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H N P D I S C U S S I O N P A P E R

# Research on Equity, Poverty and Health Outcomes

## Lessons for the Developing World

Adam Wagstaff

October 2000





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## Health, Nutrition and Population (HNP) Discussion Paper

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ISBN 1-932126-26-0

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# Contents

SUMMARY.....	1
ACKNOWLEDGEMENTS .....	1
<b>1. INTRODUCTION.....</b>	<b>2</b>
<b>2. MEASURING AND TESTING FOR INEQUALITIES IN HEALTH .....</b>	<b>4</b>
2.1. THE CONCENTRATION CURVE AND CONCENTRATION INDEX.....	4
2.2. DEMOGRAPHIC FACTORS AND UNAVOIDABLE INEQUALITIES.....	6
<b>3. HEALTH INEQUALITIES IN LMICS .....</b>	<b>10</b>
3.1. HEALTH INEQUALITIES IN LMICS AMONGST CHILDREN.....	11
3.2. HEALTH INEQUALITIES AMONGST ADULTS.....	14
<b>4. UNDERSTANDING HEALTH INEQUALITIES: A FRAMEWORK.....</b>	<b>17</b>
<b>5. THE PROXIMATE DETERMINANTS OF HEALTH INEQUALITIES .....</b>	<b>21</b>
5.1. WHAT ARE THE PROXIMATE DETERMINANTS OF HEALTH?.....	21
5.2. THE DISTRIBUTION OF HEALTH SERVICE UTILIZATION.....	21
5.3. THE DISTRIBUTION OF THE OTHER PROXIMATE DETERMINANTS OF HEALTH.....	27
5.4. EXPLAINING INEQUALITIES IN HEALTH THROUGH INEQUALITIES IN PROXIMATE DETERMINANTS.....	28
<b>6. THE UNDERLYING DETERMINANTS OF HEALTH INEQUALITIES .....</b>	<b>29</b>
6.1. WHAT ARE THE UNDERLYING DETERMINANTS OF HEALTH? .....	29
6.2. THE DISTRIBUTION OF THE UNDERLYING DETERMINANTS OF HEALTH.....	32
6.3. EXPLAINING INEQUALITIES IN HEALTH THROUGH INEQUALITIES IN UNDERLYING DETERMINANTS.....	35
<b>7. PUBLIC POLICY AND HEALTH INEQUALITIES .....</b>	<b>36</b>
7.1. WHAT PUBLIC POLICIES IMPACT ON HEALTH INEQUALITIES?.....	36
7.2. RESEARCH ON THE IMPACT OF POLICIES ON HEALTH INEQUALITIES .....	38
7.3. RESEARCH ON THE IMPACTS OF SPECIFIC PROGRAMS ON HEALTH INEQUALITIES.....	40
<b>8. CONCLUSIONS .....</b>	<b>42</b>
<b>REFERENCES .....</b>	<b>45</b>



## Summary

This paper provides a selective survey of the literature to date on poverty, equity and health outcomes. It begins with an overview of the methods that can be used to measure poor-nonpoor inequalities in health outcomes, and then reviews the evidence on the extent of these inequalities in low and middle-income countries (LMICs). The data presented relate mostly to children, but some results are also presented on adults. The paper then presents a conceptual framework for understanding the causes of poor-nonpoor inequalities in health outcomes, distinguishing between the effects of inequalities in the *proximate* determinants of health, and inequalities in the socioeconomic or *underlying* determinants. The paper goes on to review the evidence on what these determinants are, and how far inequalities in them appear to explain inequalities in health outcomes. The final part of the paper examines the influence of policies and programs on inequalities in health outcomes, reviewing both studies that shed light on the effects of broad policies, such as whether patients have direct access to specialists or require a referral through a general practitioner, as well as the effects of specific programs, such as the UNICEF maternal and child health program of Ceara, Brazil.

## Acknowledgements

This paper grew out of various presentations to audiences in the World Bank, PAHO, DfID, the Argentine Health Economics Association, and elsewhere. I am grateful to the participants at these events for helpful ideas, and to Jeanette Vega and her colleagues for allowing me to cite their unpublished results on Chile. I am also grateful to my co-authors of the World Bank's Poverty Reduction Strategy Paper Sourcebook chapter on Health Nutrition and Population for allowing me include in this paper some material from an earlier draft of that chapter. None of these people is responsible for the contents of the paper, and the findings, interpretations and conclusions expressed in the paper are mine. They do not necessarily represent the views of the World Bank, its Executive Directors, or the countries they represent.

## 1. Introduction

The gaps in health outcomes between the low and middle income countries (LMICs) and the high income countries (HICs) are staggering. In several sub-Saharan African countries, for example, as many as 200 out of every 1000 children born will die before their fifth birthday. In Sweden, by contrast, the under-five mortality rate is currently only 5 per 1000 live births [1]. But it is not just the gaps between rich and poor countries. There are large gaps *within* countries too—even within *poor* countries. In Bolivia, for example, there is a fourfold difference between the under-five mortality rates prevailing amongst the poorest fifth of households and that prevailing amongst the richest fifth [2]. But the within-country gaps are not a fixture—in India and Kenya, for example, the overall under-five mortality rate is similar to that of Bolivia (around 100 per 1000 live births), but there are smaller (threefold and twofold respectively) differences in the rates prevailing in the bottom and top wealth quintiles [2]. Against this background of large but varying inter-country and intra-country gaps in health outcomes between the poor and better-off, it is reassuring that so much attention is now being devoted in the international development community to improving the health of the world's poor. Key international organizations in the health field—including the World Bank [3] and the World Health Organization [4]—now have the improvement of the health outcomes of the world's poor as their primary objective, as have several bilateral donors, including, for example, the British government's Department for International Development [5].

