefly considered here. Many middle-income countries in other parts of the world are also extending coverage, sometimes by quite different models, leading to efforts to derive lessons for other such countries and for those still poorer (Mills 2007).

The Chilean model requires all wage and salary workers to contribute seven percent of their pay either to the National Health Fund (FONASA) or to a private insurer (ISAPRE) of their choice. Higher-paid workers tend to buy private insurance and can pay out of pocket for more generous coverage; the lower-paid tend to register with FONASA and are classified into four groups by income. Which providers they can use depends on that classification; public facilities are of course available to all. The ISAPREs compete for clients; only at the margin where the seven percent contribution will buy a benefit package slightly better than what FONASA offers, do they compete with the public sector. This arrangement suffers the usual problems of a competitive private insurance (Fischer and Serra 1996), but it is saved from the worst failings of an inequitable two-tiered system by two features. First, FONASA is also financed from general revenues, so that its enrollees obtain benefits costing more than their contributions, and the poorest are fully subsidized. This makes the system much more equitable than the health-specific financing alone would allow (Bitrán y Asociados

1999). Second, any medical intervention which the Ministry of Health guarantees to provide must also be provided by the ISAPREs. They are free to adjust their premiums accordingly, but not to deny care or to charge more for those interventions. Protection from financial risk is an explicit objective of the system and is largely achieved (FONASA 2007).

A different approach is taken by the *Seguro Popular* in Mexico (Knaul and Frenk 2005). This is a newly created (2003) insurance for those households (about half the population) not covered by either social security (*Instituto Mexicano de Seguridad Social*, IMSS, for wage and salaried workers) or the scheme for public employees (*Instituto de Seguridad Social de los Trabajadores del Estado*, ISSTE) and too poor to afford private insurance, who were therefore dependent on services provided by the Ministry of Health. Enrolment is voluntary and meant to expand gradually until 2010, with preference initially for the poorest, who are fully subsidized. Households in the upper eight income deciles pay an income-dependent contribution of up to five percent of disposable income. Public financing comes from both the federal and state governments, with the shares varying according to the states' income levels. The *Seguro Popular* does not compete with the established schemes, in which enrolment and contribution are mandatory. It does promote competition among providers. There is a separate fund for public health measures, and another for catastrophically expensive care, to protect financing for those elements that might otherwise be neglected in a purely demand-side scheme. Fully subsidized households must participate in health promotion activities.

The third model is that of Colombia, which instead of a specific insurance, as in Mexico, created the conditions for a new class of insurers to compete for clients and a

new funding mechanism to finance them. The reform launched by the Law 100 of 1993 also decentralizes public responsibilities for health care and splits the financing between a contributory regime and a subsidized one, with the latter receiving a less generous benefit package. The *Sistema General de Seguridad Social en Salud* (SGSSS) has been in operation for over a decade, and is arguably the most far-reaching scheme for universal coverage, since it implies competition among all kinds of insurers and providers.

The Colombian reform has been extensively studied (Pinto and Hsiao 2007). As in Mexico, it has greatly expanded explicit insurance coverage. It has also illustrated the difficulties of making competition work, particularly in rural areas; in consequence, it has not been possible to shift entirely to demand-side financing without the risk of putting public facilities out of business. Shifting public staff among providers to match the new demands for care has also proved complicated, and political resistance has been strong enough to slow the expansion of coverage and probably to raise the costs somewhat.

These three approaches cover a range of possibilities for a solution to universal coverage. Each reflects something of the country's pre-existing health system, and none serves as the obviously preferable model. While each has been subject to some evaluation, they differ too much in how long they have been operating and in so many other features that it is impossible, or at least unwise, to rank them. In particular, the appropriate degree of competition, especially among insurers, is an open question. The main points of this discussion are that—

several paths to universal insurance are already operating in Latin American countries that formerly left large populations uninsured;

a serious attempt to enroll the uninsured can expand coverage rapidly, despite obstacles. The Mexican scheme had enrolled 1.7 million families, 13 percent of the target population, by its second year of operation; the Colombian scheme had enrolled 13 million people (contributors and subsidized beneficiaries) within its first decade;

all these schemes aim primarily to finance demand for care rather than its supply, but a mixed financing arrangement may be required by the limitations of competition among providers, including local monopoly situations in rural areas;

an explicit guarantee of coverage requires the definition of the package of care, which establishes the rights of patients and the basis for rationing decisions. This can facilitate improvements in quality, as discussed below;

any of these approaches is preferable to creating narrowly defined insurance for specific groups such as women or children or only for specific diseases or only for the most basic or primary care; and

although a two-tiered system is theoretically undesirable on ethical grounds, it may be the only feasible way to expand coverage significantly. Moreover, the worst dangers of a two-tiered system can be avoided if beneficiaries have access to a wide range of providers and there is substantial subsidy from the better-off to the poor, either within the scheme or through transfers of general revenues or both.

Uruguay is currently developing its own model of a national health insurance, to proceed in stages—from expanding social security by the incorporation of 800,000 beneficiaries through the inclusion of spouses and minor children, to retirees, and eventually the whole population (Olesker 2007). The intention is to unify the various

sources of finance for health in a single national health fund, somewhat on the Chilean model.

II.2 *Raising quality of care*

When people don't have access to care, its quality can hardly matter to them. Once they do have access, quality becomes paramount, because "better quality can improve health much more rapidly than can other drivers of health, such as economic growth, educational advancement, or new technology" (Peabody *et al.* 2006, p. 1293). The US Institute of Medicine treats quality as composed of six elements: safety, effectiveness, patient-centeredness, timeliness, efficiency, and equity (IOM 2001). The first two aspects—that care should be effective and not pose needless risks to the patient—are most closely associated with provider competence and effort. Timeliness is important to boths, especially in emergencies. These are all measures of *process*, which is the preferred place to measure quality, rather than by *structure* or *outcomes*.

Peabody *et al.* (2006) classify measures to improve quality in two categories: those affecting the whole health system, and those directly affecting the practice of individual providers or facilities. The former category includes legal mandates and their enforcement; accreditation and administrative regulation, which can keep out unqualified providers but otherwise have little impact on quality or its variation among providers; the development and use of clinical guidelines; targeted education; and organizational changes. The last of these can improve care substantially but imply sizeable investments of time to design, implement and evaluate. The individual-level category includes peer review feedback in training staff, measures to assure that providers give a high volume of care, and rewards, both monetary and non-monetary, linked to measurable performance. Measuring quality in ways that are easily understood and resistant to manipulation is crucial to all efforts to improve care.

