

# Health Policy in Poor Countries: Weak Links in the Chain

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**Abstract** There is broad consensus that a mix of public health, preventive and simple curative activities provided through low-level facilities is the right policy for public expenditures on health in developing countries. Yet this near unanimous consensus is in sharp contrast to a mixed record in practice and consistent disappointment in implementation. We show how the recent theoretical and empirical literature on the economics of health sheds light on both the disappointment and the consensus by emphasizing various links in the entire chain of events from public spending to health status. First, incorporating the analysis of the health seeking behavior of individuals can completely change conclusions about the appropriate role for, and the expected impact of, public sector interventions. Second, highlighting the key role of providers' incentives in determining the actual efficacy and quality with which the consensus around something like primary health care (PHC) is implemented also changes the expectation of effectiveness of public interventions. Both aspects emphasize the deep difficulties encountered with bringing incentives, whether for suppliers or for users, to bear on the delivery of PHC.

*The findings, interpretations, and conclusions expressed in this paper are entirely those of the authors. They do not necessarily represent the views of the World Bank, its Executive Directors, or the countries they represent. This paper grew out of an earlier collaboration between the authors and Maureen Lewis and Samuel Lieberman. We would like to thank Martin Ravallion and Susan Stout for helpful discussions. Comments are welcome.*

## Health Policy in Poor Countries: Weak Links in the Chain

### ***Introduction***

Arguments for “primary health care” (PHC) are very appealing as the problems it addresses are pressing and the solution it provides seems obvious. In 1995 over 9 million children under five in developing countries died avoidable deaths; more than the entire population of Sweden or of Zambia.<sup>1</sup> There are developing countries whose budget is principally absorbed by public hospitals staffed by extensively trained (at public expense) doctors using expensive medical technologies to treat conditions of the urban elite, while in those same countries children die from diseases that could have been treated for a few cents or avoided altogether with basic hygienic practices. Yet there are examples of success. Kerala, a state in India with income per capita of only \$1254<sup>2</sup> has infant mortality of only 31 (per thousand live births), which is not only forty percent lower than that in Punjab, another Indian state with twice the income, but is 35 percent lower than that in Brazil, with over four times the per capita income. Infant mortality in Shanghai is lower than that of Manhattan and the recorded infant mortality rate in Jamaica of 16 is lower than that of African-Americans in the United States. Ceara, one of the poorest states in Brazil reduced infant mortality by 36 percent

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<sup>1</sup> “Avoidable” deaths are defined as the excess of the average death rate for the 0-5 age group in the low- and middle-income countries of 88 per 1000 versus the level in the high-income countries, 9. Using a comparable approach Gwatkin (1980) calculated the total number of deaths of under fives to be about 15 million.

<sup>2</sup> Income is in 1995 international dollars which are adjusted for purchasing power differences.

in just a few years through an aggressive government program (Tendler and Freedheim, 1994).

This combination of experiences has led to a strong two-fold consensus on health policy in the poorest countries.<sup>3</sup> First, economic progress is not enough and governments can, and should, act to improve health. Second, the existing allocation of health expenditures towards curative care in tertiary facilities is inappropriate and a reorientation of government efforts towards PHC would bring both health gains and cost savings. In this consensus PHC is typically defined expansively. PHC could be defined by what it is not: it is neither secondary nor tertiary curative care, but all other activities related to health, from nutrition to sanitation. Even more ambitious definitions view PHC as a part of social revolution (Decosas 1990). For our purposes we will treat PHC as composed of three (at least conceptually) distinct elements: simple *curative* care usually based in “primary” facilities, *preventive* activities aimed at health improvement especially those based on community health workers, and finally more traditional *public health* campaigns.<sup>4,5</sup>

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<sup>3</sup> The current debates on health care reform in the developed countries, and in the upper middle income countries with similar health profiles, such as Eastern Europe and the richer parts of South America are rightly focused on completely different issues. In those countries, the epidemiological profile of mortality and morbidity more towards non-infectious diseases of adulthood, such as heart disease and cancers, which have high, and highly skewed treatment costs per episode. This lends to a greater focus aggregate cost containment, relationships between medical innovations and costs, and relationships between patient, provider and payment.

<sup>4</sup> These are similar to the “promotive, preventive, curative, and rehabilitative services” of the Alma Ata declaration (WHO, 1988).

<sup>5</sup> Many see a “basic package of cost-effective interventions” advocated by some at the World Bank (Bobadilla and Saxenian, 1993) as a minor variant on PHC. This is not exactly true, as the technique of “medical intervention cost effectiveness” (MICE) has two differences with PHC. First, at least in theory the level of facility does not matter as high MICE interventions could occur in secondary or tertiary facilities. Second, MICE analysis is also claimed to be useful as a technique for cost containment in higher income contexts where PHC is less relevant. The

While the images and statistics that motivate PHC are compelling, the gains have rarely been demonstrated in practice. Although there have been huge successes from individual campaigns under a PHC banner including various immunization campaigns, or the recent campaign against river blindness, the data often show very little impact of PHC. The implementation of PHC has created a new set of images. Empty rural health clinics without drugs or working equipment. The sick bypassing free primary public clinics to pay for services from private providers. This disappointing experience of raises the question: what was missing from the seemingly compelling logic? We believe economists bring two perspectives that are useful for understanding, and perhaps improving, the implementation of health policy: choices and incentives.

First, too often the impact of PHC was calculated as if health status were entirely a technocratic affair and individuals were the passive recipients of government action. But individuals actively use their knowledge and resources to enhance their own (and their children's) health. Incorporating choices into the analysis can completely change both the expected impact of PHC and the ranking of the importance of various actions. The impact of PHC cannot be assessed from medical knowledge, but depends both on how it impacts on the demand for services and on how it interacts with the existing (and potential) supply and prices in the private sector.

Second, PHC advocates often assumed the public sector could be made to deliver whatever was decided in the capital (or at an international forum in someone else's capital)

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problems with MICE as a tool for public policy are serious but addressed elsewhere (Hammer and Pritchett, 1997).

ought to be delivered. In practice, the quality of public sector health services has ranged from excellent to truly horrific. While an idealized, well run network of community workers and rural health clinics might have a dramatic impact on health status, the real issue is the impact of the services a country's public sector is actually capable of providing. Public sector failures in health are not just random but are results of a systemic mismatch between the incentive structure in the traditional civil service mode of public sector organization and tasks in the health sector.

The paper is organized as follows. Section 1 presents a simple framework to organize the literature. Section 2 reviews the cross-country evidence on the small impact of public spending and discusses whether this is only because public monies have been spent on the wrong type of services. The subsequent sections take up possible explanations of the impact of PHC. Section 3 discusses the organizational structure of the public sector in health and how it might lead to public spending creating ineffective services. Section 4 discusses how public and private interactions might mitigate the impact of public intervention. Section 5 looks at the role PHC might have in the presence of market failures and in the context of the links between poverty and health.

### ***D) A simple framework for analyzing the literature***

We start with a very simple story of individual maximizing behavior, one which motivates a chain of reasoning about the potential impact of public spending on health. Suppose an individual has an exogenously given total resources ( $Y$ ) and level of knowledge ( $E$ ), and his or her well being is determined by health status ( $HS$ ) and the consumption of all

other goods ( $X$ ), whose price we normalize to 1. Suppose that health status is produced from two health inputs,  $H_1$  and  $H_2$  whose prices are  $p_1$  and  $p_2$  (the prices include not just money cost but all resources sacrificed) and whose effect is conditioned by the individual's knowledge ( $E$ ). The individual's choice problem is to choose the levels of consumption to maximize their welfare subject to the budget constraint and the health production function:

$$\begin{aligned}
 & \text{Maximize } U(X, HS) \\
 & \text{with respect to } X, H_1, H_2 \\
 & \text{subject to:} \\
 & X + p_1 \times H_1 + p_2 \times H_2 = Y \\
 & \text{and} \\
 & HS = HS(H_1, H_2; E)
 \end{aligned}$$

The individuals' solution to this problem gives the optimal consumption levels,  $X^*$ ,  $H_1^*$  and  $H_2^*$ . Substituting those into the health production function gives the individuals' health status as a function of their income, knowledge, and the relative prices of the health goods,  $HS^*(Y, E, p_1, p_2)$  (where "\*" represents the optimal quantity).

There are three questions that the literature has addressed: one positive, one normative, one practical. The first is, how big is the effect of any given type of public spending on health ( $d HS^*/d PS$ )? The normative question is, if a benevolent dictator were trying to maximize health status using the allocation of a fixed budget, how should she allocate public spending?<sup>6</sup>

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<sup>6</sup> Along with the nearly all of the rest of the literature, we assume a fixed budget and avoid the problem of maximizing *welfare* as that would endogenize the budget and require valuing

The third, and most important, is the practical question: what should be done? Our simple framework helps us organize these questions. Public spending influences health status by lowering the effective price of health enhancing inputs. How it does so depends on four distinct mechanisms, which can be expressed as a chain of partial impacts that lead from public expenditures to improvement in health:

$$\begin{aligned} \frac{d HS^*}{d PS} &= \frac{\partial HS^*}{\partial H_1^*} \times \frac{\partial H_1^*}{\partial Q_1^{PS}} \times \frac{\partial Q_1^{PS}}{\partial PS_1} \times \frac{\partial PS_1}{\partial PS} \\ &+ \frac{\partial HS^*}{\partial H_2^*} \times \frac{\partial H_2^*}{\partial Q_2^{PS}} \times \frac{\partial Q_2^{PS}}{\partial PS_2} \times \frac{\partial PS_2}{\partial PS} \\ &+ \textit{indirect and cross-effect terms} \end{aligned}$$

1)  $\partial PS_i / \partial PS$ : *Composition of public spending*. The impact of an increase in total public spending on health will depend on how that increase is allocated across health inputs. An equi-proportionate increase in spending on all inputs will have a very different impact than one which increased only the most effective public interventions.

2)  $\partial Q_i^{PS} / \partial PS_i$ : *Public sector efficacy*. Even when money is spent, the question is whether it creates effective health services, and in what magnitude. When a government decides to build a clinic, or spray for malaria, or mobilize community outreach workers, or buy X-ray machines, it can be more or less effective at translating that expenditure into a real supply of services. This efficacy will have both a country specific component common to all activities,

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health versus non-health goods.

but also an activity specific component, as government might be more or less well adapted to certain activities.

3)  $\partial H_i / \partial Q_i^{PS}$ : *Net impact on use of services of public sector supply.* Even if public sector expenditures do create a supply, the next question is how this expansion translates into a change in the effective price faced by consumers. Even if a particular health service is “cost effective” in improving health, this does not mean that *public spending* on that service would be cost effective in improving health, as additional consumption in the public sector occasioned by public supply may well simply crowd out, in whole or part, equally effective services obtained from non-government providers. The size of this effect will depend on the responsiveness of individuals’ demand, and private suppliers’ supply, to changes in the price, travel time, convenience, or quality of services, induced by changes in public availability.