The growing interest within the international development community in improving the health of the world's poor reflects the ever broader interpretation being given to the term “poverty”. This, in turn, reflects trends within the academic literature [6] and the increasing tendency of aid agencies and non-governmental organizations to define their goals in terms of



poverty-reduction. This is much in evidence in the World Bank's own work. Poverty-reduction was adopted during the 1990s as the overriding mission of the organization, interpreted broadly in multidimensional terms and emphasizing the fact that health is a key dimension of poverty [7]. One important implication of this is that raising the incomes of the poor may not be enough to reduce "poverty" if it does not guarantee that the health of the poor is also improved. But the increasing focus on the health of the world's poor also reflects a growing consensus that inequalities in health outcomes between rich and poor are *unjust*—whether they be between the people of Sierra Leone and Sweden, or between poor Bolivians and better-off Bolivians [8]. Closing inter-country and intra-country gaps between the poor and better off, by securing greater proportional improvements amongst poorer groups, is not simply a poverty issue—it is also a question of social justice and equity. Indeed, it is this, rather than the emphasis on poverty-reduction, that has kept the debate on socioeconomic inequalities in health so buoyant in many of the HICs.

This paper provides a selective overview of the research to date on equity, poverty and health outcomes. The paper outlines some techniques for assessing the current situation and presents some data showing how the situation varies across countries. But the paper devotes most of its attention to the questions of how we explain the current situation, and how to design policies to improve matters.

## 2. Measuring and testing for inequalities in health

A useful starting point is the measurement of health inequalities. Having a measure of the gap in health outcomes between the poor and better-off is useful for a number of exercises—monitoring trends over time; evaluating the effects of policies; and benchmarking (comparing inequalities across similar countries).

### 2.1. The concentration curve and concentration index

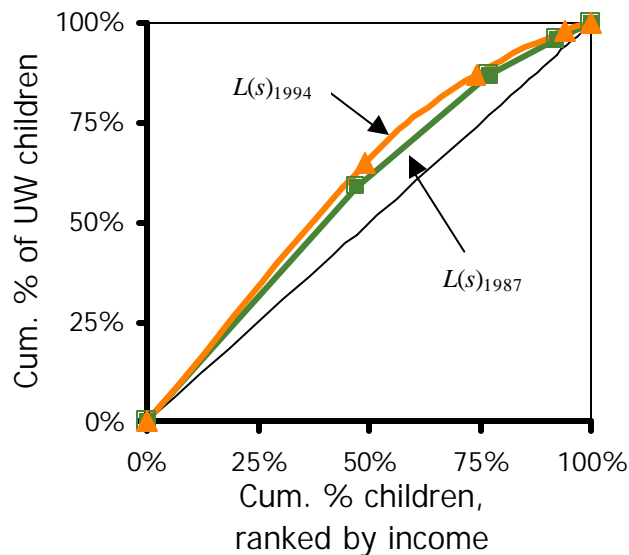
It is useful to use a specific example to motivate the discussion. In 1987, the local government in Ceara, Brazil, introduced an ambitious maternal and child health (MCH) program, which has been credited with the substantial improvements in MCH outcomes over the period 1987-94 [9]. One issue that arises, but which has until recently been left uninvestigated, is whether the program led to a narrowing of the inequality in MCH outcomes between the poor and better-off [10]. Or, to put it another way: did the poor experience proportionately larger improvements in their health than the better-off?

The curve labeled  $L(s)_{1987}$  in Fig 1 plots the cumulative proportion of children aged under five (ranked by their household income, beginning with the least advantaged) against the cumulative proportion of under-weight children in 1987. The markers on the curve corresponded to the four income groups underlying the data—the poorest group thus accounts for a full 50% of children in the Ceara sample. This ensures that the sizes of the groups being compared are taken into account. The curve, known as a *concentration curve* [11], lies above the diagonal (or line of equality), indicating that in 1987 inequalities in malnutrition favored better-off children in Ceara—the poorest 50% of children accounted for well over 50% of all malnourished children. Such inequalities are termed *pro-rich*. Had  $L(s)$  lay below the diagonal, inequalities would have

been *pro-poor*. The further  $L(s)$  lies from the diagonal, the greater the degree of inequality in malnutrition across income groups. The curve labeled  $L(s)_{1994}$  is the corresponding curve for 1994. This lies everywhere further from the diagonal than the curve for 1987. The curve for 1987 is said to *dominate* that for 1994, and it can be concluded that there was unambiguously less inequality across income groups in malnutrition in Ceara *prior* to the MCH program than there was after it had been in operation for seven years. The reduction in average levels of malnutrition appears to have achieved at the expense of a widening in the gaps in malnutrition between the poor and better-off children.

Figure 1: Malnutrition concentration curves, Ceara, Brazil

(Source: author's calculations based on data from [10])



In the Ceara case, the comparison is straightforward—inequality in 1994 was unambiguously higher than in 1987. Things become less straightforward when concentration curves cross, and when a large number of comparisons are being made, as might be the case in

an international comparative study. In such cases, inequality can be measured by the *concentration index*, denoted below by  $C$  and defined as twice the area between  $L(s)$  and the diagonal.  $C$  takes a value of zero when  $L(s)$  coincides with the diagonal and is negative (positive) when  $L(s)$  lies above (below) the diagonal.  $C$  can be computed in a number of ways, and standard errors can be computed enabling tests of significance to be performed—for example, on comparisons over time, or between countries [12]. In the case of Ceara, the value of  $C$  for 1987 is  $-0.1444$ , while the value for 1994 is  $-0.1854$ . Thus the indices confirm both pro-rich inequalities in each year and higher pro-rich inequalities in 1994 than in 1987.