Because many different approaches can be taken to improve quality, and the results will depend on how good or bad quality is *ex ante,* it is difficult to specify just what should be done in any one country or facility, still less for the whole of Latin America and the Caribbean. The most important intervention to pursue is that of training with peer review for primary care—not only for childhood illnesses but for all complaints that are common and for which sound guidelines exist. A somewhat broader approach to training would allow for changes in the skill mix of providers or in the way different services are related (Preker *et al.* 2006). Substantial organizational changes may be desirable but are less urgent because they involve still more systemic reform, higher costs and more uncertainty.

II.3 ***Improving efficiency***

The two interventions already discussed—providing universal insurance coverage and improving quality—should both have the welcome side effect of improving the *technical* efficiency with which care is delivered. Greater competition among providers, as private physicians and facilities are financed publicly, may improve efficiency either by shifting care from less efficient public providers to more efficient private ones, or by forcing public providers to compete on quality and cost rather than, as traditionally, chiefly on price. Not too much should be expected from this approach, however. Private providers do not always use resources more economically, nor do they always deliver better quality; and the scope for competition is limited by the need to continue some supply-side financing, particularly in rural areas. Similarly, while an emphasis on quality may push providers toward greater efficiency, the outcome will depend on how

performance is measured and rewarded. If better quality means doing more for patients, cost of care will increase rather than decrease.

There is no shortage of advice on how to make health facilities operate more efficiently by minimizing resource use for a given output. Much of this thinking centers on the concept of *new public management,* implying a "rejection of traditional, hierarchic forms of public sector management" (Mills *et al.* 2006, p. 92). Instead of rigid planning and control, what is wanted is more local autonomy, but also closer supervision, and more readiness to separate finance from provision of services, sometimes by contracts between public agencies and private providers. The three examples of expanded insurance coverage discussed above in Chile, Mexico and Colombia all include such elements. Public funds pay for both private and public provision, and patients—with some exceptions, as in Chile—have free choice of providers. New public management is characterized in the first place by the recognition that health services *need to be managed*, that professional skill in management is as important to good health outcomes as the medical skills of practitioners (Preker *et al.* 2006, p. 1341).

Beyond these general ideas, there is evidence that "management strengthening" interventions have generally positive effects. However, there is little basis for uniform prescriptions, and efforts to improve technical efficiency often run into serious opposition from providers. The safest recommendation is that countries need to experiment with improvements in managing people, capital or physical assets, and drugs and other consumables. Making health service delivery more efficient is partly a technical problem, but it is also always a political problem.

The measures that promote better use of resources in the technical sense do not necessarily have any effect on *allocative* efficiency. Setting priorities for what health interventions to provide or finance is an even more political question than technical efficiency, since it often means making choices among patients. There is no ideal solution, but the best single best recommendation is to make much more use of cost-effectiveness as a criterion to get the largest possible health gains from a given level of expenditure. The most striking such use is the *Programa de Acceso Universal de Garantías Explícitas* (AUGE) in Chile, which has added 56 treatments to the list of services the Ministry of Health guarantees to patients and therefore also requires private insurers to provide (Vargas 2007). Another 24 treatments are under consideration. The decisions on interventions draw on research into the unit cost and required total expenditure on each service and the likely effectiveness in healthy life years saved. For the most part, this information was not previously available, so the exercise has had the beneficial effect of requiring clinicians to study their outcomes and their use of resources in detail. The distinction between high, medium and low priority also takes into account prevalence, the burden of disease, the financial burden on households, and public preferences among diseases and conditions.

One other solution to the problem of efficiency looks less urgent today than it did 20 years ago, but still belongs among the recommendations. That is to limit the dynamic inefficiency of the public system in health by reducing the volatility, and especially the natural pro-cyclical character, of public expenditure for health. An expansion of publicly-financed, explicit coverage obviously helps to dampen the interaction with the private sector and reduce the effects illustrated in Figure 2, above.

II.4 *Increasing public knowledge*

The challenge is that people don't always know when they need health care, so the solution has to be to increase their understanding by supplying correct information about diseases, symptoms and risk factors, and combating misperceptions that prevent people from obtaining care or from benefiting fully from it. Particularly where changes in diet and lifestyle are concerned, it is easy to say what behaviors are protective, but much harder to show that interventions to promote those behaviors are cost-effective, or—sometimes—even that they are effective at all (Willett *et al.* 2006).

The cheapest way to increase knowledge is through messages to the public via print and electronic media, without any face-to-face interactions. The next most expensive method is to offer face-to-face contact and counseling. The next costliest is to provide diagnostic tests such as those for blood pressure, anemia, glucose concentration, eyesight and hearing, or antibodies to particular pathogens. Preventive interventions against HIV/AIDS employ all three methods, combining testing for HIV status with counseling (VCT). That approach makes sense for a particular, and particularly dangerous, communicable disease, when those infected may not be aware of it. It is less clear whether face-to-face transmission of information, with or without diagnostic tests, is worth while for health-related information in general.

Finally, the costliest way to increase knowledge of health needs and healthful behaviors is to pay people to attend educational sessions as part of a conditional cash transfer (CCT) program in which they are also remunerated for attending prenatal care, well-baby clinics or regular health center visits, or for having their children fully immunized and kept in school. Programs of this type in Brazil, Colombia, Honduras,

Jamaica, Mexico and Nicaragua have been subject to varying degrees of evaluation, and the findings synthesized (Glassman, Gaarder and Todd 2006). These programs have a price effect, to the extent that beneficiaries would otherwise use, and have to pay for, the preventive and health-promoting services that are conditions of enrolment. The cash transfer means there is also an income effect, which by itself may be enough to increase food consumption and improve the diet, leading to the widely observed effect of reduced stunting among very young children. The cash transfer also has the effect of compensating beneficiaries for the indirect costs of access to health care, particularly the cost of lost time from work.

CCT program design is based on nine assumptions, notably that the poor suffer not only from low incomes but also from insufficient knowledge of health, and that information induces desirable behavior change—but also that it is necessary to require attendance at health clinics for specific services. The natural targets for such programs are poor households with young children or pregnant women, who would benefit from greater use of preventive services especially. Regular check-ups may also lead to more treatment of acute conditions, and even to better detection and control of some chronic conditions such as hypertension and diabetes among adults.

Providing universal access to care is almost sure to lead more people to consult about symptoms, fears or doubts, and therefore to more cases of disease or risks detected. The effect will be still greater, if quality is simultaneously improved so that diagnostic opportunities are not missed and people are adequately counseled about their health. How much more should be undertaken ? The appropriate solution seems to be to start with population surveys to gauge public knowledge of important health problems.