4)  $\partial HS^* / \partial H_i^*$  : *The Health Production Function.* Different health inputs are more or less effective in improving health in ways determined by biological and medical facts. What the health production function looks like, that is, which treatments are effective in eliminating which cancers, which vaccines are potent over what period, how micro-nutrients affect susceptibility to diseases, is what health care professionals learn. Economists typically prefer to remain agnostic about the production function particulars and in many cases sensible recommendations about *public policy* need not necessarily inquire into the production function.<sup>7</sup>

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<sup>7</sup> One prominent economist when asked what an economist needed to know about the particulars of the production function in order to make sensible policy recommendations, responded “Convexity.”

In this framework, the argument is that increases in public spending on PHC are effective in improving health status, while curative and especially secondary and tertiary curative services are not. This can rationalize an *increase* in public funds spent on PHC as well as a *reallocation* of the health budget towards PHC activities.

The argument for PHC, however, typically relies almost exclusively on the health production function (perhaps, modified to include accounting costs to generate MICE rankings). However, the actual impact of public spending is the product of all four terms in the above equations: *allocation of the budget, public sector efficacy, market impact on consumer demand for services, and health impact of services*. If any one of these is low, the total impact will be low.

## ***II) Impact of public spending and PHC on health status***

Has public spending on health, and more particularly on PHC, promoted good health? We review three strands of evidence: first, country level evidence, second, the impact of facility availability on the health status of individuals, and third, the evaluation of projects and experiments.

Mortality is easy to measure while morbidity is not and (fortunately for people but unfortunately for research) mortality (except among the very young and very old) is rare. While WHO's definition of health as "a state of complete physical, mental, and social well-being, and not merely the absence of disease or infirmity (WHO, 1988)" is attractive, it is

subjective and hard to assess.<sup>8</sup> Moreover, since death occurs rarely, and only once for each person, it is difficult to study at the household level. So while we might be interested in the totality of health over an individual's life course, empirical studies tend to focus on infant (or child) mortality or life expectancy as proxies for health status and rely on aggregate (district, province and country) comparisons.

*Country level: Aggregate spending.* Cross national studies have come to a fair consensus on two points. First, socio-economic characteristics explain nearly all of the variation in mortality rates across countries. A recent cross-national econometric study of child (under-5) mortality shows that average GDP per capita, a measure of the distribution of income, the level of female education, a dummy variable for countries predominantly Muslim, an index of ethnolinguistic diversity, and a set of five dummy variables for regions explain virtually all the variation in child mortality (Filmer and Pritchett, 1997). GDP per capita alone "explains" 80 percent of the variation in mortality and adding the other variables raises this to 95 percent. Preston (1980), in an influential paper based on data from between 1940 and the 1970 emphasized the low explanatory power of socioeconomic variables. However, more recent data and results are unanimous about the high explanatory power of socio-economic basics like average income and female education, including Preston (1986) using

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<sup>8</sup>The huge effort to create measures of Disability Adjusted Life Years (DALYs) has led to some additional information on morbidity (Murray, 1994). However, the correlation between DALYs lost and life expectancy or infant mortality is 0.93 across the eight regions for which DALYS have been calculated (World Bank, 1993).

data from between 1970 and 1980.<sup>9</sup>

Second, total public spending on health has had much less impact on average health status that one might have expected, and certainly less than hoped. Although the lack of data on public spending has, until recently, limited the direct examination of the issue, Musgrove (1996) summarizes studies of the impact of public spending on health on health status:

“[m]ultivariate estimates of the determinants of child mortality give much the same answer [as his results on life expectancy or DALY burden of disease]: income is always significant, but the health share in GDP, the public share in health spending, and the share of public spending on health in GDP never are.”

Even using instrumental variables to account for data and endogeneity problems Filmer and Pritchett (1997) find that public expenditure on health as a share of GDP is a small, and statistically insignificant, determinant of child mortality. At the point estimates *doubling* public spending from 3 to 6 percent of GDP would improve mortality by only between 9 to 13 percent (appendix Table A-1 reproduces those regressions).<sup>10</sup> Other empirical studies that add measures of health resources, such as physicians, nurses, or hospital beds per capita to the basic socio-economic variables in this type of regression rarely find large and significant impacts for these variables (Kim and Moody, 1992).

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<sup>9</sup> Some have been confused about Anand and Ravallion (1993), claiming that they showed that income was unimportant, in spite of their explicit claim otherwise. What they showed is that they could not reject the restriction that average income affected health status only insofar as it affected the level of poverty, highlighting the fact that it is increased income among the poor that is most effective in improving health. However, since the correlation between average incomes and poverty is very high this still implies average income, through its poverty reducing effects, explains most health status variation.

<sup>10</sup> Bidani and Ravallion (1997) show a large impact of public spending on the health status of the poor, but their estimated impact of public spending on aggregate health status (of the poor and non-poor taken together) was also quite small.

So far the evidence is consistent with the following argument for PHC. First, although socio-economic conditions powerfully determine health status, there are still outliers such as Kerala, Sri Lanka, Costa Rica whose achievements are potentially replicable. Second, there are simple health “interventions” that could be delivered in basic facilities that would avert a large fraction of the deaths in low income settings at very low cost, typically between \$10 and \$4000 per death averted (Jamison and others, 1993).<sup>11</sup> Third, the evidence of the low effectiveness of existing public spending, such as the finding that for the *typical* country \$50,000 to \$100,000 is spent per death averted (Filmer and Pritchett, 1997) is “proof” that reallocations of the existing public budget to PHC could lead to large health gains at no cost (or even with savings). However, while this argument appears to create a powerful *presumption* that a reallocation of the public budget towards PHC would significantly improve health status, it does not *demonstrate* this. What is the evidence?

While the existence of health “outliers” suggests possibilities, it was never very clear the success of the outliers was due to a *health* system versus *social* or *political* phenomena. A participant at a seminal conference which cemented support for PHC based on case studies of

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<sup>11</sup> The MICE literature is usefully broken into two types: bottom-up or top-down, based on the epidemiological conditions envisaged. MICE concerned with health expenditures in very low income countries is a “bottom-up” approach to building a “basic package” and tends to reinforce PHC recommendations (with some exceptions, as some hospital based clinical treatments are high MICE). MICE in high-income countries, which face an entirely different pattern of disease conditions is “top-down”: geared to limiting costs by eliminating payment for extraordinarily low MICE interventions (e.g. heart transplants in the elderly) and is of limited relevance in most low income settings.

the “outliers” commented:<sup>12</sup>

The four case studies [China, Costa Rica, Kerala state, Sri Lanka], involve societies in which low mortality has been reached without high per capita income. Situations in which low income continues to be associated with high mortality or high income is associated with high mortality were not considered, nor have we searched systematically for other societies in which relevant social characteristics of the four successful cases are repeated, to see what happened to mortality. Thus the policy prescriptions are relatively weak. (Kunstadter, 1985, p. 234)

Moreover, while the “barefoot doctors” of China are famous, it is not obvious all successes followed a “PHC” like strategy. In 1986 Sri Lanka spent 70 percent of its public monies on hospitals, substantially higher than the 56 percent average for comparable countries in South Asia (Griffin, 1992).

If the reasoning behind the recommendation of PHC-like activities is correct then there should be empirical regularities both at the aggregate and local levels. First, given the total *level* of expenditures, more spending on “PHC-like” activities and greater access to “PHC-like” services should be associated with lower mortality. Second, at the local level (household, village) we should see a positive association between greater access to health care facilities of the PHC type and lower mortality. Third, projects which create facilities should lower mortality. None of these regularities find much support in the data.

*Country level: PHC.* Table 1 reports the results of including either the share of national health expenditures that are devoted to local health services or access to local services (defined as the share of the population with local health services, including essential drug availability,

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<sup>12</sup> This was a conference sponsored by the Rockefeller Foundation whose results are documented in Halstead et al (1985).

within one hour's walk or travel) in an equation explaining child mortality.<sup>13</sup> The results in column 3 and 4 show that mortality is not significantly systematically lower where more spending is directed at local health services. The results in columns 5 and 6 show that mortality is not significantly systematically lower where populations have greater access to local health services. While it is easy (and many times correct) to dismiss cross-national regressions as definitive evidence *against* any particular claim, as the "true" variable of interest might be badly measured, it must be said that the cross national evidence has not yet been marshaled which lends *support* to PHC.<sup>14</sup>

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<sup>13</sup> This is into a cross national regression which explains under-5 mortality with income, public spending on health as a share of GDP, female education, income distribution, and other non-health related factors. A description of the data and the full set of results are in Appendix A-1.

<sup>14</sup> Two stage least squares estimation was used to address the potential problems of measurement error and reverse causation. The estimates will be biased towards zero if these variables are measured with error (this is likely as a value for 1985 is sometimes used in place of one for 1990). In addition, the estimates will be inconsistent if there is reverse causation, for example if high mortality cause a government to spend more on providing access to more local health services. See appendix Table A-1 for the instruments used.

Table 1: Selected coefficients from under-5 mortality rate (ln) regressions (1990)						
Column:	1	2	3	4	5	6
Method	OLS	2SLS	OLS	2SLS	OLS	2SLS
GDP per capita (ln)	-.611 (9.71)	-.596~ (3.67)	-.624 (8.16)	-.921~ (1.84)	-.616 (9.08)	-.829~ (2.47)
Public health exp. (Ln share of GDP)	-.135 (1.78)	-.192~ (.742)	-.165 (1.73)	-.139~ (.359)	-.085 (.931)	.146~ (.374)
Local health services (ln share of expend)			.076 (1.78)	-.359~ (.754)		
Access to local health services (ln share of pop)					-.024~ (.227)	.336~ (.417)
Additional variables.	Female education, income inequality, percent urban, dummy for predominantly Muslim, ethnolinguistic fractionalization index, dummy for “tropical” country, access to safe water, dummy variables for region and a constant term.					
R-squared	.9469	.9465	.9512	.8834	.9608	.9430
Num. Obs.	98	98	73	73	75	75
Notes: White heteroskedasticity-corrected t-statistics are in parentheses. ~ Instruments are, neighbors’ public health spending, neighbors’ military spending, whether or not the country’s main export is oil, and years since 1776 that the country has been independent), and neighbor’s shares of spending on local health (column 4), and access to local health services (column 6). See Appendix A for full results.						

*Local outcomes.* A second empirical regularity that would be supportive of PHC is if the availability of primary level health facilities or community health workers had a demonstrable impact on local health status. However, the results on the effect of access to hospitals, doctors, and in particular here, public sector clinics, health centers, and rural health workers on health status is, at best, mixed.

A huge technical problem with empirical assessment of the impact of health facilities is that governments may have systematically placed health facilities. If the government places clinics where health status is worst, then a comparison of health status in localities with and

without clinics would *understate* the true impact of clinics. Conversely, if the government places clinics in villages where the population articulates the greatest demand, these may be where health would have been good in any case, and therefore comparisons of health status in localities with and without a facility would *overstate* the impact.