## 2.2. Demographic factors and unavoidable inequalities

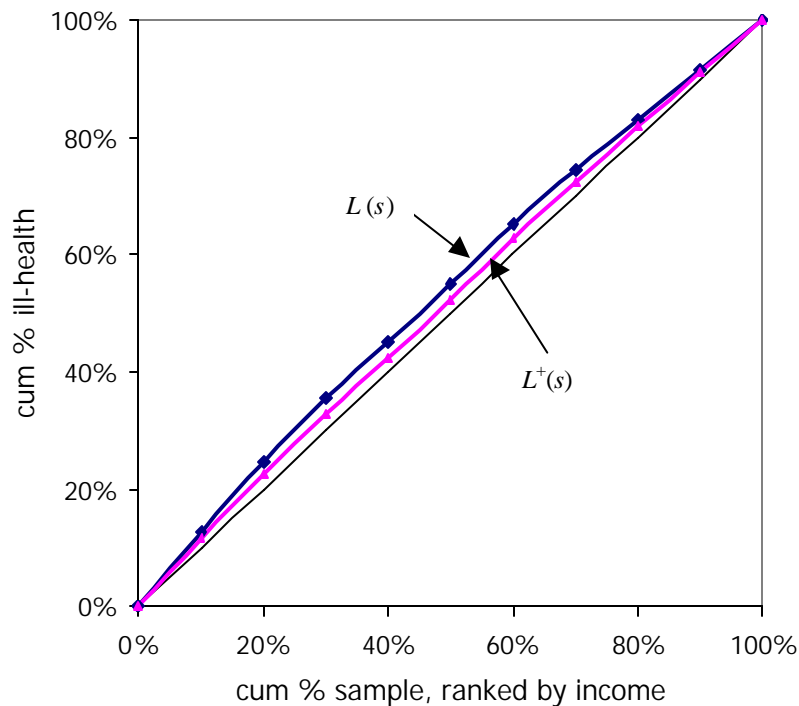
Comparing  $L(s)$  to the diagonal presupposes that all inequalities in ill health across income groups can be eliminated. This would be unrealistic if the groups varied in their average age. In the Ceara example above, this was not a major issue, since the children spanned only five years of age. But in the context of adult mortality or adult morbidity, it may well be an issue. It would certainly be unreasonable, for example, to suppose that a person of 85 could be made as healthy as a 20-year old. If older people are concentrated amongst the lower income groups,  $L(s)$  will lie above the diagonal simply because of (a) the link between age and ill-health and (b) the association between age and rank in the income distribution. For policy purposes, one might want to take (a) and (b) as given and view such effects as confounders. There are two ways of eliminating these effects and thereby obtaining a measure of the extent of “eliminable” health inequalities.

Again, an example might help to motivate the discussion. One interesting—and, as we will see below, under-researched—issue is whether inequalities across income groups in adult

health are higher in some countries than in others. In the HICs, a popular way of capturing adult health has been the question “In general would you say your health is: excellent, very good, good, fair, or poor?”. This has been found to predict well the onset of disability and subsequent mortality, and is considered by many to be a useful general measure of adult health available. This general self-assessed health (SAH) question is being included in an increasing number of health and multipurpose surveys in LMICs. One such country is Jamaica. The curve labeled  $L(s)$  in Fig 2 is the concentration curve for ill health for Jamaica in 1989, derived from the SAH question on the assumption that underlying the responses to the question is a latent ill health variable with a standard lognormal distribution [13]. The curve suggests that in 1989, inequalities in adult health in Jamaica favored the better off, though not substantially so.

*Figure 2: Ill-health concentration curves, Jamaica*

(Source: based on data in [14])



A problem with this conclusion, however, is that the inequality may simply reflect the tendency of the elderly to report worse health and the fact that the elderly tend to be concentrated amongst the lower income groups. The technique of demographic standardization provides an obvious way round this problem [12]. Two alternatives exist.

One possibility is the *direct method* of standardization. This requires grouped data, the groups in this case comprising the economic groups, and involves applying the age-sex-specific average ill health rates of each group to the age and gender structure of the population. In effect, the procedure “corrects” differences in morbidity or mortality rates across groups for demographic differences across groups. It does this by assuming that all groups have the same demographic composition, equal to the demographic composition of the population as a whole. A directly standardized concentration curve can then be constructed. This is shown, in the case of Jamaica, by the curve labeled  $L^+(s)$  in Fig 2. This lies below  $L(s)$ , indicating that part of the previously observed inequality in SAH between poor and better-off adults in Jamaica was indeed due to the confounding effects of age and/or gender. But  $L^+(s)$  lies above the diagonal, indicating that the less advantaged groups experience higher age-sex-specific ill health rates than the population as a whole. The opposite would have been the case if  $L^+(s)$  had been beneath the diagonal. Thus a measure of avoidable inequalities in health is twice the area between  $L^+(s)$  and the diagonal, which is denoted below by  $C^+$ . This is negative (positive) if avoidable inequalities in ill health favor the better off (poor), and is zero if there are no avoidable inequalities in ill health. In the Jamaican SAH case, the value of  $C$  is equal to  $-0.0756$  (with a t-ratio of 4.84), and  $C^+$  is equal to  $-0.0493$  (with a t-ratio of 3.79). Thus, taking into account the confounding effects of age and gender reduces the extent of pro-rich inequality in ill health, but does not eliminate it.

The alternative to the direct standardization is the *indirect standardization*. Unlike the direct method, it does not require the use of grouped data. This is an advantage, since the number of groups used will affect the numerical values of  $C$  and  $C^+$ .<sup>1</sup> The indirect method involves replacing person  $i$ 's degree of ill health by the degree of ill health suffered *on average* by persons of the same age and gender as person  $i$ . In effect, the procedure “corrects” differences in morbidity rates for demographic differences by assuming that everyone in a given demographic category has the same morbidity rate. The assumed rate is equal to the morbidity rate of the population for the demographic group in question. The corresponding concentration curve, denoted by  $L^*(s)$  but not shown in Fig 2, indicates the distribution of ill health across the income distribution that could feasibly be attained given the covariance between income and demographic factors. If the more disadvantaged members of society are in the demographic groups that are most prone to ill health,  $L^*(s)$  will lie above the diagonal, indicating that it is unreasonable to suppose that  $L(s)$  could ever be brought down as far as the diagonal. If, by contrast, the more disadvantaged members of society are in those demographic groups that are *least* prone to ill health,  $L^*(s)$  will lie below the diagonal, indicating that it would be feasible to bring  $L(s)$  below the diagonal. An alternative measure of avoidable inequalities in health is thus twice the area between  $L(s)$  and  $L^*(s)$ , denoted below by  $I^*$ . This index is simply the difference between  $C$  and  $C^*$ : i.e.  $I^*=C-C^*$ . The inequality index  $I^*$  is negative (positive) if there are avoidable inequalities favoring the better off (poor). In the case of Jamaica,  $C$  estimated on individual-level data is equal to -0.0919 (with a  $t$ -ratio of 14.03) while  $I^*$  is equal to -0.0345