Questions about risk factors and diseases can be included in the health module of a standard household survey and need not be limited to questions to mothers about pregnancy and child care—as they often have been in the past (Musgrove 2005). Balancing that information about what people know with estimates of the undiagnosed prevalence of a condition provides the basis for a judgment about screening for that condition. Depending on prevalence, the state of public knowledge, and the cost of a screening program, the public health authorities can decide how much effort to put into the program, and in particular whether to offer free screening to a particular population group. Certain tests—notably for blood pressure—of course can and should be part of routine outpatient visits; here the solution is to train medical staff not only to perform the test but to counsel the patient when the results indicate it.

III. Costs of improving utilization of good quality care

Of the solutions discussed here, the extension of insurance coverage is by far the most costly. It is also the only one for which approximate estimates of cost are possible, since the interventions for improving quality and efficiency and informing the public can usually be specified only qualitatively. (A few exceptions are indicated in section III.3, below.) What they would cost to implement depends on their exact content, which can be drawn from a wide range of alternatives. In some cases there is evidence that the solutions would be cost-saving, which is equivalent to providing monetary benefits alone in excess of costs.

It is not easy to estimate even the cost of extending coverage, since reforms of the magnitude in operation in Chile and under way in Mexico and Colombia do not simply introduce new resources to apply to the health care of people who formerly had no health

expenses. Spending is redistributed on a large scale, as households reduce their own OOP costs and financing shifts toward insurance premiums and tax revenues. The net cost to society is less, possibly much less, than the net cost to the public sector.

One important question is the cost of scaling up: what happens to the marginal cost of including one more household as the number of households is increased ? The available data on costs of major reforms do not provide an answer to this question, since over the years that it takes to enroll millions of people, costs also change because of inflation, changes to the benefit package or other modifications to the program, and the exact way in which coverage is extended geographically. Extending coverage does not necessarily start with the population easiest to reach and climb an ascending marginal cost curve thereafter. In fact, if the object is to protect the most vulnerable, notably the rural poor, the earliest beneficiaries may be the most costly to incorporate, with cost declining as coverage is extended to cities and to the less poor. It should also be noted that the costs that vary with the extent of coverage are those of identifying and recruiting beneficiaries and the other administrative costs of the system, whether these are borne by government or by insurance intermediaries. The premium that contributing beneficiaries pay and the payments to intermediaries do not vary with the scale of operation. The costs of health care will vary with scale only so far as people with different levels of utilization or more costly medical problems are enrolled at different stages of the expansion.

Data from Colombia are used here for rough estimates of cost; whether those costs are justified by the resulting benefits is considered in section IV. Relying on the experience of just one country is risky, but few other countries have undertaken so far-reaching an attempt to reach universal coverage. Colombia seems to offer as good a case

study as there is of the magnitude of the challenge and the costs and potential benefits of meeting it. There are also recent detailed data on expenditures for the *Seguro Popular* and for other public health spending, in Mexico. However, they cover a shorter period and have not been the subject of as much evaluation. Subsequent comparison with Chilean and Colombian experience may be of particular value since the new insurance in Mexico is a single-payer scheme and involves much less interaction with other forms of coverage, particularly private insurance, than in either Chile or Colombia.

III.1 ***Cost of expanding access in Colombia***

The Colombian model is examined for a number of reasons:

it has recently been analyzed in considerable detail. Some authors (Pinto and Hsiao 2007) state that "no actuarial studies of the real cost of providing the benefits package have been undertaken". A more recent set of studies has tried to estimate costs and outcomes more exactly (Tono *et al.* 2007; Giedion *et al.* 2007; Escobar *et al.* 2007; and Glassman *et al.* 2007).

there is a recent analysis of national health accounts for the decade 1993-2003 (Barón 2007);

the scheme attempts to promote efficiency through competition both among providers and among insurers; and

from 2003, the scheme includes regulations to measure quality and promote its improvement.

Enrolment in the contributory part of the Colombian health system expanded from about 28 percent of the population in 1992, just before the reform, to a peak of almost 40 percent in 1998. It then declined, due to economic recession, until 2002, before

rebounding in 2003. From 1998 to 2002, all the growth in total coverage came from the subsidized regime. This has limited the capacity for further expansion, since the subsidized regime is designed to be financed partly by about one-eighth of the revenue of the contributory regime. For purposes of estimating cost, data are taken from 2002-2003 only. Whether this represents a stable estimate is unsure. The redistributive effects come from comparing 2003 with 1993.

In 2002, the premium for the contributory regime was 300,684 Colombian pesos, or US$ 120 at the official exchange rate (and $ 413 in purchasing power parity). The premium for the subsidized regime was half that, corresponding to the less generous benefit package, or US$ 60-61. With 5.3 million contributors and 8.0 million subsidized beneficiaries of the Solidarity and Guarantees Fund (SGF), the average premium was US$ 84. The SGF took in 4.74 billion pesos and paid out 4.59 billion, of which 3.99 billion was premium payments to the intermediaries that administer the insurance and another 0.24 billion was transferred to specific non-premium funds (Pinto and Hsiao 2007, Tables 6.2 and 6.5). If that were the whole cost of operating the insurance, one could conclude that coverage could be extended for less than US$ 100 per capita per year if part of the population received a more limited benefit package, and for $ 120 if everyone got the full package.

Unfortunately, it is not that simple, because there is still substantial supply-side financing in the system—27 percent of the total expenditure through the SGSSS in 2003 (Barón 2007, Anexo A-11). Inflating the premium amounts accordingly suggests the per capita cost of the scheme is about 37 percent higher than the premium amounts alone suggest, or about US$ 164 for coverage of the full package or $ 83 for the fully

subsidized coverage. This compares to per capita total health spending of US$ 136. As of 2007 the premiums paid to the municipalities for coverage of their populations had risen to US$ 117 for subsidized beneficiaries and $ 208 for contributors, slightly below the monthly minimum wage of $ 223 (Escobar, private communication). The total population eligible for subsidy is estimated at 22 million, of whom only about 8.5 million were covered in 2003. Extending the subsidized package to the remaining 14 million people would cost, on these assumptions, about US$ 1.16 billion. However, those eligible may include about 9 million who would need the full subsidy, and another 5 million who would be partly subsidized and pay a small contribution (Jaramillo 2007), so the public cost of universal coverage would be slightly less, around US$ 1 billion.