Some recent studies assess the effect of access to services on child or infant mortality using methods that take into account that the placement of facilities or services may vary systematically in response to local characteristics. Frankenberg (1993) controls for placement effects using a sample of pairs of randomly matched births from two different cohorts in a village in Indonesia and finds the presence of a maternity clinic or of a doctor reduces mortality, but also the presence of a health worker *increases* the probability of death (statistically significant only at the ten percent level). Pitt, Rosenzweig, and Gibbons (1993) address the placement effect using a panel of matched districts in Indonesia and find that the share of villages in a district with a health center increases mortality (statistically insignificant) while the share of villages with a family planning clinic reduces mortality (also statistically insignificant).

There are many econometric studies of the impact of facilities which do not control for selective placement.<sup>15</sup> Panis and Lillard (1994), after controlling for the potential endogeneity of facility *usage*, find that delivering a baby within an institution, the likelihood of which increases with facility availability, reduces the probability that a child would subsequently die

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<sup>15</sup> In her uncorrected estimates Frankenberg (1993) finds that more maternity clinics and health workers insignificantly reduce mortality while more doctors insignificantly increases mortality. In their uncorrected estimates, Pitt et al (1993) find that the presence of both health centers and family planning clinics raise mortality (insignificantly in the case of health centers).

in Malaysia but find, puzzlingly, that the use of prenatal care insignificantly increases the probability that the child will subsequently die. Benefo and Schultz (1994) find that households further from a clinic have higher child mortality in Cote d'Ivoire, but in Ghana proximity to clinics appears to increase mortality (statistically insignificant). Lavy, Strauss, Thomas, and de Vreyer (1996) find that the distance to health facilities significantly decreases mortality in rural Ghana (the presence of child services in that clinic is also significantly positively related to survival, however). In Malaysia, DaVanzo (1984) finds distance to medical care does not reduce infant mortality conditional on birth weight, but that birth weight is lower the greater the distance to care. Hossein (1989) finds that the presence of a dispensary and presence of a family planning clinic lowers mortality in Bangladesh. Rosenzweig and Schultz (1982) find that in rural Colombia, neither rural health posts, municipal level public and private clinics, dispensaries, or mobile care units are significantly related to child mortality. For urban areas they find that hospitals, clinics, and family planning clinics tend to reduce mortality, however this result is not consistent across all age groups. Rosenzweig and Wolpin (1982) use data from rural India to find that the fraction of villages in a district with a family planning clinic and the fraction with a dispensary, is associated with lower mortality, but that the fraction with an "other health facility (health centers, nursing homes, etc...)" is associated with higher mortality. Sastry (1995) finds that the number of general health facilities are insignificantly associated with higher mortality in Northeast Brazil and insignificantly with lower mortality in South/Southeast Brazil. Overall, the econometric evidence is mixed that there is a health effect of clinics at all, no less that it is large.

*Micro level: Project Evaluation.* There are a few evaluations of systematic experiments. Beginning in 1977 a very intensive program of provision of Maternal and Child Health and Family Planning (MCH-FP) services was introduced in a set of treatment villages in the Matlab region of Bangladesh (with a nearby set of villages served as a comparators). Mothers and children were visited every 15 days in the treatment area by a female worker with messages about family planning. Detailed vital records were kept in both areas. Although mortality among children fell (Muhuri and Preston, 1991), this has largely been attributed to measles immunization (Koenig, Faveau, and Wojtyniak, 1991, Menken and Phillips, 1990). An experimental design of the delivery of health care services for children which was intensively carried out in Narangwal, India, showed a six point drop in infant mortality over the three years of the project (from 96 per 1000) versus a one point increase in the control area (from 107 per 1000) with the difference being insignificantly different from zero (Taylor and Singh, ND, page IV.D.7).<sup>16</sup>

Taken together, these empirical results suggest that enhancing health outcomes is not simply a matter of providing additional funds, or increasing access to PHC-like services and facilities. This lack of demonstrated impact of PHC across a variety of countries and settings raises the importance of the framework discussed in Section 1, as the “chain” provides two likely explanations for why the impact on health status of public spending, even on PHC-like

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<sup>16</sup> The latter rate is, by the authors’ admission, a poorly measured one as it is based on a post-neonatal mortality rate increase in the three years of 49 percent. The authors explanation of this huge fluctuation is “due to incorrect age classification, [...] since in the control villages [...] vital statistics investigators who had no access to exact birth information and needed to rely on the age at death given by the mother of the family”.

interventions, might be low. First, the impact of provision will depend on the ability of the public sector to create *effective* services. Second, the impact of the provision of public services will depend on choices and the market for health, that is both on the private demand and how it may vary across disease conditions, and private supply and how it responds to public intervention.

### ***III) Public sector spending and the creation of effective health services***

One reason why PHC might have little impact on health status is not that *in principle* PHC is unimportant, but that *in practice* the efficacy of government actions has been low. Without personal experience it is difficult to appreciate how bad “low quality” public sector services can be. Traveler’s “tales” of public health clinics are legendary and we’ll give just three anecdotal examples. First, while one of the authors was visiting one low income country a prominent newspaper accused the Ministry of Health of misappropriating \$50 million of donor financing. The ministry the next day accused the newspaper of exaggeration and irresponsibility for failing to make it clear that this \$50 million was misappropriated over a period of *three* years, not in a single year as the newspaper reports implied. Second, a client survey of women who had a birth in the past 2 years at rural health centers in the Mutasa district of Tanzania revealed the most frequently cited disadvantages of giving birth in an institution were: *ridiculed by nurses* for not having baby clothes (22 percent), maternity fees (16 percent), nurses ordered mothers to wash linen used soon after delivery (16 percent), and

*nurses hit mothers during delivery!* (13 percent) (Mtemeli, 1994).<sup>17</sup> Third, in nearly every country one can find rural health clinics completely without drugs while the government (or donor) financed medicines are easily available on the black market. For example, over 70 percent of the government supply of drugs disappeared in Guinea in 1984 (Foster, 1990). Various studies in Cameroon, Uganda, and Tanzania estimated that about 30 percent of publicly supplied drugs were misappropriated, in one case as much as 30 to 40 percent of public supply was “withdrawn for private use” by staff (World Bank, 1994a).

### ***A) Evidence on quality***

There are a number of empirical studies of how quality of is linked to demand for public facilities (e.g. Akin, Guilkey, and Denton, 1995, Lavy and Germain, 1994, Lavy, et. al., 1996, Mwabu, Ainsworth, and Nyamete, 1993, Thomas, Lavy, and Strauss, 1996) and this literature is well reviewed in Alderman and Lavy (1996). Even though the measures of quality are not always satisfactory, the findings are that demand is responsive to quality. An example of the problematic nature of some of the measures is that the absence of various types of drugs is often used to indicate poor quality. Shortages, however, could be caused by high demand and hence it is hard to draw inferences about the causal relationship (a problem generally acknowledged by the authors). In addition, there may be important discrepancies between *de facto* and *de jure* measures of quality, a result highlighted by Thomas, Lavy, and

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<sup>17</sup> Interestingly, when nurses themselves were asked to give reasons why they thought mothers did not deliver in health institutions, the most frequently cited reasons were: distance/transport problems (20 percent), lack of clinic fees (14 percent), *harassment by nursing staff /fear of nurses* (11 percent).

Strauss (1996) who show the differential impact on health outcomes of the actual versus the official number of staff.

Both the ineffectiveness of low-level public sector health clinics and the element of individual choice are highlighted in the phenomenon of “bypassing.” People often do not go to the closest public facility but “bypass” it in favor of either more costly private facilities or higher level public facilities. There are few empirical studies of bypassing as this requires detailed information on both the health seeking behavior by individuals as well as information on all potential sources of supply. A recent study in Sri Lanka uses detailed surveys of health care supply and demand to document large amounts of bypassing (Sarasinghe and Akin, 1994). Table 2 shows that of all illness episodes only 29 percent are treated at the closest facility (which are predominantly Ayurvedic and “minor public western”), as 31 percent “self-treat” with no medical consultation and, of those that seek some treatment, 58 percent do not go to the nearest facility.<sup>18</sup> Of the non-Ayurvedic sources, the “minor public western” facilities, the type that PHC would promote, are bypassed the most. Most individuals who bypass either “minor” or “major” public facilities do so to visit a “private western” facility.

1		2		3	
Treatment chosen by ill		Percent of times each type of facility is bypassed		For each type of facility in column 2, the main type of facility that the bypassing individuals go to	
Self-care	31%				
Closest facility	29%				
Not closest facility	40%	Ayurvedic	40%	Private western	41%
		Minor public western	21%	Private western	50%
		Private western	10%	Major public western	58%
		Major public western	3%	Private western	68%
Source: Adapted from Sarasinghe and Akin, 1994					

<sup>18</sup> Ayurvedic are the local “traditional” sources of medical treatment.

The authors find the *public* facilities bypassed have fewer doctors, nurses, services, and levels of equipment. In contrast, the *private* western facilities that are bypassed are those with more doctors, nurses, services, and levels of service. While this might seem paradoxical, this is consistent with sophisticated health seeking behavior on the part of individuals. Since prices tend to be lower in the public facilities they will bypass sophisticated, but expensive, private for public if the condition is not serious or quality is not important. That is, they will bypass “expensive relative to the disease condition” private western facilities. However, for serious conditions or when quality of service is important, individuals will be willing to pay--both in terms of time and fees--for higher quality care.

Bypassing leads to low utilization of available public facilities. A recent survey of a rural area of Punjab province, Pakistan, found that although the physical infrastructure of rural PHC was in place

“[o]nly about 5 percent of the sick children were taken for treatment to primary health care facilities; half were taken to private dispensers, and another quarter to private MBBS doctors. Around 95 percent of deliveries took place at home.” (PIEDR, 1994, p.vi).

Roughly the same percentage of respondents sought treatment from a public rural health facility (5.2 percent) as a “quack” (4.9 percent) (PIEDR, 1994, p35). This was not because individuals were deterred from public facilities because of queues--on the contrary, the typical rural health center was seeing only about 30 patients a day, and the typical “basic health center” only 11 patients a day which was far below capacity as rural health centers had on average eight workers, and basic health units five. Two atypically busy rural health centers attracted and serviced an average of over 450 visits per day.

Low utilization is attested in a recent study of health center use in Indonesia. Even where public facilities were located in close proximity to large local populations annual caseloads were low (World Bank, 1994b). Based on detailed case studies the study identifies two principal reasons. First, many public facilities were lacking equipment, medicines, and appropriate health workers. Second, and more importantly, detailed assessments on the way resources were combined to produce health outcomes showed that poor functioning contributed to a large degree to the low public facility utilization. Respondents in one case-study felt that public facilities were of low quality while

“ [t]hey were confident that they could get considerate and unrushed care in a pleasant and informal setting in the private practice of doctors, bidans [midwives] and nurses” (World Bank, 1994b).