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<sup>1</sup> If rates of ill health decline monotonically as one moves up through economic classes,  $C$  and  $C^+$  will be smaller (i.e. more negative) the larger the number of economic classes used, in much the same way as in the analysis of income inequality the Gini coefficient becomes larger the more income classes are used. The most accurate calculation of  $C$  is obtained, of course, when individual-level data are used, but since the direct standardization requires the use of grouped data this is not an option if it is avoidable inequalities in health one wishes to investigate.

(with a t-ratio of 6.39).<sup>2</sup> Again, the implication is that taking into account the confounding effects of age and gender reduces the estimated magnitude of inequality but does not eliminate it.

### 3. Health inequalities in LMICs

There is a long tradition of research in Europe on socioeconomic inequalities in health. As early as the first half of the 19<sup>th</sup> century, occupation was added to the death certificate in Britain. Tabulations of mortality rates by occupational group, along with commentaries, became a regular feature of the government's annual mortality reports [15]. Many other industrialized countries now have data on mortality and morbidity by occupational group or educational group, either from vital statistics systems or from longitudinal studies [16]. As a result, a large number of studies have been undertaken, many of which are comparative in nature [17, 18].

There are fewer data in HICs on inequalities in health by *income*, but there are some. Propper et al. [19], for example, examine trends in inequalities in various measures of ill-health across income groups in Britain, using the index  $C^+$  above. They conclude that inequalities in health in Britain disfavor the poor, and that—for most indicators—these inequalities increased over the periods 1974-82 and 1982-85, but then fell over the period 1985-87. Van Doorslaer et al. [20] compare inequalities in self-assessed health (SAH) in nine OECD countries, again using the index  $C^+$ . Their results are based on responses to the SAH question, which they cardinalize using the standard lognormal distribution assumption discussed in the Jamaica example above. The study finds significant pro-rich inequalities in all nine countries, and finds that the UK and US have significantly higher inequalities than the other countries studied. The study finds that

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<sup>2</sup> The increase in the absolute value of  $C$  associated with moving from grouped to individual-level data reflects the inevitable under-estimation of inequality when grouped data are used.



there are no significant differences in health inequalities amongst the mainland European countries.

There is far less material on socioeconomic inequalities in health outcomes for LMICs. But this is changing, especially for child health outcomes.

### 3.1. Health inequalities in LMICs amongst children

Wagstaff [21] reports inequalities in infant and under-five mortality across consumption groups for nine LMICs using data from the Living Standards Measurement Study (LSMS). Wagstaff and Watanabe [22] also use LSMS data to examine inequalities in child malnutrition across consumption groups for twenty or so LMICs. Many countries do not have an LSMS. An alternative in such cases is the Demographic and Health Survey (DHS), though for most countries this does not contain data on household income or consumption. Filmer and Pritchett [23], however, in their analysis of inequalities in educational attainment and enrolment, derive a wealth index for DHS households, by applying principal component analysis to information on housing characteristics (e.g. the material from which the roof and floor are made) and household durables (e.g. whether the house has a refrigerator). This method has been employed with DHS data by Bonilla-Chacin and Hammer [24] to explore inequalities by wealth in infant and under-five mortality, by Stecklov et al. [25] to explore trends in inequalities in child mortality in Uganda, and by Gwatkin et al. [2] to explore inequalities in infant and under-five mortality, malnutrition, and the incidence of diarrhea and ARI.

Figs 3 and 4 show some of the results from the study by Gwatkin et al. [2]. What the results show, unsurprisingly, is the tendency—throughout the developing world—of poor children to suffer higher rates of mortality and malnutrition than better-off children. What they

also show—and this is more surprising—is that countries vary markedly in the gaps in health outcomes between poor and the better-off children. Kazakstan, for example, has virtually no poor-nonpoor inequality in under-five mortality, whilst in Brazil the gap is very large.

*Fig 3: Levels and inequalities in under-five mortality in selected LMICs*

(Source: Gwatkin et al. [2])