In 2003, expenditure by the SGSSS was 3.5 percent of GDP and 44.5 percent of total health spending. Full coverage by the subsidized regime would have required public spending of an additional one percent of GDP. In fact, direct (non-social insurance) public expenditure on health had already risen by 0.8 percent of GDP since 1993, while social insurance expenditure rose from 1.6 to 4.3 percent of GDP. This increased insurance spending allowed private and OOP spending, mostly the latter, to fall dramatically, from 3.3 to 1.2 percent of GDP, so that total health spending rose only from 6.2 to 7.8 percent. As shares of national income, the redistributive effect is much larger than the effect on total spending. These changes accompanied an increase in coverage of the population from 23 to 63 percent, while the population itself grew by more than seven million. In absolute numbers, then, the insured population increased by 19.5 million (Escobar *et al.* 2007, Table 2). Some 16.5 million people remained uninsured.

III.2 *Other costs of systemic improvement in Colombia*

As discussed above, there is no good estimate of the additional costs that would be imposed in Colombia by the other solutions for raising quality and efficiency—but it seems safe to assume they would be small in comparison. Expenditure on health promotion and disease prevention has risen dramatically, from only 2.0 percent of total health spending in 1993 to six percent or more in most years since 1995, so there is probably ample funding for the informational activities needed. Training is still a small share, only 0.1 percent, in recent years (Barón 2007, Cuadros 3.4 and 3.5) and probably needs to increase in order to improve quality. When it comes to efficiency, the principal worry derives from the multiplicity of insurance intermediaries. Administering the system, including the private insurers outside the SGSSS, absorbs fully 15-16 percent of total health spending, although strictly comparable data across all insurers do not exist (Escobar 2007, personal communication). Delivery of services takes only about two-thirds of expenditure, down from 80 percent in 1994-95. By coincidence, the administrative cost of about US$ 1.1 billion is roughly the same as the cost estimated above, for extending coverage to the rest of the population eligible for subsidy.

III.3 *Other cost estimates*

Quality improvements in general appear to provide large gains at relatively low cost, although exact cost estimates or comparisons to outcomes and benefits for individual interventions are hard to come by. The cost of applying such measures universally has not been estimated, but it is reasonable to suppose that the net effect would be cost-saving, or that monetary benefits alone would exceed costs. The principal component of cost would be training and supervision; relatively little investment is

needed in supplies and equipment. The potential gains are very large. The hospital deaths in the United States that could be prevented by better quality control were estimated to cost the economy $ 17-29 billion per year (IOM 2001), surely far in excess of what it would cost to avert many of those errors. Losses representing the same share of Gross National Product (GDP) would amount to $5-10 billion in Latin America and the Caribbean , in purchasing power parity (PPP) terms.

Detailed modeling exercises have shown that training providers on specific protocols for diagnosing and treating common childhood illnesses—pneumonia and diarrhea—is very cost-effective when initial quality is low and disease incidence is high. Children's lives can be saved for as little as US$ 14, but more generally for US$ 100-1,000, suggesting relatively high benefit-cost ratios if lives are valued at some low multiple of income per capita..

Where increasing public knowledge is concerned, one option is to conduct large-scale screening for particular conditions. The cost-effectiveness of a screening program varies greatly with the prevalence of a condition and with the frequency with which individuals are tested. For example, in Latin America and the Caribbean, screening for type 2 diabetes in the general population is estimated to cost US$ 8,550 per quality adjusted life year (QALY) gained, more than any of the other preventive or treatment interventions (Narayan *et al.* 2006, Table 30.3). Cost-effectiveness ratios for clinical examination and mammography to detect breast cancer differ by a factor of more than three, depending on the type of screen, the age group examined and the frequency of screening (Brown *et al.* 2006, Table 29.5). Table 2 shows even larger variation among forms of screening for cervical cancer. Whether such efforts would repay their cost in

reduced medical treatment is uncertain, since finding more cases of disease could increase treatment. Benefits would probably appear to exceed costs only if the health gains were adequately valued. The problems of such evaluations are discussed in section IV, below.

CCT programs pursue several objectives; they are simultaneously a specific form of insurance and a means of educating beneficiaries, besides providing an income transfer. Such programs typically provide between 10 and 25 percent of households' pre-transfer consumption (Glassman, Gaarder and Todd 2006, Table 2) which limits their coverage. This substantial cost is roughly equivalent to the cost of catastrophic health care costs, as discussed above, if *all* the beneficiaries suffered financial catastrophe regularly. For this reason CCT programs can be a valuable adjunct to, but not a substitute for, universal coverage of a wide range of health services. The marginal cost of their educational component is of course much smaller, but that component would probably not be taken up, or would be relatively ineffective, if it were not accompanied by the income transfer and the free provision of care.

IV. Benefits from the proposed solutions

One can distinguish at least three kinds of benefits as a consequence of expanded insurance coverage and improved knowledge, quality and efficiency. These are better health status, higher incomes as a direct or indirect result of that status, and financial protection. The income effect is not considered here, but may be substantial particularly in the long run, as better child health and a program to pay poor parents to keep their children in school translate into more schooling and eventual higher productivity. The shorter-run impacts on income from improved adult health are real enough, but data on

health outcomes are generally too scarce and too difficult to attribute to specific solutions. (Health improvements leading to income gains can often be attributed to specific health interventions, but not so readily to the more general solutions considered here.) Moreover, improvements beyond working age will have little or no effect on income.

IV.1 ***Prior estimates of benefits, and their limitations***

Defining health challenges and solutions in systemic rather than primarily in disease-specific terms has a cost. As the experience of the 2004 Consensus exercise shows, it is harder and more controversial to derive plausible, readily accepted estimates of the benefits from systemic changes. However, there are serious problems with the estimates of benefits, and therefore of benefit/cost ratios, from the disease-specific solutions analyzed in that exercise. Two different approaches were used, but neither is an adequate representation of the monetary value of benefits, and in addition, the two methods are not comparable.

The analysis in chapter 2 of the 2004 volume took DCP2 estimates of the healthy life years (DALYs) saved by the solution interventions, and then valued those life years at different arbitrary monetary amounts to convert them to estimated monetary benefits. The resulting benefit-cost ratio (BCR) is just the dollar value attributed to a DALY, divided by the cost-effectiveness ratio (CER):

Benefit / Cost = ($Benefit / DALY) / ($Cost / DALY) (1)

This approach makes the BCR inversely proportional to the CER, or strictly proportional to the number of DALYs that a given sum of money can buy. It does not add any real information to the cost-effectiveness estimates, since the value assigned to a DALY is not

supported by any independent evidence but is taken to be a multiple of income per capita.. The same technique is used to value the health benefits of safe water (chapter 9), and also by Jamison (2007) for several diseases.