A recent study in El Salvador found remarkably similar results. Respondents consistently complained about the low quality of public health posts and units, especially relative to higher level services from health centers and hospitals. Typical answers were along the lines of:

Health posts operate only twice a week. Consultation is only until noon. The doctor is not always there. Sometimes only the nurse assistant is present. Waiting time is three hours on average. Only those who arrive by 8 get a consultation (World Bank, 1997).

In contrast to, for example, one typical respondent in El Pinar

“ [The health center at] La Palma is a little hospital with very good services. It is well equipped. The fee is only c/3 for consultation and sometimes medication” (World Bank, 1997)

The study in El Salvador assessed the impact of the very lowest level intervention, the health promoter who lives within the community and is supposed to be the first level of information and referral. The assessment found that focus group respondents had very little use for these

promoters, and regression analysis found that health promoters from the public sector had little or no effect on the probability of seeking medical treatment.

Even when the care provided in the public sector is of reasonable quality, it may be tremendously inefficient. An stark example of the kinds of inefficiency possible in the public sector is from an extremely detailed study of the *expenditures* versus the actual *costs* of production in a public hospital in the Dominican Republic measured through careful observations on time use (Lewis et al, 1996). The study showed that, although *spending* on personnel constituted 84 percent of total recurrent spending, actual staff costs were only 2.5 percent for treating emergency patients, 5.1 percent for inpatients, and 11.5 for outpatients (each expressed as a percentage of total costs).<sup>19</sup> Gross inefficiency was identified as the cause for this huge discrepancy. More importantly, the study concluded that the causes for these extraordinarily high costs lie within the functioning of the hospital. There was no accountability for physician or nurse performance, no rewards for extraordinary performance, no punishment for inadequate or nonexistent performance, salaries were low and undifferentiated, there was no management control over staff, and essentially no returns to effective management<sup>20</sup>.

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<sup>19</sup> A comparison of public and private hospitals in Argentina found that when accounting for all services the total was 2.4 services per professional per *day* in the public sector versus while in a private hospital doctors carried out 2.4 consultations per *hour*.

<sup>20</sup> There are nearly always serious problems with the private sector as well. But the underutilization, pure waste of materials, and ordinary inefficiency discussed above rarely make for a living wage for a professional, which creates a powerful incentive for efficiency.

***B) How is quality possible in the public sector?***

Even strong advocates of PHC would agree that there have been egregious failures of governments to provide high quality health services cost effectively. Conversely, even the most ardent critic of government acknowledges that there are examples of admirable and well functioning health facilities and agencies in the public sector. The difficult issue for health policy is whether failures are the result of ignorance and mistakes or whether failures are a systematic and expected result of incentives created by institutional and organizational arrangements. If one believes that existing public sector problems are easily remediable: through larger budgets, or earmarked inputs, or additional training, or “technical assistance” of various kinds, then the drawbacks of the quality of the *existing* public sector is no reason to back away from public provision as a strategy. On the other hand, if one believes the failures are endemic and intrinsic to the public sector one needs to reassess the strategy for the delivery mechanism of health services in its entirety.

*Pay, employment, and performance in the health sector.* There is no one right answer about public sector capability in the health sector. Some public sector agencies provide high quality, cost effective, health care. Other public sector agencies are capable of spending unlimited amounts of resources with no health gains. The tough policy questions are (1) are the conditions in place for effective public provision of particular health services? and if not then (2) is it possible to achieve those conditions within a reasonable time horizon? While some critics have perhaps been overly pessimistic about government capacity, supporters of publicly provided clinical services have paid far too little attention to the first question and been entirely too sanguine about the second.

The feasibility of incentivizing pay and employment in the public sector is not a new issue. It is generally recognized that the more essential and the less easily observable individual effort, the greater the importance of linking pay and performance (Milgrom and Roberts, 1992). Workers who are in situations where effort is easily observed and monitored are usually paid wages or salaries, while those working where output is observed but effort is not, like salesmen, are paid on the basis of outcomes. But in addition to the level of pay there is the question of continued employment. Where output is crucially linked to individual performance and there can be little tolerance for deviations from high quality, then continued employment is generally linked to performance. Observation of pay and employment across the public and private sector tends to reinforce this position. As illustration, Table 3 shows a matrix of jobs and how closely pay and employment tend to be related to performance.

		Degree to which pay is linked to performance		
		Low	Medium	High
Degree to which employment is linked to performance	Low	Traditional civil service arrangements (e.g. postal workers, administrators)	Stable large organizations	Piece Rate (harvesters, salesmen, contract workers)
	High	“Up or out” organizations (e.g. US military)	Most private sector organizations	Professionals (e.g. law firms, medical practices)

A glaring feature of this table is that *both* the pay and employment of private sector professionals (for example, lawyers, or doctors in medical practices) tend to be highly related to performance while in traditional public sector organizations *neither* are. While such an

observation is perhaps a commonplace, it has rarely been questioned that the provision of clinical services by health care professionals is amenable to public sector organization, even though quality is essentially unobservable to outsiders (both in terms of health efficacy and of client treatment).

One reason for this lack of inquiry is that sometimes the most obvious and seamlessly working features of a system are invisible and taken for granted when the system is functioning well. As a consequence, when one attempts to extrapolate from one set of social, legal, and political conditions to another very different set, the truly key features may be missed. For example, when asked why it is health workers will do the “right thing” even though there is no disciplining device of consumer choice, they are underpaid, there are no effective institutional controls, or no legal restraint like malpractice suits, the answer is often something like “they will behave because they are health *professionals*.” Indeed, with professionals from well functioning systems, this is most likely the right answer. Doctors and nurses do not perceive themselves as performing for the money or because of threats, but out of professional pride and affiliation. The underlying factors of compensation and punishment are invisible not because they are weak or absent, but precisely because they are so strong and effective that gross deviations from appropriate behavior are rare, and hence the need to invoke explicit punishment similarly rare. However, when the underlying control mechanisms are weak or non-existent, professionalism is not likely to be a powerful enough inducement.

Second, there are big advantages to having a mix of public and private with mobility between the two as a disciplining device on the behavior of individuals while in the public sector. Doctors working in a public sector hospital when there is a large and effective private

sector do not want to damage their reputation by performing noticeably worse than their colleagues. If there is no interchange either at the one extreme because the private sector is small, or at the other extreme the interchange is so large and fluid because health professionals work in both simultaneously and there is no standard for the public part of their practice, this regulating mechanism will cease to be effective.

*Lessons learned.* What are the lessons from the positive experiences where the public sector was effective at improving health outcomes? Close examination of campaigns where PHC-like programs have appeared to be successful have pointed to the importance of social, political, and institutional ability to motivate performance from health workers. Two examples are to the point.

First, Caldwell (1986) describes instances in Kerala, where community action held health workers accountable through strong-armed means:

“Doctors and others who provide village services (for instance, bus drivers plying regular routes) know stories of their fellows who were treated violently or hurt in protests about their having failed their duty” (p.199).<sup>21</sup>

The important role of social and political factors in generating the generally high performance of government services in Kerala is well described in Heller (1996).

The second example comes from an assessment of a major health campaign in the Ceara state of Northeastern Brazil which contributed to a 36 percent fall in infant mortality in only a few years (Tendler and Freedheim, 1994). Through a careful examination of the details

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<sup>21</sup>Caldwell (1986) also quotes from a colleague working in West Bengal where success was achieved “because [the state’s communist government] have used the party system to appoint cadres at every health center to report on doctors or nurses who do not put all their time and effort into their services or who discriminate between patients” (p.203).

of the implementation of the health program, Tandler and Freedheim identify three primary reasons behind this success. First, through a merit hiring system and a large advertising campaign “the state succeeded in creating an sense of ‘mission’ around the program and remarkable respect for its workers in the communities in which they served.” Second, flexibility in job descriptions allowed workers to take on tasks that although “sometimes viewed as distractions by experts [they] formed the basis for relations of trust between workers and citizens.” Third, job candidates, most of who were rejected, were educated about what to expect from workers, supervisors, and mayors, turning them into “informed public monitors of a new program in which the potential for abuse was high.”<sup>22</sup>

Motivating public (and private) sector workers to deliver high quality services is a long-standing issue (and not just in the health sector), especially in situations where monitoring of the key elements of performance is difficult or costly. As the examples above point out, such motivation seems to have been achieved through a variety of means: direct monitoring with the threat of job loss, community monitoring with various threats, and community oversight and participation with the threat of job (and prestige) loss. Although the declaration at Alma Ata stated that “community participation” was a key feature of the PHC strategy, it appears to be more the exception than the rule.

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<sup>22</sup> For example job applicants, and many eavesdroppers who listened in on the hiring process, were told “Those of you who are not selected must make sure that those who are chosen abide by the rules. [...] If these rules are breached we want to hear about it. [...] we are keeping all the applications, just in case any of those we hire do not perform well.” (Tandler and Freedheim, 1994, pp 1777-1778)

#### ***IV) How does public sector provision affect the use of services by individuals?***

A second possible reason large scale provision of some types of PHC services would have little or no impact on health status is if the extension of public supply merely “crowds out” the consumption of nearly equally effective services from private sources. Even if health services are delivered effectively by the government, the health impact of these services depends not on the total use of public services, but rather how public provision affects total use.

How big is the crowding out effect? A simple model of supply ( $S$ ) and demand ( $D$ ) will be useful to organize the evidence. The public sector is subscript “b,” “v” denotes the private sector, and  $P$  refers to the price.

$$S_b = D_b$$

$$S_v(P_v) = D_v(P_v, S_b)$$

*with total service use as*

$$D = D_b + D_v(P_v)$$

Alternatively, with a slight modification for the case when public and private services are essentially the same (perfect substitutes) in consumers’ eyes:

$$S_b + S_v(P_v) = D(P_v)$$

If the public sector expands service provision by a given amount,  $dS_b$ , (say in terms of capacity to see a certain number of patients per week), the total amount of added services used will be:

$$\frac{d D}{d S_b} = 1 + \frac{\epsilon_S \times \epsilon_{vb}}{\epsilon_S - \epsilon_D} \times \frac{D_v}{S_b}$$

where  $\epsilon_S$  refers to the elasticity of private services with respect to price,  $\epsilon_D$  refers to the elasticity of demand for private services with respect to price, and  $\epsilon_{vb}$  is the elasticity of demand for private services with respect to the availability of public services ( $\epsilon_S > 0$ ,  $\epsilon_D < 0$ ,  $\epsilon_{vb} < 0$ ). Alternatively, in the case of perfect substitution between public and private services:

$$\frac{d D}{d S_b} = \frac{\epsilon_D}{\epsilon_D - \theta \times \epsilon_S}$$

where

$$\theta = \frac{D_v}{S_b + D_v}$$

that is  $\theta$  is the share of the private sector in the total market.