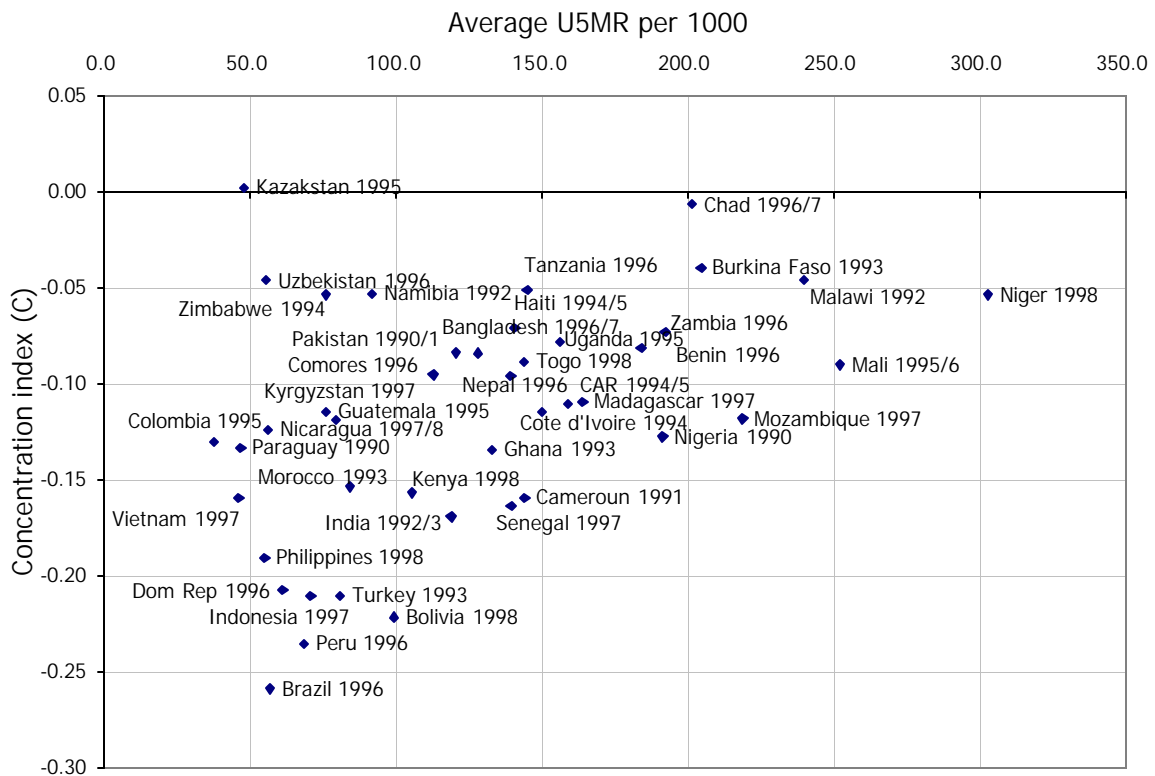
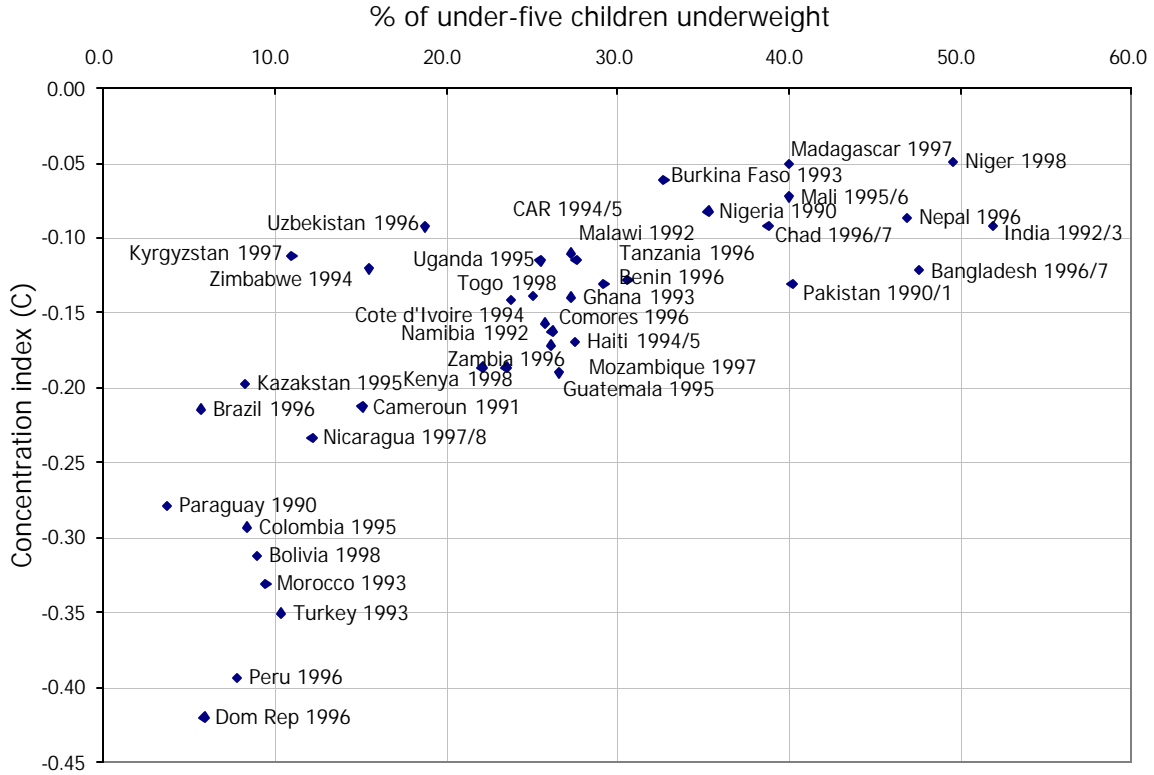


Fig 4: Levels and inequalities in underweight amongst under-five children in selected LMICs

(Source: Gwatkin et al. [2])



What is also evident in Figs 3 and 4 is the apparent trade-off between average health outcomes and the gap between the poor and the better off. For the most part, it is the countries with the lowest average rates of under-five mortality and malnutrition that have the largest gaps between poor and nonpoor children. It is not obvious why this should be the case. Contoyannis and Forster [26] provide some theoretical results that shed some light on the issue. Suppose, as seems to be the case, that the relationship between health and income is concave—i.e. subject to diminishing returns. Then, as Contoyannis and Forster show, low levels of income inequality will, *ceteris paribus*, be associated with high average levels of health but with *small* inequalities in health. If it is also the case that the elasticity of health with respect to income decreases as

income rises, then it follows too that high per capita incomes will also be associated, *ceteris paribus*, with high average levels of health but *small* inequalities in health. Insofar as per capita income and income inequality are negatively correlated, no tradeoff will be observed between average health and health inequality. Rather, the beneficial effects of high per capita income (on both the average level of health and health inequality) will be reinforced by the beneficial effects of low income inequality (on both the average level of health and health inequality). But neither should there be a tradeoff if per capita income and income inequality are *positively* associated. In this case, a high per capita income will make for a high average level of health and a low level of health inequality. But these effects will be offset by the fact that the high income inequality with which the high per capita income is associated will make for a low average level of health and a high level of health inequality. The tradeoff is therefore not simply a case of the countries in the bottom left corner being high-income high-inequality countries and the countries at the top right being low-income low-inequality countries. There is a result, however, in the Contoyannis-Forster paper that may explain the association, namely that policies that make the health-income relationship more elastic will tend to raise both average health *and* the level of health inequality. This would imply that what the countries in the bottom left hand corners of Figs 3 and 4 have in common is a highly elastic relationship between health and income. The countries in the top right hand corner, by contrast, have in common a highly *inelastic* relationship between health and income. Of course, this simply pushes the analysis back a stage, since it begs the question of what makes for a high or low income elasticity of health.