In contrast, chapter 7 measures the benefits of better child nutrition only as subsequent increased income, directly as work effort or indirectly through schooling. One member of the Expert Panel (Frey 2004, p. 615) noted that these two approaches are not comparable, and criticized estimates based on productivity for neglecting the utility or happiness component of better health. Self-reported health turns out to be the strongest determinant of happiness, across a sample of 15,209 survey respondents in Latin America (Graham 2007). Income is only the second most important determinant. Another member of the Panel (Schelling 2004, p. 627) argued strongly against valuing life by productivity, or valuing healthy life years relative to income per capita. So although the Panel agreed on the ranking of solutions, one or another member dismissed as invalid both of the principal approaches to judging health benefits. Therefore neither of them is accepted in the present discussion of benefits.

Discarding the calculation in equation (1) means that the findings and recommendations become impossible to compare to the benefits attributed to solving other, non-health challenges, as the Consensus exercise seeks to do. Techniques of evaluation that sometimes work reasonably well for setting priorities within one sector break down when applied across different sectors (Rivlin 1971). What follows is a discussion of two outcomes of the Colombian reform, increased financial protection and improved access to health care. The results are quantitative, but are not converted to

monetary estimates of benefits to compare to the cost estimates in section III, above. (The author believes, but cannot prove, that the benefits exceed the costs.)

IV.2 *Financial protection*

The Colombian reform has dramatically changed the expenditure shares from households, enterprises and the different levels of government, as Table 7 shows. Households used to pay more than half the total cost of health care, and most of that (44 percent) was out of pocket. OOP spending has declined to only about one-fourth of the 1993 level, while total expenditure has risen by 50 percent. And the reform has succeeded in reaching the poorest households preferentially. Insurance coverage, including private voluntary insurance, went from 9 to 48 percent in the lowest income quintile and from 60 to 81 percent in the top quintile, narrowing the disparities across the income distribution (Pinto and Hsiao 2007, Figure 6.7). Coverage is still slightly worse in rural than in urban areas (by about 10 percentage points), but the subsidized regime accounts for a much larger share of beneficiaries in rural areas.

The declining share of health spending by households has been balanced by an increase in public spending, particularly a near doubling of the national government's percentage contribution and a near tripling in absolute amount. This has also relieved the departmental and municipal governments of some of their share, under rules designed to spread the geographic burden more equitably. Spending by enterprises has increased by 52 percent, keeping the share nearly constant. The other large shift is that "resources of the agents"—the intermediaries that operate the insurance—rose from 0.8 to 19.8 percent of the total. It is not entirely clear what this contribution represents (Jaramillo 2007).

This shift away from OOP financing has greatly reduced financial risk for households. When the reform was only a few years old, in 1997, the survey reported in Table 3 shows 6.7 percent of households making catastrophic payments for health on the WHO definition (40 percent or more of disposable or non-subsistence income). The catastrophic part of these payments amounted to 8.8 percent of total expenditure among those households. By 2003, only 3 percent of all households had to spend that much of their disposable income. Taking "catstrophic" to mean any share beyond 10 percent of non-subsistence spending, a high financial risk faced 10 percent of all households, or 28 percent of all those that actually had medical expenses, as Table 8 shows. These data combine the insured with the uninsured: when those two groups are compared directly, in Table 9, enrolment leads to consistently much lower likelihood of catastrophic spending. The most striking results are the relatively small difference for those enrolled in, or eligible for, the subsidized regime, and the much larger effect among the self-employed and informal workers in, or eligible for, the contributory regime. One might expect the reverse—that insurance would make the largest difference in the subsidized regime. That effect appears to be counterbalanced by the lower probability that a household eligible for that regime but not enrolled in it, would actually use medical services at all. This is a reminder that catastrophic spending occurs only among those who actually obtain care. The deterrent effect of potentially catastrophic cost on utilization is not captured.

How should one value this massive redistribution of financial burden ? Clearly there is a welfare gain every time a *peso* that would have meant catastrophic spending fro a household is instead paid by some form of prepayment. If utility is assumed to be proportional to a power function of income or consumption beyond subsistence, $U \sim C^{\beta}$,

where $\beta < 1.0$, then a household with extra-subsistence consumption C that is relieved of OOP spending by the insurance sees its welfare rise from $(C\text{-}OOP)^{\beta}$ to C^{β}, quite aside from any long-term effects from how that spending is financed. Income of around US$ 1000, leaving C at some US$ 200, and OOP spending of 10 percent of income or 40 percent of C (as is typical for catastrophic spending, according to Table 3), with a value of $\beta = 0.5$ implies that the welfare gain is of the order of 12 percent. A taxpayer or contributor who pays a premium of 12 percent on an income closer to the national average of around US$ 2,000, and contributes one percentage point to the subsidized regime, suffers a loss of only US$ 20 (because the other 11 percent buys his own insurance). His welfare loss, assuming the same subsistence cost of US$ 800, is then only one percent in purely monetary terms. Values of β closer to 1.0 reduce this difference but do not eliminate it.

What these welfare assumptions are worth in monetary terms—that is, how welfare should be valued relative to income—is of course arbitrary. What is worth emphasizing is that on any assumption that welfare increases less than proportionally to income, and that the better-off contribute only a fraction of what they pay for health to subsidize the worse-off, the benefit of the redistribution may be quite large enough to compensate the extra social cost of expanding coverage. This simple exercise does not even take account of the welfare benefit both the contributor and the subsidized beneficiary obtain simply from knowing they are protected from financial catastrophe. .

IV.3 *Improved health access and outcomes*

The expansion of health insurance in Colombia increased the monetary value of health services delivered by about 11 percent. Since this increase was concentrated

among the poorest and the formerly unprotected, it is reasonable to suppose that the effect on health status was larger than if utilization had increased in that proportion across the whole population. Table 10 compares access and utilization in 2005 between the insured (including all those already insured before the 1993 reform) and the still uninsured. The former are better off by every measure but one, although the differences are small where coverage was already high, notably for attended births. The most striking differences occur for outpatient visits, including specifically for children with particular symptoms. Table 11 shows how several indicators of utilization have changed since 1995, in both urban and rural areas. With one exception, increases have been larger in rural areas, since that is where the uninsured were a larger share of the population. The one respect in which the insured appear worse off is that because of their increased demand, they more often failed to get care because of supply constraints. Simply increasing demand without guaranteeing an adequate supply response can endanger the quality of care and discourage patients. This is a major issue for CCT programs, which sometimes incorporate specific measures to bolster supply or capacity before enrolling beneficiaries.