While a naive approach might suggest that if the government increases its service capacity by  $dS_b$  then overall service use will increase by the same amount, the net effect of increasing public supply on total services is always less than one-for-one. The naive approach would be true only if there were no private sector or if there were no substitution between public and private services. Eye-balling the equation above, the increase in total available services resulting from an increase in *government* services will be *most limited*:

- the smaller the price elasticity of demand for services generally ( $\epsilon_D$ ),
- the larger the private sector ( $D_v/S_b$  in the first case,  $\theta$  in the second),

- the larger the cross price elasticity of demand for private and public services ( $\epsilon_{vb}$  in the first case with complete substitutability assumed in the second),
- the larger the elasticity of supply of private services ( $\epsilon_s$ )

We will review the evidence on each of these in turn.

*The smaller the overall elasticity of demand for services, the smaller the impact of public spending.* The elasticity of demand may well be the crux of the matter. Economists tend to shy away from discussions of “need” since this is not directly observable and is emotionally charged, but if an individual “needs” something, she or he is likely to buy it over a large range of circumstances. If income falls or prices rises, consumption of a “needed” good will be protected, and the adjustment will be greater with regard to other uses of money and time.

Since we assume that necessary health services (or at the very least those that alleviate unpleasant symptoms) are highly valued by individuals, one might assume that demand for them would be fairly insensitive to circumstances such as price or availability. Therefore, for those health services which are a matter of life or death, whose presence or absence would have the greatest impact on mortality statistics, one should expect low price elasticities of demand. To the extent that severe symptoms are associated with health problems for which the impact of clinical care will be greatest, these are the problems which are likely to be treated more or less successfully, regardless of the public presence.

Indeed, in China (Cretin, 1992, 1996), Indonesia (Gertler and Molyneaux, 1995) and in the United States (Manning, et al, 1987, Newhouse, 1995), studies confirm that the demand for treatment of serious conditions is less elastic than for less serious conditions. Market failures associated with treatment of serious problems are likely to manifest themselves in ways other than bad health. For example, people may be overcharged, service may be inconvenient

or assets may be liquidated at inopportune moments (to get ready cash) and all of these may be inefficient. But the impact on health will be small.

How well people can take care of their health problems can depend crucially on the relationship between the timing of symptoms and treatment. In emergency situations, to take an extreme case, the effectiveness of treatment is tightly time-bound and there is no chance for shopping around. Demand may be inelastic for treatment but other markets, such as emergency transportation or credit may not work well and public intervention may still be able to increase appropriate service use. This depends on whether pricing or other dimensions of access which government can influence act as a barrier to care.

A somewhat different dynamic provides another way in which governments may be able to increase access to socially optimal care. For health problems which can be treated if detected early, with symptoms which are relatively minor at early stages and, therefore, for which examinations may be highly elastic with respect to price or accessibility, government subsidies may well increase the appropriate use of services. Some types of cancer screening may fall into this category. Note that this line of reasoning relies on subtle interactions of the severity of symptoms, the effectiveness of treatment and, most importantly, the price (or location) responsiveness of demand for care. In general, however, one would expect more serious illnesses to be associated with more inelastic demand for public services and therefore, less potential influence of government policy on health status. Makinen and Raney (1994) summarize five studies of medical care demand and find that among the consistent results are

that “price influences choice among providers and does so more strongly than its influence on whether or not to use services at all”

*The larger the private sector, the smaller the impact of public spending.* Using a recent update of health expenditures data, Table 4 shows that in nearly all poor countries the largest part of health spending is made by private individuals. The share of health expenditures that is made by private individuals is 63 percent in the low-income country group, and reaches almost 75 percent in South Asia.

Table 4: Percent of total health expenditures that are private		
	Average	Number of countries
All countries	53.6	115
	Income groups	
Low income	63.1	32
Low-middle income	42.8	36
High-middle income	54.0	15
High income, non-OECD	62.0	10
High income, OECD	32.6	22
	Regions	
East Asia and Pacific	53.2	14
Latin America and Caribbean	58.1	32
Middle East and North Africa	47.4	11
South Asia	74.8	5
Sub-Saharan Africa	59.6	19
Rest of World	29.3	34

Notes: Average are population weighted means of countries from each region/group that have non-missing data.

Much of these private expenditures are likely made to private health care providers. Indirect evidence of this flows from the fact that public care is free, or close to free, for the user in many countries, especially the poorer ones. Direct evidence is more rare. A recent study of health care in five Indian states estimated the share of the private sector in health care provision and the results summarized in Table 5 show that: a large share (82 percent) of illness episodes result in a visit to a private provider, that expenditures for non-hospital

treatment are a large part of out-of-pocket expenditures (65 percent), and that private sector providers receive a large part of these non-hospital expenditures (56 percent).

	Guja- rat	Maha- rash- tra	Tamil Nadu	Uttar Pra- desh	West Bengal	Wgtd Avg.
<u>Rural areas</u>						
(1) Pct of treated illness episodes to <i>private</i> providers	69	78	71	91	83	82
(2) Pct of out-of-pocket exp. to non-hospital treatment	62	64	74	59	74	65
(3) Pct of out-of-pocket exp. to <i>private</i> non-hospital	48	55	68	51	65	56
(3) as a percentage of (2)	77	86	92	86	88	86
<u>Urban areas</u>						
(1) Pct of treated illness episodes to <i>private</i> providers	82	75	69	85	78	79
(2) Pct of out-of-pocket exp. to non-hospital treatment	61	60	69	57	63	61
(3) Pct of out-of-pocket exp. to <i>private</i> non-hospital	53	51	62	46	54	52
(3) as a percentage of (2)	87	85	90	81	86	85
Source: Adapted from World Bank (1995)						

*The more that people see the private sector as a substitute, the smaller the impact of public spending.* In addition to the size of the public sector, there is mounting evidence on the substitutability between the public and private health care providers in the demand for curative services. One source of evidence are estimates of the effect of increases in fees at public clinics on the probability that a sick individual will attend a public versus a private clinic. Table 6 summarizes the results of several studies which have estimated these cross-price effects. While results are not of the same size across all the countries, there is an effect of public prices on demand for care from the private providers. These are not negligible, especially if the effects are compared to the own-price effects. For example, in Nigeria 100 percent of those who are deterred by higher prices in the public sector seek care from the private sector, in Ghana 60 percent of those deterred go to private providers, while in El

Salvador the number is 50 percent. Clearly there is a high degree of substitutability between the two types of providers.

Table 6: Results from simulation studies on own- and cross-price effects on the probability of provider chosen: Percent deterred from public sector who go to private sector		
Sample	Price (or implicit price) changed	Percent
	<u>Increases in prices</u>	
Benin (rural)	Community Health Center (CHC) fees	61
Bolivia (urban)	Fees in Ministry of Public Health (MoPH) facilities, effect on adults 16 and over	33
Bolivia (urban)	Fees in Ministry of Public Health (MoPH) facilities, effect on children 15 and	0
Bolivia (urban)	Fees in Ministry of Public Health (MoPH) facilities, effect on children 4 and under	0
El Salvador (urban)	Fees in Ministry of Health (MoH) facilities, effect on males	56
El Salvador (urban)	Fees in Ministry of Health (MoH) facilities, effect on females	50
Ghana	Public fees	60
Kenya (rural)	Fees in gvt. facilities from 0 to 10 Ksh (US\$0.20), effect on adults 15 and over	37
Nigeria	Public prices, effect on adults 16 and over	100
Pakistan (urban)	Government clinic price, effect on children 5 and under	71
	<u>Increases in distance or time</u>	
Bolivia (urban)	Waiting time in Public Health (MoPH) facilities, effect on adults 16 and over	100
Bolivia (urban)	Travel time to Public Health (MoPH) facilities, effect on children 15 and under	20
Bolivia (urban)	Waiting time in Public Health (MoPH) facilities, effect on children 4 and under	20
Ghana	Distance to nearest public facility	50
Kenya (rural)	Distance to government facilities	44
Sources: Benin: Bolduc, Lacroix and Muller (1996); Bolivia: Ii (1996); El Salvador: Bitran and McInnes (1993); Ghana: Lavy and Germain (1994); Kenya: Mwabu, Ainsworth, and Nyamete (1993); Nigeria: Akin, Guilkey, and Denton (1995); Pakistan: Alderman and Gertler (1989);		
Note: See Appendix Tables B-1 and B-2 for further details on the results from these studies		

*The more the private sector expands with increased earning opportunities, the smaller the impact of public spending.* Government intervention may induce a private supply response which can mitigate any actual impact on health outcomes. For example, a case-control experiment in changing user fees in public facilities in Indonesia showed that, although there was an effect on the use of public facilities, there was a strong private sector supply response, and the effect on health outcomes was very small (Gertler and Molyneaux, 1995). After a liberalization of health care provision in Tanzania in 1991 the number of private sector providers skyrocketed, as non-profit units operated by “approved voluntary organizations” increased from 697 to 780 while the number of private for profit facilities increased from 41 to

1,340 (Munishi, 1997). The expansion is dominated numerically by lower level facilities like dispensaries (from 36 to 1313), but the number of private for profit hospitals also increased from 4 to 20, while the number of government hospitals remained constant at 77.

A review of public spending in the Philippines (World Bank, 1995) using panel data from 1983 to 1990 for 13 regions, found that public spending on health improved infant mortality in regions with lower incomes but had virtually no effect in richer regions. This is consistent with the private and public sectors being close substitutes in the higher income regions with a resulting highly-elastic private supply and small impact on outcomes, and a less-elastic supply response in poorer regions which results in a substantial impact of public spending (Hammer, 1997a).

While it might seem obvious that the private sector is an important part of the health sector that cannot be ignored in analysis of the potential impact of public sector interventions, it often has been ignored. A recent review of appraisals of World Bank projects, an institution with a large share of economists, found that out of 180 appraisal reports, *none*, that is, *not one*, referred to the implications for, and of, the private sector.

#### ***V) What, then, can be done?***

PHC programs have not had the impact some originally expected and the analysis and implementation of PHC gave insufficient attention to incentives in public sector employment and to market conditions. How can these concerns be more incorporated seriously when setting

priorities for public action?

***A) Maximizing the impact of public sector intervention***

The standard normative approach would be to determine those areas of expenditures yielding the greatest improvements in welfare per public dollar spent. Section IV told half the story: assess the welfare gain in services provided publicly net of private displacement effects. But how much is this extra amount worth? If markets were working the way they are idealized, the answer would be "not much" as the marginal value of the service would equal its marginal cost. It is only when markets are not working that the government can actually improve matters by intervening. The existence of such market failures induces a gap between the private value and the social value of services and it is the size of this gap which measures the value of any additional services induced by government policy.

There are a number of ways in which health care markets go wrong but these market failures are not all created equal, the difference between public and private values induced will vary substantially. At one extreme are pure public goods - those which cannot be provided by the private sector at all because they are non-excludable and non-rival. Most traditional public health interventions are in the nature of public goods, the best example being some forms of vector (pest) control. Another example would be the generation of knowledge if there is no way to restrict the use of information from research once created. The difference between social and private value for public goods is equal to the entire value of the services since they would not be provided at all without government intervention.

Another form of market failure is the presence of externalities, the effects on people other than the ones making the decision. The social value of these services exceeds the private value but the private value is not zero. Public involvement in the control of infectious diseases, vaccinations or educational campaigns address these problems. The net benefit from increased provision is only part of the total benefit, and this varies from nearly all of the benefit (public goods) to almost none (private goods).