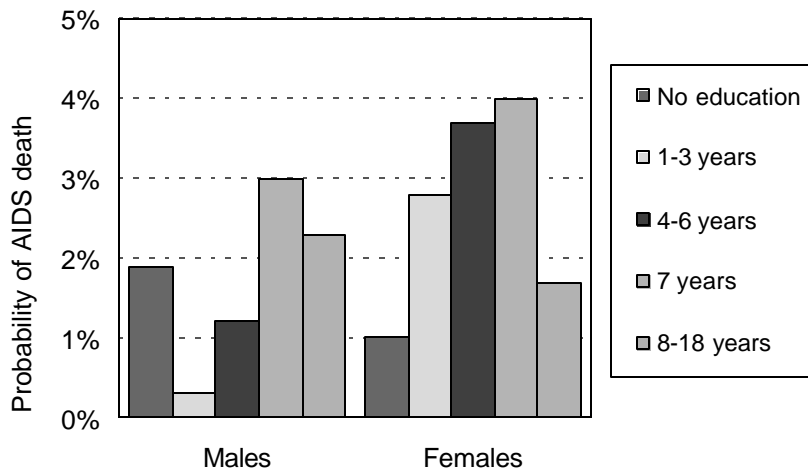
### 3.2. Health inequalities amongst adults

While the evidence for LMICs on socioeconomic inequalities in child health outcomes is growing apace, there is still relatively little evidence on inequalities amongst adults. In the case

of mortality, the problem appears to be a lack of data. Not many LMICs record a measure of socioeconomic status on the death certificate, and there are relatively few surveys that are large enough to allow socioeconomic inequalities in adult mortality to be measured. There are exceptions, however. Kunst [16], for example, examines inequalities in adult mortality across occupational and educational groups in the Czech republic, Estonia, and Hungary. Vega et al. [27] analyze inequalities in life expectancy by education in Chile for the years 1986, 1991 and 1995. They find relatively small pro-rich inequalities in each year (the largest value of the concentration index for their data is 0.017) and small increases over the period studied. In its volume *Confronting AIDS: Public Priorities in a Global Epidemic*, the World Bank [28] analyzes inequalities by education in the risk of death from AIDS in Tanzania. It finds different patterns for men and women, and in neither case is there a monotonic gradient (see Fig 5).

*Fig 5: Inequalities in risk of death of AIDS by education, Tanzania*

(Source:[28])



Information on inequalities in mortality is still fairly rare. Non-fatal information on adult health is more readily available. However, the data are often considered to be unreliable. For

example, Baker and van der Gaag [29] find that in Ghana, Jamaica, Peru and Bolivia (but not in Cote d'Ivoire), the better off were *more* likely than the poor to report themselves as ill. These results—and other similar results—are based, however, on responses to a question inquiring whether the respondent had been ill in the two (or four) weeks prior to the interview. This measure is highly subject to transitory factors, and tends to display very little gradient with income or any other measure of socioeconomic status in the industrialized countries either [30].

Measures such as chronic illness, disability and self-assessed health provide a more useful insight into inequalities in adult health in industrialized and developing countries alike. Fig 6 illustrates this for three developing countries using the inequality index  $I^*$ . In South Africa,  $I^*$  is positive and significantly different from zero for the presence of illness and the number of illness days in the last two weeks, indicating significant inequalities in favor of the poor. In Jamaica and Brazil, by contrast, there are inequalities in illness during the last four weeks to the *disadvantage* of the poor, but only in Brazil are they significant. By contrast, the longer-term illness indicators (long-standing illness and the presence of a major limitation) and the SAH indicator all point to significant inequalities to the disadvantage of the poor in Jamaica, while in Brazil, inequalities in SAH are substantially to the disadvantage of the poor, and significantly so.<sup>3</sup> The message seems to be that assessing inequalities in adult health is possible in LMICs providing meaningful health indicators are employed.<sup>4</sup>

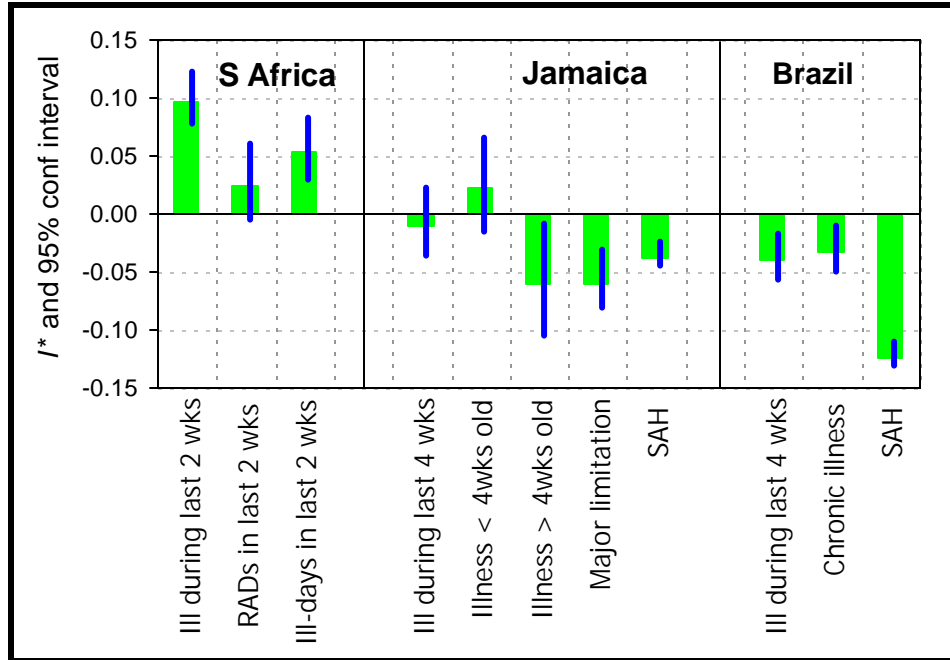
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<sup>3</sup> An alternative to these measures of morbidity would be an anthropometric measure, such as body mass index (BMI). There is, however, no information to date on inequalities in such measures, not least because the data required are often not collected for adults in household surveys.