It is much easier to measure what happened to utilization than to translate those changes into reduced mortality, illness or disability. It would be possible, however, to estimate the likely health improvement from several of the indicators of services use, if these were combined with estimates of risk from not getting care. For example, complete immunization coverage increased slightly, and that must have prevented some cases of disease, particularly since immunization levels are far from high enough to provide herd immunity. The effect is reduced by the elimination of polio and the sharp reduction in

measles incidence throughout Latin America and the Caribbean during the same period that the reform was implemented. Immunization only against measles, mumps and rubella (MMR) increased from 82 to 89 percent between 1990 and 2006, and several other indicators improved markedly, as Table 12 shows. These data do not say what share of the improvement can be attributed to the expansion of coverage, but so much change is implausible in the absence of increased access and reduced financial burden.

The various CCT programs in Latin America, including the one in Colombia, have been subjected to fairly detailed evaluation, so the impact on utilization can be attributed with more confidence to the program. Visits to public clinics for children under age two increased by 30 percent among beneficiaries; in the age group 2-4, the increase was 50 percent (Glassman, Gaarder and Todd 2006, Table 5). These changes are larger than the differences between the insured and uninsured in Table 11—but the CCT beneficiaries may be drawn predominantly from the newly-insured, and the age group for the latter is not specified. It appears that impacts have been systematically greater among those initially worse off, as might be expected.

This paper does not try to put a dollar value on these gains, but an extension of life expectancy by 4.5 years would, on any full-income calculation or valuation of an extra year of life, be worth a great deal. This effect, plus the benefits of the dramatic increase in financial protection that result from expanded coverage, appear quite large enough to justify the costs involved. Generalization to other countries that are farther from achieving universal coverage would require calculation of their own costs and probable benefits, and might show better or worse results. The qualitative conclusion that these solutions offer benefits in excess of their costs is likely to remain valid.

V. Conclusions

This way of posing the challenges and suggesting solutions does not lead to clear benefit-cost comparisons. The crucial solution to the health challenges of Latin America and the Caribbean is to extend insurance coverage to the whole population where that is not already the case, with a benefit package that includes catastrophic care and allows considerable choice of provider, and with financing that implies affordable premiums for some beneficiaries and complete subsidy for others, on the basis of income rather than any demographic characteristic. A reform of that sort, of whatever specific model, does not guarantee higher quality or efficiency in the delivery of health care, but it probably facilitates simultaneous reforms pursuing those ends. It most definitely will improve access, particularly by removing financial barriers—and to a lesser extent, also physical barriers of time and distance. Including a conditional cash transfer program to boost demand for care among the poor may complement the general extension of coverage, particularly for the preventive services for which such programs are best suited and for which the income gradient in utilization is steepest.

There is no conflict between this way of stating and confronting challenges to health, and the way followed in pervious Copenhagen Consensus exercises. One approach looks at what changes are needed in the health system so that it can deliver quality care to the whole population. The other looks at what diseases, conditions and risk factors the system should try especially to control. Without a well-functioning system, efforts against specific health problems will be less effective than they could be; without sensible priorities, even a well-run system will waste resources and opportunities. Where the two approaches meet is in the definition of an affordable, cost-

effective package of benefits for the system to deliver, and a mechanism to assure that the package reaches as much of the population as possible..

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Table 1. Deaths and Disease Burden by Cause—Latin America and the Caribbean, 2001

	LAC		LMI	
	Deaths (000s)	**DALYs (000s)**	**Deaths (000s)**	**DALYs (000s)**
All Causes	**3,277**	**104,287**	**48,351**	**1,386,709**
I. Communicable Diseases, Maternal and Perinatal Conditions and Nutritional Deficiencies	**716 (21.8)**	**22,741 (21.8)**	**17,613 (36.4)**	**552,376 (39.8)**
Tuberculosis	45 (1.4)	966 (0.9)	1,590 (3.3)	35,874 (2.6)
HIV/AIDS	83 (2.5)	2,354 (2.3)	2,552 (5.3)	70,796 (5.1)
Diarrheal diseases	55 (1.7)	2,362 (2.3)	1,777 (3.7)	58,697 (4.2)
Measles	0 (0.0)	0 (0.00)	762 (1.6)	23,091 (1.7)
Malaria	2 (<0.1)	111 (0.1)	1,207 (2.5)	39,961 (2.9)
Lower respiratory infections	157 (4.8)	3,043 (2.9)	3,408 (7.0)	83,606 (6.0)
Perinatal conditions	164 (5.0)	6,296 (6.0)	2,489 (5.1)	89,068 (6.4)
Protein-energy malnutrition	37 (1.1)	1,558 (1.5)	241 (0.5)	15,449 (1.1)
IV. Non-Communicable Diseases	**2,187 (66.7)**	**67,815 (65.0)**	**26,023 (53.8)**	**678,483 (48.9)**
Stomach cancers	57 (1.7)	735 (0.7)	696 (1.4)	9,616 (0.7)
Colon and rectum cancers	37 (1.1)	485 (0.5)	357 (0.7)	5,060 (0.4)
LIVer cancer	21 (0.6)	277 (0.3)	505 (1.0)	7,945 (0.6)
Trachea, bronchus, and lung cancers	55 (1.7)	728 (0.7)	771 (1.6)	10,701 (0.8)
Diabetes mellitus	163 (5.0)	2,775 (2.7)	757 (1.6)	15,804 (1.1)
Unipolar depressIVe disorders	0 (0.0)	5,219 (5.0)	10 (<0.1)	43,427 (3.1)
Alcohol use disorders	17 (0.5)	2,883 (2.8)	62 (0.1)	11,007 (0.8)
Cataracts	0 (0.0)	1,813 (1.7)	0 (0.0)	28,150 (2.0)
Vision disorders, age-related	0 (0.0)	1,639 (1.6)	0 (0.0)	15,364 (1.1)
Hearing loss, adult onset	0 (0.0)	1,706 (1.6)	0 (0.0)	24,607 (1.8)
HypertensIVe heart disease	87 (2.7)	1,052(1.0)	760 (1.6)	9,969 (0.7)
Ischemic heart disease	358 (10.9)	4,328 (4.2)	5,699 (11.8)	71,882 (5.2)
Cerebrovascular disease	267 (8.1)	3.936 (3.8)	4,608 (9.5)	62,669 (4.5)
Chronic obstructIVe pulmonary disease	99 (3.0)	2,037 (2.0)	2,378 (4.9)	33,453 (2.4)
Cirrhosis of the lIVer	74 (2.3)	1,513 (1.5)	654 (1.4)	13,633 (1.0)
Nephritis and nephrosis	55 (1.7)	769 (0.7)	552 (1.1)	9,076 (0.7)
Osteoarthritis	1 (<0.1)	1,283 (1.2)	2 (<.01)	13,666 (1.0)
Congenital anomalies	47 (1.4)	2,460 (2.4)	477 (1.0)	23,533 (1.7)
Alzheimer and other dementias	14 (0.4)	1,215 (1.2)	173 (0.4)	9,640 (0.7)
I. Injuries	**374 (11.4)**	**13,731 (13.2)**	**4,715 (9.8)**	**155,850 (11.2)**
Road traffic accidents	88 (2.7)	2,686 (2.6)	1,069 (2.2)	32,017 (2.3)
Falls	15 (0.5)	729 (0.7)	316 (0.7)	13,58 2(1.0)
Self-inflicted injuries	30 (0.9)	711 (0.7)	749 (1.5)	17,67 4(1.3)
Violence	130 (4.0)	5,154 (4.9)	532 (1.1)	18,13 2(1.3)