In addition, several sorts of market failures in the health sectors are associated with imperfect information.<sup>23</sup> Potentially large failures associated with information occur when problems of asymmetric information are present. Two such areas are the delivery of medical services and in the general breakdown of insurance markets. Medical practitioners, acting as agents for the patients well-being and having influence over patients' decisions, have financial interests which do not coincide with those of their clients. "Supplier-induced-demand" is therefore always a potential problem in the medical marketplace.<sup>24</sup>

More pervasive is the limited scope, if not total absence, of insurance markets due primarily to the problems of adverse selection and moral hazard. Without insurance the observed demand for relatively expensive procedures may be much lower than socially optimal.<sup>25</sup> In the absence of insurance, the policy response may need to be the provision of hospitals.

Finally, the problem of the general lack of information may induce "inappropriate"

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<sup>23</sup>However, the argument that "imperfect information" is a cause of market failure must be treated with caution. Consumers are almost never completely knowledgeable of every potential relevant feature of a good in question. No market is perfect but the degree of imperfection and the welfare loss associated with it may be large or small.

<sup>24</sup> Whether this is an important problem empirically is subject to substantial debate as is the question of whether the effect on welfare is good or bad. Whatever the source of the problems though, there is reason for concern over the degree of competition in these markets. Unfortunately we know very little about the industrial organization of medical care in developing countries.

<sup>25</sup> Only expensive care is likely to be affected since the cost of the procedure must be large enough such that the insurance value exceeds the administrative costs of the insurance scheme.

demand. Too little for broccoli and immunizations, too much for tobacco and, perhaps, traditional healers. Again, the argument must be made with caution. It is strongest where there is no commercial (private) product associated with the action: washing hands less likely to be promoted than cold remedies. It is also most persuasive where there is little or no media access: illiterate societies with little radio or television penetration may not hear information which the media will spread.

Note that it is has been necessary to switch gears from "health status" to "welfare" in defining the value of services over their market-supplied levels. People value good health and to a large extent, higher welfare and better health will coincide. Sometimes, though, they will diverge. In some circumstances, health improvement might be possible but may come at too high a cost in terms of other things people value. For example, perfectly rational individuals, fully informed as to the impact of diet on health, might still choose to eat more meat than is consistent with optimal health. Desires for goods other than health status opens up the *possibility* of governments improving health with current resources but, in some circumstances, leaves doubt as to the *desirability* of doing so.

The reverse is possible as well: there can be justifiable health sector interventions which do not affect health status. The peace of mind brought by improving insurance against catastrophic financial loss may not translate into improved health status but may well be an important outcome of health policy. Similarly, improving proximity or amenities in health services to the extent that people desire and are willing to pay for them improves welfare but not necessarily health.

Some of the implications of the above arguments can be summarized by reference to the schematic in Table 7. The table classifies various health sector services by 1) the degree to which their markets are subject to serious failures yielding a large degree of distortion between public and private valuation and 2) the degree to which public intervention, provision of service or subsidies, can be expected to lead to increased use of services.<sup>26</sup>

Improvement in welfare is closely approximated by the product of the degree of distortion (the difference in social and equilibrium valuation of services) and the change in the use of the services induced by policy. The highest priority items from a welfare point of view are in the upper left box (I). The lower left hand box shows services in which there are large market failures but little responsiveness to public policy (II). The upper right box shows areas in which use of services may be greatly influenced by public action but which have little effect on welfare or health (III). As argued, demand for treatment of minor ailments is likely to be more highly elastic than for more serious illnesses. The lower right corner reflects curative care in clinics (IV). Not much is to be expected from public provision since people are likely to seek care anyway and the scope for market failure is limited as well.

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<sup>26</sup> The categories are for convenience only, both dimensions are continuous.

Table 7: Classification of various health interventions, by demand elasticity and degree of distortion.			
		Degree of distortion	
		High	Low
Elasticity of response	High	(I) vector control; vaccinations (?); hospital care when there is no insurance for catastrophic loss; research; information on treatment prices and options.	(III) Low value or ineffective public goods; routine clinical care (vague symptoms)
	Low	(II) emergency care; serious but affordable care; information from non-credible government.	(IV) routine curative care (clear symptoms)

It is important to note that the health implications of these interventions are not completely coincident with welfare effects. For example, the absence of an insurance market leads to the possibility of large gains in welfare from public provision of hospital services at subsidized rates. Whether this gain shows up in terms of improved health status or in terms of increased peace of mind depends on circumstances: if people tend to sell assets to get hospital care or to go into debt when serious illness strikes, there will be no health effect but a significant welfare impact. If the lack of insurance reduces access to life-saving care, the effect will show up in health status.

How does PHC fit into this picture? High subsidies for primary level curative care will tend to be covered by the low elasticity row of the table and right hand column of Table 7. For most serious but cheap curative care services, demand will be relatively inelastic and there is likely to be more substitution with the private sector (see section above). Clinical services for less serious ailments will tend to fall into the upper right hand box. The subsidization of

first contact clinical services without fees to screen for severity may be the most serious public policy issue raised by this box. Substantial resources may be used in administrative costs and provider's time in subsidizing relatively minor ailments. In Indonesia, it was found that many of the visits to district hospitals were for muscle aches and skin rashes (World Bank, 1994b). These tended also to be the ailments which fell most significantly when fees were raised. In the U.S., the most rapid increases in Medicare payments have been for home-care services which include housekeeping.

In sum, there is reason to doubt, on theoretical grounds, the likely impact on health of, at the very least, the curative care components of PHC strategies.

### ***B) Public intervention and poverty***

Public intervention in the health sector, particularly at the primary level, is often justified on the basis of its impact on poverty or on the distribution of resources, or access to resources, within a society. If the poor lack access to services which would allow them to escape poverty, the argument often goes, then governments are beholden to providing these services.

Table 8 shows a compilation of results on how the benefits of public spending on health are distributed across individuals in each per-capita income (or consumption) quintile. Public spending on health is somewhat, but not impressively, pro-poor, as in all but three of 11 cases the fourth quintile received larger per person benefits than the bottom quintile. Typically the

distribution of benefits is less equal than would be a uniform transfer, but more equal than the distribution of income (so that public spending on health financed by a proportional tax would be progressive). Moreover, from the analysis above it should be obvious that even if the distribution of the of public spending on health is uniform across income groups the impact on health status of public spending will be larger for the poorest, as the *net* impact on consumption of health services of a given amount of public benefits is likely to be larger for the poorest as the displacement effects are smaller. This is consistent with the findings of Bidani and Ravallion, 1997 cited above, that public spending had no demonstrable impact on the non-poor but was important for the poor.

Table 8: Distributional incidence of public spending on health of each income quintile relative to the poorest.						
Country:	Year	Poorest	2nd	3rd	4th	Richest
Argentina	1991	1	0.62 <sup>1</sup>	0.62 <sup>1</sup>	0.62 <sup>1</sup>	0.18
Brazil	1990	1	2.25	3.75	3.13	2.50
Bulgaria	1995	1	1.23	1.62	2.00	1.92
Chile	1982	1	1.02 <sup>1</sup>	1.02 <sup>1</sup>	1.02 <sup>1</sup>	0.50
Ghana	1994	1	1.25	1.58	1.75	2.75
Indonesia	1987	1	1.17	1.58	2.25	2.42
Kenya	1992	1	1.21	1.57	1.57	1.71
Malaysia	1989	1	0.69 <sup>1</sup>	0.69 <sup>1</sup>	0.69 <sup>1</sup>	0.38
Mongolia	1995	1	1.11	1.06	1.09	1.34
South Africa	1993	1	1.40 <sup>1</sup>	1.40 <sup>1</sup>	1.40 <sup>1</sup>	1.06
Uruguay <sup>2</sup>	1989	1	0.57	0.46	0.38	0.30
Vietnam	1993	1	1.33	1.75	1.83	2.42

Notes: 1) Distribution across these quintiles not distinguished in original source. 2) Quintiles defined on household, not per capita basis.  
Sources: See references in Appendix C.

Evaluating the distributional impact of public spending on health is even more difficult than calculating the incidence of expenditures, as the distributional impact of raising revenue

needs to be evaluated as well. The net welfare effect of using a regressive tax to fund a progressive program is very hard to evaluate. Combining the incidence of raising and of spending revenue is rarely done, mainly because of the lack of data. Table 9 summarizes the findings of two recent studies have attempted to combine what data there was to evaluate the combined incidence. Both studies found that the incidence of taxes was roughly proportional but public expenditures were progressive leaving the overall incidence to be progressive. That is, as a share of household income (or expenditures) the poor benefit more from the combined effect of taxes and public expenditures.

Table 9: Evaluating the net effect of taxes and spending							
Mongolia				Philippines			
Quintile	Taxes	Expenditures*	Combined incidence	Decile	Taxes	Expenditures*	Combined incidence
as a share of per-capita household expenditure							
Poorest	.080	.238	-.160	Poorest	.208	.469	-.261
				2nd	.205	.222	-.017
2nd	.090	.168	-.080	3rd	.201	.175	.026
				4th	.200	.144	.056
3rd	.070	.100	-.030	5th	.198	.122	.076
				6th	.199	.102	.097
4th	.100	.092	.008	7th	.201	.087	.114
				8th	.197	.069	.128
Richest	.100	.064	.036	9th	.197	.051	.146
				Richest	.196	.001	.195

Notes: \*Expenditures include Health and Education in Mongolia, Health, Education, and Infrastructure in the Philippines.  
Sources: Mongolia from World Bank (1996), Philippines from Devarajan and Hossein (1995)

Part of the case frequently made is that expenditures on PHC are more pro-poor than are aggregate health expenditures, which include hospitals and the like, and table 10 presents some recent evidence on this. The table shows the ratio of the share of benefits received by each quintile from two different types of spending. For instance, in Indonesia 18 percent of

the benefits from public health center spending accrue to the poorest quintile while only 8 percent of the spending on hospitals does (see Appendix Table C-2), so even though PHC is (slightly) less progressive than a uniform transfer, the ratio of benefits of the two types of spending is 2.25. In seven of ten cases the poorest quintile benefits proportionately more from the lower level facilities than from hospitals, while the richest quintile benefits proportionately more from hospital spending. However, the number of cases where the poorest quintile receive more than their population share is equal to that where they do not (see Appendix Table C-2). For instance, in Bulgaria the poorest quintile receive only 16 percent of the benefits of public spending on primary facilities, whereas in Guyana they receive 28 percent of the benefits of public spending on public health centers. In both cases, however, the ratio of this share to the share received from spending on hospitals is about the same (1.45 and 1.47 respectively). Thus, recent studies do tend to confirm previous findings about the favorable distributional impact of lower level spending versus hospital care, but not because PHC is always strongly pro-poor, but because hospital spending is nearly always strongly pro-rich.