<sup>4</sup> It may well be, of course, that the poor and better off do not share the same conception of health. As Sen [31] has put it, “people’s perception of illness varies with what they are used to, and with their medical knowledge. In places where medical care is widespread and good, people often have a higher perception of morbidity, even though they may in much better general health.” This would point towards there being a larger gap in “real” health between the poor and the better off than is apparent from the self-reported data. This idea is supported by the findings of Humphries and van Doorslaer [32], who find that the higher income groups in Canada reduce their self-assessment

*Fig 6: Inequalities in adult health*

(Source: author's calculations from LSMS data)



#### 4. Understanding health inequalities: a framework

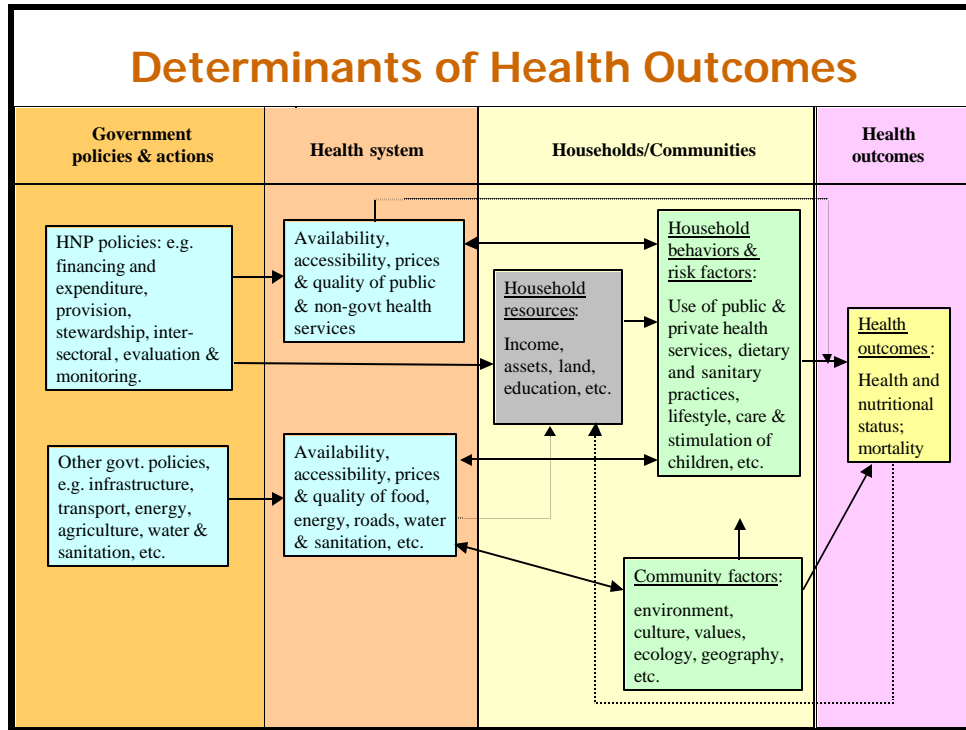
The results in section III suggest the existence in LMICs of inequalities in health to the disadvantage of the poor, not just in childhood but also in adulthood. Fig 7 sketches out an approach for conceptualizing the various routes by which health outcomes are determined and hence provides a framework for understanding health inequalities between the poor and better-off.

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of their health at a slower rate than the poor as their score on the McMaster health utility index increases. The expectations gap may itself vary from one country to the next, so that in a poor country with a wide income distribution like Jamaica the gap may be very wide, as the better off base their expectations on their experiences in a high quality private sector and the poor base their expectations on a poorly funded public system.

Fig 7: The determinants of health

(Source: Claeson et al. [33])



A variety of factors at the household and community levels have a direct influence on individual health outcomes. These are sometimes known as the *proximate determinants* of health [34] and are known in the economics literature as *health inputs* [35]. In the context of child health, these factors would include the use of appropriate preventive and curative health services, feeding and sanitary practices, maternal factors (such as the mother's age at the child's birth and the number of children she has given birth to), and the care and stimulation given to the child. In the context of adult health, health service utilization is important, as is diet, lifestyle (including cigarette and alcohol consumption), and so on. At the community level, the factors having a direct influence on health include the environment (water and sanitation conditions in the area surrounding the household's home, air quality, etc.), ecology, and geography.



The proximate determinants of health are not a fixture—they vary widely across households. For example, households vary in their use of curative and preventive services, their dietary and sanitary practices, when to have children and how many to have, and how much care and stimulation to give to their children. The first avenue to explore in seeking to understand the causes of inequalities in health outcomes is therefore to focus on the proximate determinants of health, or the health inputs. The key questions in the present context include: How far do the poor have worse proximate determinants than the better off? And, are the proximate determinants for which the inequalities are widest those that matter most for health? This issue is explored in section 5.

Answers to these questions provide only a partial answer to the question “Why do health inequalities exist?”. Suppose it is indeed the case that, for example, there are large gaps between poor and better-off households in certain key health inputs, such as immunization in the case of child health. This begs the question: Why? The framework in Fig 7 shows the proximate determinants of health as being influenced by three sets of factors—sometimes known as the *socioeconomic* or *underlying* determinants of health [34, 36, 37]. The household’s resources are one set of influences—these include not just their financial income and assets, but other physical assets (such as land, animals, etc.), as well as human “assets” in the form of knowledge, literacy, and education. It is not just the levels of these variables, but also their distribution within the household—especially the distribution between men and women. Households will also be influenced by the prices, quality, accessibility and availability of health services locally, as well as by the prices, availability and quality of other factors that impact on health outcomes, such as food, transport, and so on. Finally, households will be influenced by a variety of community-level factors. One example is the environment—good sanitary practices are harder if the water

and sanitation conditions in the community are poor. Another is the ecology and geography of the neighborhood—getting to a health center is harder if the roads are impassible during the rainy season. Also important potentially are less tangible factors such as the culture and values shared by the local community, as reflected in its social capital [38, 39].