Source: Lopez *et al.* (2006), Tables 1.1, 3.B.4 and 3.C.4

Notes: Numbers in parentheses indicate percentages of column totals. Only selected causes are shown in each grouping I, IV and I, so group totals exceed the sum of the selected causes.

Table 2. Economic Outcomes of Once-in-a-Lifetime Cervical Cancer Screening, Brazil

Type of screen	None	1-Vsivt VIA	2-Visit HPV DNA Testing	3-Visit Cytology
Lifetime cost (I$)	68.41	75.08	77.43	121.12
CER (I$/YLS)	n.a.	113	155	1,430
CER (US$/YLS)	n.a..	54	118	572
Per 1 million women screened:	n.a.			
Deaths averted	n.a.	10,399	10,235	6,411
Life expectancy gain (years)	n.a.	59,100	58,200	36,900
DALYs saved	n.a.	56,646	55,751	35,174

Source: DCP2 Table 29.3. CER, cost-effectiveness ratio; YLS, years of life save; n.a., not applicable; CER is estimated relative to no screening..

Table 3: Out-of-pocket (OOP) and catastrophic health spending in selected Latin American and Caribbean countries, ca. 1992-2002										
Country	**Year**	**All households**			**Only households with catastrophic expenditure**					
		OOP as % expenditure		**Subsistence spending per capita (national currency)**	**OOP per capita**	**As % of all households**		**OOP as % total OOP in whole sample**	**OOP as % household spending**	**Catastrophic as % household spending**
		Total	**Non-subsistence**			**Mean**	**95% CI**			
Argentina	1996/7	5.8	8.6	170	191	6.2	5.9-6.5	35.5	40.3	13.0
Bolivia	1999	3.2	5.3	294	562	4.7	3.9-5.4	55.8	39.9	13.6
Bolivia	2000	2.9	5.1	290	400	6.1	5.4-6.7	45.1	36.6	12.9
Bolivia	2001	3.6	6.5	313	90	3.4	3.0-3.9	49.1	34.1	11.4
Bolivia	2002	3.8	6.8	333	433	3.7	3.3-4.2	48.4	37.0	13.1
Brazil	1996	7.5	13.0	78	86	10.3	9.4-11.1	38.8	33.6	11.4
Colombia	1997	6.1	10.3	110956	81797	6.7	6.2-7.2	25.1	31.8	8.8
Costa Rica	1992	0.8	1.4	9455	4070	0.2	0.0-0.3	3.2	22.0	9.0
Guyana	1992	1.9	3.7	5166	2414	0.7	0.3-1.2	6.6	27.4	6.6
Jamaica	1997	2.3	5.0	4818	1526	1.1	0.6-1.5	7.6	25.3	6.3
Jamaica	2001	2.9	5.3	5255	4092	1.1	0.6-1.6	10.6	31.8	9.0
Mexico	1996	2.9	4.4	348	606	1.6	1.4-1.8	24.1	37.6	9.5
Nicaragua	1993	4.8	12.7	610	231	2.2	1.8-2.7	44.1	23.9	8.2
Nicaragua	1998	3.0	5.3	291	460	9.4	8.5-10.3	33.6	37.5	10.7
Panama	1997	3.6	6.3	111	82	2.8	2.3-3.2	18.2	32.9	12.8
Paraguay	1996	3.8	6.9	312371	358243	3.8	3.1-4.6	29.9	35.6	10.6
Paraguay	2000/1	5.0	9.7	240220	164928	3.2	2.5-3.9	19.1	30.1	9.0
Peru	1994	4.0	7.4	196	142	3.3	2.8-3.9	26.0	31.5	8.4
Peru	2000	2.9	5.0	266	361	3.8	3.2-4.4	46.6	36.1	11.8
Uruguay	1995	4.1	5.3	863	1013	0.8	0.5-1.1	5.5	37.3	8.5

Source: Xu *et al.* 2007, Appendix 1, and additional calculations in personal communications from Ke Xu, 28 and 30 May 2007. Survey identification is provided in the source.

Table 4. Indicators (percentages) of medical attention for individuals reporting chronic health problems, Brazil, 1997

	Income quintile					
Indicator of attention	**1**	**2**	**3**	**4**	**5**	**Total**
Consulted a professional	54.7	63.3	70.3	78.9	82.9	71.1
Among those who did consult:						
Follow-up visit with same professional	51.7	58.8	65.7	73.0	80.7	68.3
Periodic check-ups for the problem	60.9	65.3	70.3	77.6	82.5	73.1

Source: Campino *et al.* 2001, Table 7.