Table 10: Ratio of each quintile's share of the benefits from different types of public spending on health.							
Country	Year	Types of Public Spending Compared:	Poorest	2nd	3rd	4th	Richest
Bulgaria	1995	Primary/Hospital	1.45	1.06	1.05	1.56	0.78
Ghana	1994	Primary/Hospital Outpatient	0.77	1.13	1.12	1.21	0.89
Guyana	1994	Health Center/Hospital	1.47	0.70	1.17	0.79	1.17
Indonesia	1987	Health Center/Hospital	2.25	1.73	1.24	0.86	0.49
Jamaica	1989/92	Health Center/Hospital	1.32	1.67	0.70	0.78	0.61
Kenya	1992	Health Center/Hospital	1.85	1.44	1.05	0.77	0.50
Tanzania	1993/94	Health Center/Hospital	1.64	1.50	1.27	0.91	0.57
TTO	1992	Health Center/Hospital	0.47	1.52	0.56	0.44	1.90
St. Lucia	1995	Health Center/Hospital	0.96	0.93	1.07	0.73	1.41
Vietnam	1993	Commune Health Center/Hospital Outpatient	2.11	2.07	1.60	0.83	0.26

Source: See Appendix C.

The same pattern probably extends to the comparison between the clinical components of PHC and traditional public health interventions aimed primarily at infectious disease (vector control, immunization, sanitation). We must say “probably” because almost by definition it is difficult to assess distributional consequences of spending on true public goods (Cornes, 1995). However, existing evidence indicates that the poor suffer disproportionately from infectious disease and would benefit most from their control (Hammer, 1997). If we are contemplating a reallocation of health resources from public hospital services to PHC, there will likely be an improvement in the distribution of benefits but at the expense of corrections to the insurance problem that public hospitals might solve. If we are contemplating a reallocation from the population based services to PHC-type clinical services, however, there will be losses in terms of both equity and efficiency.

Whether PHC is a good means of redistribution needs to be evaluated country by country and evaluated against other such programs. As shown above the success of targeting,

even for primary or “primary-like” services, varies widely across countries. Any particular country arguing for PHC as a redistributive mechanism must be careful that it is indeed achieving that aim. Moreover, there are other means, outside of the health sector, for redistribution within a country. If the argument for PHC is based on its redistributive properties, it needs to be compared to other anti-poverty schemes, some of which may be more (or less) successful at targeting, some of which may be more (or less) feasible.<sup>27</sup>

### **Conclusions.**

If the answer to the question “what should be done?” is not “it depends” either the question was trivial or the answer was wrong. By the same token to answer “it depends” without saying on what it depends and in what measure is equally uninteresting. The obvious policy of reallocating resources from “ineffective” tertiary to “effective” primary is not supported either theoretically or empirically by actual outcomes. There are three “depends” that must factor into public policy.

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<sup>27</sup> Moreover, effectively targeted programs may be appealing as they appear to maximize the poverty impact of a fixed budget, however they may be politically unsustainable. If a large part of the motivation behind public spending on health is because of redistribution then one might ask why the current incidence is not better targeted towards the poor. The answer may lie in the fact that when the number of recipients of a publicly provided benefit falls, political support for the program may disappear. Gelbach and Pritchett (1997) construct a simple economic model of transfers with voting and show how, under reasonable assumptions, the welfare maximizing outcome for the poor is a universal transfer because when benefits are targeted to the poor, the non-poor will vote to reduce the overall budget devoted to transfers.

First, health policy depends on the anticipated efficacy of the public sector under existing institutional arrangements. If this is low, and it has been extremely low in many developing (and more than a few developed) country settings, then adopting strategies that are intensive in public sector capacity are of dubious validity. That is, providing a centrally controlled nation-wide network of primary level facilities that provide clinical care and integrate into a comprehensive chain of referral is an extraordinarily capacity intensive task. Kerala might be able to do it, Bihar certainly cannot. It may well be that every country really capable of implementing a successful PHC strategy is already implementing PHC.

Second, health policy depends on the underlying justification for public intervention. If it is because government is providing a pure public good and individual cost recovery is impossible then there is no alternative to the public sector (e.g. vector control, disease surveillance). If, on the other hand, a supply of services would be forthcoming if there were effective demand (e.g. clinical services) then even in the presence of externalities (e.g. immunizations) public provision may not be the best way to raise consumption. Alternatives that leave power and choices in the hands of consumers might be preferred.

In low income countries with low capacity in the public sector (and in spite of their self-assessment, this is most low-income countries) the focus should be on basic public health, disease eradication, and those programs that can be administered effectively (perhaps vaccination campaigns). Inexpensive curative services should be left to the market, or at the very least charged for. In countries with slightly higher capacity the focus should be to

regulate the market and perhaps to provide demand based instruments.

Third, the impact of health policy depends on how responsive individuals' decisions are to public actions. Health care services that are cheap and critical are extremely unlikely to be sensitive to price, except for the very poorest in the poorest countries. In higher income countries that are further along in the epidemiological transition the development of mechanisms to pool risk is the key element and expansion of primary curative services is unlikely to be important.

In sum, we are emphatically not defending the common developing country *status quo* in which the public spends large amounts on ineffective secondary and tertiary facilities servicing primarily a richer urban clientele. That said, there are few instances in which the traditional approach to PHC, with government supplied community health workers and government run primary facilities providing a mix of preventive and simple curative services is going to be right either.

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## Appendix A: Cross national data and results

This appendix provides details on four aspects of the cross national regressions: data on health status, data on independent variables, data on health sector strategy.

### a) Data on health status

The data used here are as reported by UNICEF (1992) except for the mortality rates for Zaire which are unbelievable: under-5 mortality rate for 1990 is reported as 130 and infant mortality rate as 79. These are replaced with the, more reliable, estimates reported in United Nations (1992) for 1984. These are 200 for under-5 mortality and 126 for infant mortality.

### b) Data on non-health sector variables

<i>Income</i>	Real GDP per capita in 1995 international dollars (i.e. adjusted for Purchasing Power Parity) are from the Penn World Tables 5.6.
<i>Education</i>	Average education levels for men and women over 15 are from Barro and Lee (1996).
<i>Income inequality</i>	Gini coefficient as calculated by Deininger and Squire (1996) multiplied by 100.
<i>Percent urban</i>	Percent of the country's population that lives in urban areas. From the World Bank's Social Indicators of Development database (World Bank, 1997).
<i>Predominantly Muslim</i>	Dummy equal to one if over 90 percent of the country's population is Muslim.
<i>Ethnolinguistic fractionalization</i>	Index of ethnolinguistic fractionalization for 1960. Measures the probability that two randomly selected people from a given country will not belong to the same ethnolinguistic group as reported in Easterly and Levine (1996).
<i>Tropical country</i>	Dummy equal to one if part of the country's territory lies within 20 degrees of the equator.
<i>Access to safe water</i>	Percent of population with access to safe water. From the World Bank's Social Indicators of Development database (World Bank, 1997).
<i>Oil exporter</i>	Dummy equal to one if the country primary export is fuels (mainly oil) as classified by the World Bank's World Development Indicators (1996) plus Kuwait.
<i>Years independent</i>	The percentage of years since 1776 that a country has been independent, as reported in Easterly and Levine (1996).
<i>Defense spending</i>	Defense spending as a share of GDP, as reported in CIA (1994)

### c) Data on health sector variables

<i>Health Expenditures</i>	Updates of health expenditures from Murray, Govindaraj, and Musgrove (1995) which appear in World Bank (1993)
<i>Percentage of national health expenditures devoted to local health services</i>	As reported in the WHO's Health for All Database. The observation closest to 1990 in the 1986-1993 period is used.
<i>Percentage of the population with local health services, including availability of essential drugs, within one hour's walk or travel</i>	As reported in the WHO's Health for All Database. The observation closest to 1990 in the 1986-1993 period is used.

Table A1-1: Dependent variable: Under-5 mortality rate (ln)							
Column:	1	2	3	4	5	6	7
Method	Mean (SD)	OLS	2SLS	OLS	2SLS	OLS	2SLS
GDP per capita (ln)	5,004* (5,300)	-.611 (9.71)	-.596~ (3.67)	-.624 (8.16)	-.921~ (1.84)	-.616 (9.08)	-.829~ (2.47)
Public health exp. (ln share of GDP)	.02967* (.01998)	-.135 (1.78)	-.192~ (.742)	-.165 (1.73)	-.139~ (.359)	-.085 (.931)	.146~ (.374)
Local health svcs (ln share of health expend)	0.328* (0.198)			.076 (1.78)	-.359~ (.754)		
Access to local health svcs (ln share of pop)	0.781* (0.248)					-.024~ (.227)	.336~ (.417)
Female education	4.971 (2.753)	-.093 (3.54)	-.091 (2.90)	-.095 (3.04)	-.062 (.871)	-.085 (2.82)	-.111 (2.67)
Income inequality	40.93 (8.706)	.008 (1.28)	.008 (1.17)	.004 (.569)	.023 (.954)	.007 (1.17)	.013 (1.45)
Percent urban	49.96 (25.01)	.001 (.459)	.001 (.219)	-.0001 (.030)	.001 (.107)	-.00004 (.016)	.006 (.732)
Predominantly Muslim	0.120 (0.327)	.450 (3.18)	.446 (2.91)	.413 (2.83)	.305 (1.56)	.503 (3.49)	.388 (1.26)
Ethnolinguistic fractionalization	.4219 (.2871)	.549 (3.43)	.534 (2.90)	.487 (2.52)	.172 (.413)	.478 (3.02)	.642 (2.63)
Tropical country	0.620 (0.488)	-.051 (.549)	-.059 (.619)	-.184 (1.49)	-.035 (.136)	-.111 (.849)	-.124 (.941)
Access to safe water	67.13 (25.73)	-.001 (.606)	-.001 (.390)	-.001 (.375)	-.001 (.172)	-.0004 (.156)	-.003 (.438)
Additional vars.		Dummy variables for area and a constant term. Dummy variables for when female education, income inequality, ethnolinguistic fractionalization, or access to safe water are missing.					
R-squared		.9469	.9465	.9512	.8834	.9608	.9430
Num. Obs.	100	98	98	73	73	75	75
Notes: White heteroskedasticity-corrected t-statistics are in parentheses. * Mean and SD of non-logged values. ~ Instruments are, neighbors' public health spending, neighbors' military spending, whether or not the country's main export is oil, and years since 1776 that the country has been independent), and neighbor's shares of spending on local health (column 4), and access to local health services (column 6).							

## Appendix B: Own- and cross-price effects

Appendix Table B-1: Own- and cross-price effects on the probability of provider chosen: Results from simulation studies Percentage point change in probability of selecting a provider [percent change in probability of selecting a provider] (predicted probability at means or sample percentage selecting a provider)						Percent deterred who go to private
Nigeria 100% increase in public prices Adults 16 and over	Public -1.0 [-2.9] (35)		Private 1.0 [1.9] (13)		Self-care 0.0 [0.0] (52)	100
Ghana 100% increase in public fees	Public -0.5 [11.3] (4)		Private 0.3 [1.9] (14)		Self-care 0.2 [0.3] (82)	60
Kenya (rural) increase fees in government facilities from 0 to 10 Ksh (US\$0.20 at 1980 exchange rate) Adults 15 and over	Government -9.7 [-18.2] (54)		Mission 0.8 [20.9] (4)	Private 2.8 [20.9] (14)	Self-care 6.1 [20.9] (29)	37
Benin (rural) 10% increase in Community Health Center (CHC) fees	Pub. Hosp. -0.1 [-1.5] (7)	CHC -8.3 [-26.1] (32)	Private clinic 5.1 [29.1] (18)		Self-care 3.3 [7.5] (44)	61
Pakistan (urban) 100% increase in government clinic price Children 5 and under (derived from reported arc elasticity)	Government Clinic -4.4 [-47.0] (9)		Priv chemist 0.72 [4.5] (16)	Priv. doctor 2.39 [4.2] (57)	Self-care 0.39 [2.2] (18)	71
El Salvador (urban) 100% increase in fees in Ministry of Health (MoH) facilities - Males (scaled from a reported 150% change)	MoH fac. -0.9 [-14.3] (7)	Social sec. 0.0 [2.2] (1)	Private 0.5 [3.4] (14)		Self-care 0.5 [0.6] (79)	56
El Salvador (urban) 100% increase in fees in Ministry of Health (MoH) facilities - Females (scaled from a reported 150% change)	MoH fac. -1.0 [-13.0] (8)	Social sec. 0.0 [3.2] (1)	Private 0.5 [3.9] (14)		Self-care 0.5 [0.5] (78)	50
Bolivia (urban) 100% increase in fees in Ministry of Public Health (MoPH) facilities Adults 16 and over	MoPH fac. -0.9 [-5.8] (15)	Social sec. 0.1 [1.3] (8)	NGO 0.1 [1.0] (10)	Private 0.2 [1.1] (19)	Self-care 0.6 [1.2] (48)	33
Bolivia (urban) 100% increase in fees in Ministry of Public Health (MoPH) facilities Children 15 and under	MoPH fac. 0.1 [1.3] (8)	Social sec. 0.0 [0.0] (2)	NGO 0.0 [0.0] (8)	Private 0.0 [0.0] (8)	Self-care -0.1 [-0.1] (74)	0
Bolivia (urban) 100% increase in fees in Ministry of Public Health (MoPH) facilities Children 4 and under	MoPH fac. 0.4 [4.8] (8)	Social sec. -0.1 [5.0] (2)	NGO 0.0 [0.0] (7)	Private 0.0 [0.0] (6)	Self-care -0.4 [0.5] (77)	0
Sources: Nigeria: Akin, Guilkey, and Denton (1995); Ghana: Lavy and Germain (1994); Kenya: Mwabu, Ainsworth, and Nyamete (1993); Benin: Bolduc, Lacroix and Muller (1996); Pakistan: Alderman and Gertler (1989); El Salvador: Bitran and McInnes (1993); Bolivia: Ii (1996).						

Appendix Table B-2: Own- and cross-price effects on the probability of provider chosen: Results from simulation studies Percentage point change in probability of selecting a provider [percent change in probability of selecting a provider] (predicted probability at means or sample percentage selecting a provider)						Percent deterred who go to private
Ghana 100% increase in distance to nearest public facility	Public -9.8 [-244.9] (4)		Private 4.9 [34.8] (14)		Self-care 5.9 [7.2] (82)	50
Kenya (rural) 20% increase in distance to government facilities	Government -0.9 [-1.6] (54)		Mission 0.1 [1.8] (4)	Private 0.3 [1.8] (14)	Self-care 0.5 [1.8] (29)	44
Bolivia (urban) 100% increase in waiting time in Ministry of Public Health (MoPH) facilities Adults 16 and over	MoPH facility -0.2 [-1.4] 15	Social security 0.0 [0.0] (8)	NGO 0.1 [1.0] (10)	Private 0.1 [0.5] (19)	Self-care 0.1 [0.2] (48)	100
Bolivia (urban) 100% increase in travel time to Ministry of Public Health (MoPH) facilities Children 15 and under	MoPH facility -1.5 [-19.5] (8)	Social security 0.0 [0.0] (2)	NGO 0.1 [1.2] (8)	Private 0.2 [2.4] (8)	Self-care 1.1 [1.5] (74)	20
Bolivia (urban) 100% increase in waiting time in Ministry of Public Health (MoPH) facilities Children 4 and under	MoPH facility -1.0 [-11.5] (8)	Social security 0.1 [5.3] (2)	NGO 0.1 [1.5] (7)	Private 0.1 [1.7] (6)	Self-care 0.9 [1.2] (77)	20
Sources: Ghana: Lavy and Germain (1994); Kenya: Mwabu, Ainsworth, and Nyamete (1993); Benin: Bolduc, Lacroix and Muller (1996); Bolivia: Ii (1996).						

## Appendix C: Sources for health spending benefit incidence analyses

Appendix Table C-1: Relative value of the benefits (subsidies) of public spending on health by household income or consumption per capita quintile.							
Relative value of benefits (q1 normalized to 1)							
Country	Year		Poorest	q2	q3	q4	Richest
Brazil	1990	Public spending on health	1	2.25	3.75	3.13	2.50
Bulgaria	1995	All health	1	1.30	1.64	2.04	1.99
		Primary facilities	1	1.09	1.33	1.54	1.32
		Hospitals	1	1.45	1.86	2.40	2.48
Colombia*	1992	Public health system	1	1.03	0.78	0.77	0.68
		ISS (Institute Soc. Sec)	1	2.59	2.24	1.55	1.24
Ghana	1992	All health	1	1.33	1.61	1.84	2.84
		Primary facilities	1	1.64	1.82	2.21	2.97
		Hospital outpatients	1	1.15	1.33	1.45	2.67
		Hospital inpatients	1	1.34	1.91	2.17	3.00
Honduras*	1992	FHIS (Soc. Inv. Fund)	1	0.71			.357
		Hospitals	1	0.47			2.84
		Primary health	1	0.89			.778
Indonesia	1987	Total	1	1.22	1.56	2.25	2.42
		Hospital	1	1.40	2.10	3.14	4.27
		Public health center	1	1.07	1.14	1.32	.949
Kenya (rural)	1992	Total	1	1.20	1.57	1.51	1.70
		Hospitals	1	1.26	1.72	1.71	1.99
		Health centers	1	.950	.967	.692	.550
		Dispensaries	1	1.67	1.33	1.11	1.11
Madagascar	1993/94	Public health care	1	1.53	1.12	2.05	2.44
Mongolia	1995	Health subsidy	1	1.11	1.06	1.09	1.34
Vietnam	1993	All	1	1.34	1.78	1.87	2.46
		Commune health centers	1	1.50	1.30	1.00	.500
		Hospital outpatients	1	1.48	1.67	2.42	4.18
		Hospital inpatients	1	1.28	1.89	1.69	1.84

Notes: \* Persons are assigned to quintile on the basis of the ranking of households (i.e. the number of individuals in each quintile is non-constant). Brazil: groups defined relative to the minimum wage; the groupings are <1/4, 1/4-1/2, 1/2-1, 1-2,>2 times the minimum wage. The population distribution across these groups (in percent) is 11,17,23,22,27.  
Honduras: categories are poorest, intermediate, least poor whose distribution is 31,19,50 percent of households  
Nicaragua: categories are extreme poor, poor, non-poor, whose population distribution is 19.4, 30.9, 49.7 percent. See Appendix 3 for sources.

Appendix Table C-2: Distribution of the benefits of public spending (subsidies) on health by household income or consumption per capita quintile.

Percent of benefits							
Country	Year	Type	Poorest	q2	q3	q4	Richest
Argentina	1991	PHS+	33	61			6
Brazil	1985	PHS+	17	41			42
Bulgaria	1995	All health	13	16	21	26	25
		Primary facilities	16	17	21	25	21
		Hospitals	11	16	20	16	27
Chile	1982	PHS+	22	67			11
Colombia*	1992	Public health system	27	26	19	16	13
		ISS (Inst. Soc. Sec.)	18	42	35	21	15
Ghana	1994	All health	12	15	19	21	33
		Primary facilities	10	17	19	23	31
		Hospital outpatient	13	15	17	19	35
		Hospital inpatient	11	14	20	23	32
Guyana	1994	Public hospital	19	23	18	28	12
		Public health center	28	16	21	22	14
		Public health post	67	3	7	16	7
		Public medicines	18	7	11	31	32
Indonesia	1987	Total	12	14	19	27	29
		Hospital	8	11	17	28	35
		Public health center	18	19	21	24	17
Jamaica	1989/92	Hospital	19	18	23	23	18
		Health center	25	30	16	18	11
Kenya	1992	Total	14	17	22	22	24
		Hospitals	13	16	22	22	26
		Public health center	24	23	23	17	13
		Dispensaries	17	20	23	19	19
Madagascar	1993/94	Public health center	12	19	14	25	30
Malaysia	1989	PHS+	29	60			11
Nicaragua	1995	Pre-natal and births	12	31		57	
		Curative care	10	28		63	
Tanzania*	1993/94	Hospital outpatient: curative	11	14	15	23	37
		Hospital outpatient: prenatal	18	22	15	25	21
		Hlth cntr outpatient: curative	18	21	19	21	21
		Hlth cntr outpatient: prenatal	25	15	21	18	21
Trinidad and Tobago	1992	Hospital	17	23	25	16	19
		Health center	8	35	14	7	36
South Africa	1993	PHS+	16	67			17
St Lucia	1995	Public hospitals	26	28	14	15	17
		Public health centers	25	26	15	11	24
Uruguay*	1989	Total	37	21	17	14	11
		Ministry of Public Health	57	25	12	5	1
		Public hospital	44	22	15	12	7
Vietnam	1993	All	12	16	21	22	29
		Commune health centers	19	29	24	19	10
		Hospital outpatients	9	14	15	23	39
		Hospital inpatients	13	17	25	22	24

Notes:\* Persons are assigned to quintile on the basis of the ranking of households (i.e. the number of individuals in each quintile is non-constant). Nicaragua: categories are extreme poor, poor, non-poor, whose population distribution is 19.4, 30.9, 49.7 percent. + Source listed spending only as "Public health spending". See Appendix 3 for sources.

Sources for benefit incidence numbers:

World Bank Poverty Assessments and country studies:

Brazil, 1995; Colombia, 1994; Honduras, 1994; Kenya, 1995; Madagascar, 1996; Mongolia, 1996; Nicaragua, 1995; Tanzania, 1995; Uruguay, 1993; Vietnam, 1996

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Baker, Judy, 1997. Poverty Reduction and Human Capital Development in the Caribbean: A Cross-Country Study, The World Bank:

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Van de Walle, Dominique, "The Distribution of Subsidies through Public Health Services in Indonesia, 1978-87," The World Bank Economic Review, 8(2):279-309:  
Indonesia.