Table 5: Arc price elasticities for health care demand in rural Peru, 1985-86

	Adults, by income quartile				Children, by income quartile			
Fee (1985 Intis)	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**
Private doctor								
0-10	-0.53	-0.36	-0.15	-0.00	-0.20	-0.16	-0.13	-.006
10-20	-0.91	-0.62	-0.25	-0.02	-0.38	-0.36	-0.27	-0.12
20-30	-1.30	-0.87	-0.36	-0.03	-0.84	-0.66	-0.48	-0.20
Public hospital								
0-10	-0.57	-0.38	-0.16	-0.01	-0.67	-0.48	-0.22	-0.03
10-20	-0.96	-0.64	-0.26	-0.02	-1.18	-0.83	-0.38	-0.05
20-30	-1.36	-0.91	-0.37	-0.04	-1.72	-1.20	-0.54	-0.09
Public clinic								
0-10	-0.31	-0.21	-0.08	-0.00	-0.76	-0.53	-0.24	-0.03
10-20	-0.61	-0.40	-0.15	-0.01	-1.28	-0.89	-0.41	-0.06
20-30	-0.95	-0.61	-0.23	-0.02	-1.80	-1.26	-0.57	-0.10
Mean income	395	783	1,267	2,620	395	783	1,267	2,620

Source: Gertler and van der Gaag 2002, Tables 6-9 and 6-10.

Table 6: Percentage of Prenatal Care Procedures Performed, by Clinical Setting, Rural Mexico 2003

Procedure	Social Security	IMSS Oportunidades	MOH, Other public	Private sector	All settings
Asked about bleeding	82.24	78.26	74.40	57.01	72.28
Asked about discharge	85.34	80.71	75.71	60.36	74.44
Blood sample taken	61.21	44.02	46.12	31.79	45.23
Urine sample taken	68.79	49.46	50.27	34.36	49.73
Blood pressure taken	95.00	94.57	94.80	73.23	90.09
Weighed	97.93	98.10	97.98	75.16	92.99
Uterine height measured	90.00	89.95	88.24	61.78	82.92
Pelvic exam	51.21	42.93	48.80	35.26	45.62
Tetanus toxoid immunization	94.48	97.28	94.26	70.14	89.33
Iron supplements	90.52	88.86	85.12	65.89	82.18
Advised about lactation	92.21	92.93	91.30	71.04	87.19
Advised about family planning	90.17	91.85	85.72	55.21	80.41
Recorded information	80.00	83.15	77.08	43.24	70.79

Source: Barber *et al.* 2007, Exhibit 2. (Sample size 3,553 women)

Table 7: Absolute amounts and percentage share of total health spending, Colombia, 1993 and 2003

Source (payer)	1993		2003	
	Mln constant 2000 pesos	Percent	Mln constant 2000 pesos	Percent
Households	5,215,434	54.9	4,088,280	28.6
Voluntary insurance	344,184	3.6	749,144	5.2
Mandatory insurance	0	0	63,260	0.4
Social security tax	726,623	7.7	1,923,345	13.5
Copayments, etc.	0	0	127,653	0.9
Out of pocket (OOP)	4,144,626	43.7	1,071,964	7.5
Enterprises	2,150,734	22.7	3,268,302	22.9
Private insurance	355,143	3.7	205,917	1.4
Mandatory insurance	0	0	46,072	0.3
Social security tax	1,443,381	15.2	2,349,444	16.5
Other taxes	352,211	3.7	666,869	4.7
Public sector	2,046,476	21.6	4,080.276	28.6
National government	1,129,068	11.9	3,228,452	22.6
Departments	758,872	8.0	574,085	4.0
Municipalities	158,537	1.7	277,789	1.9
Total	9,494,096	100.0	14,270,063	100.0

Source: Barón 2007, Cuadro A.5. The item, "resources of the agents (insurance intermediaries)" is omitted but its value is included in the total.

Table 8. Incidence of Catastrophic Expenditure by Income Quintile, Colombia, 2003

	Percentage of Households with Catastrophic Spending (Threshold of 10 % or more of Disposable Income)	
Income Quintile	**All Households**	**Only those that used services**
1 (poorest)	12	41
2	12	38
3	9	25
4	7	19
5 (richest)	6	19
Total Population	10	28

Source: Escobar *et al.* 2007, Table 3.

Table 9. Impact of Insurance (Difference in Probability) of Catastrophic Spending and Impoverishment, Colombia, 2003

Insurance Regime	Catastrophic spending		Impoverishment below National Poverty Line
	10% threshold	40% threshold	
Subsidized	-21%	-4%	-4.00%
Contributory			
Salaried (Dependent) Worker	-40%	(*)	(*)
Self-Employed, Informal	-71%	-8%	-3.35%

Source: Escobar *et al.* 2007, Table 4. (*) Not significantly different from zero.

Table 10. Indicators of access and utilization by insurance status, Colombia, 2005 (Percent).

Indicator, access or utilization	Mean, un-insured	Mean, insured	Absolute Difference	Percent difference
Received medical care when needed	54.3	73.9	19.6	+36
Not receiving care for supply reasons	13.2	30.4	17.2	+130
Not receiving care for financial reasons	56.9	23.8	-33.1	-58
Outpatient visit, last 12 months	46.2	68.2	22.0	+48
Child immunization complete	37.4	41.8	4.4	+12
Child taken to health facility with coughing	35.7	44.8	9.1	+26
Child taken to health facility with diarrhea	29.4	35.5	6.1	+21
Number of prenatal visits (not percent)	*5.19*	*5.39*	*0.2*	*+4*
Birth in a health facility	83.2	85.8	2.5	+3
Birth attended by a professional	81.3	84.7	3.5	+4
Birth attended by a doctor	76.5	80.0	3.5	+5
Control after delIVery	47.0	52.1	5.2	+11
Access to care for complications of delIVery	42.3	48.8	6.5	+15

Source: adapted from Giedión *et al.* 2007, Table 1.

Table 11. Changes in percent utilization, Colombia, 1999-2005

Utilization variable	National	Urban	Rural
Child immunization complete	6.1	4.1	11.8
Child taken to health facility with coughing	10.7	9.0	7.8
Child taken to health facility with diarrhea	7.4	9.9	15.1
Number of prenatal visits (not percent)	*0.42*	*0.17*	*0.39*
Birth in a health facility	4.3	0.9	4.7
Birth attended by a professional	5.1	0.7	4.4
Birth attended by a doctor	5.7	0.8	6.2

Source: adapted from Giedión *et al.* 2007, Table 2.

Table 12. Public health indicators before and after reform, Colombia, 1990-2006

Indicator	Ca. 1990	Ca. 2006
Unmet basic needs (% of population lacking at least one of clean water, sewerage, etc).	35.8	27.6
Life expectancy at birth (years)	68.3	72.8
Infant mortality rate (per thousand live births)	26.3	17.2
Under-five mortality rate (per thousand)	34.7	21.4
Births attended by a professional	81.8	96.4
MMR immunization (children aged 12-23 months	82.0	89.0

Source: Glassman *et al.* 2007, Table 1.