These socioeconomic or underlying determinants of health—like the proximate determinants of health—vary from one household to the next. The second investigative avenue to explore in seeking to understand the causes of health inequalities is therefore to focus on the socioeconomic or underlying determinants of health. The key questions here include: How far do the poor have worse underlying determinants than the better-off? And, are the underlying determinants for which the inequalities are widest those that matter most for health? This issue is explored in section 6.

Although this question gets us further towards understanding the causes of health inequalities than simply looking at proximate determinants, it does not get to the *root causes* of health inequalities. Like the proximate determinants of health, the underlying determinants are not fixed. Suppose it turns out that a major reason for the inequalities in child survival between poor and better-off children is that poor children live in areas where the health facilities rarely have any drugs in stock. This begs the question: Why? Is it because of lack of resources? If so, is this because public expenditure levels are too low? Or because expenditures are biased away from the areas where poor people live? Or is it due to corruption on the part of health workers? There are many ways that policy—whether in the health sector or more generally—can influence the socioeconomic or underlying determinants of health. A third level of investigation, therefore, would be to focus on the impacts of policy and of the other factors that affect the underlying

determinants. These factors—which are, in effect, the root causes of health inequalities—are explored in section 7.

## **5. The proximate determinants of health inequalities**

### **5.1. What are the proximate determinants of health?**

There is now extensive evidence from the medical and health sciences on the factors that contribute directly to good health in childhood and adulthood. For example, for the five medical conditions responsible for most of the mortality and morbidity amongst children in the developing world, there is broad consensus on which preventive and curative health services are appropriate, as well as which dietary and sanitary practices are appropriate [40]. There is also good scientific evidence on the behaviors and risk factors associated with adult morbidity and mortality—both for communicable diseases, including HIV/AIDS, and non-communicable diseases, such as cancer and heart disease. This evidence has been reviewed elsewhere [33].

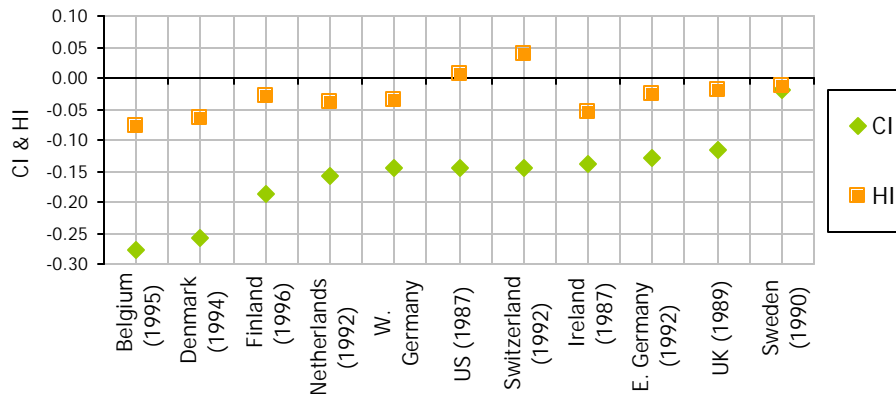
### **5.2. The distribution of health service utilization**

There is a tendency for the lower income groups in several OECD countries to use health services *more* than the better off [41, 42]. Fig 8 shows the concentration indices for overall utilization. This includes primary care visits, hospital outpatient visits and hospital inpatient days, each weighted by the unit cost of the public sector. The indices are negative in all countries, so it is apparently not the case that it is under-utilization by the poor *per se* that is a major factor in health inequalities in many of these countries. Having said this, there is the issue of whether the poor use services *sufficiently more* than the better off, given their apparently greater medical needs. Utilization may be unequally distributed in favor of the poor, but it still may be *inequitably* distributed in the sense that there is unequal treatment for equal need

(horizontal inequity) in favor of the better off. One way of trying to capture this is to compare the degree of inequality in utilization with the degree of inequality in medical need. If  $C_M$  is the concentration index for utilization, and  $C_N$  the index for medical need, an obvious measure of inequity is  $HI=C_M-C_N$  [43, 44]. These indices are also shown in Fig 8. The assumption here is that “need” can be measured by the utilization that one would expect for a particular individual, given his or her age, gender and health status. The picture for inequity is thus rather different for that of utilization—although the HICs manage to get health services to the poor reasonably well, in most cases this simply reflects the greater needs of the poor, rather than discrimination in their favor. Furthermore, in two countries—Switzerland and the United States—the poor do not apparently receive sufficiently more services to compensate for their greater medical needs.

*Fig 8: Inequalities and inequities in health service utilization in HICs*

(Source: [42])



The picture is far bleaker in the LMICs. A number of so-called benefit-incidence studies have been undertaken of health services [45-47]. These start by examining the distribution across

income quintiles or deciles of utilization of different types of public health facilities—primary care facilities, and hospital outpatient and inpatient facilities. The quintile averages are then multiplied by the public subsidy per unit of utilization for the facility-type in question. This indicates, for each quintile, the amount of subsidy received through utilization of the particular facility-type. By summing across all facility-types, one obtains—for each quintile—the overall average amount of public subsidy received through public expenditure on health services. Since each quintile is assumed to receive the same subsidy per unit of utilization, the subsidy shares for each facility-type simply reflect the utilization differences across quintiles. Thus the fact that in these studies the poor typically receive much less hospital subsidy than the better off simply reflects the fact that they use hospital services—especially inpatient care—less than the better off. By contrast, the gap between the poor and the better off in their use of primary care services is typically less marked. Both these patterns are shown in Fig 9, which shows the concentration indices for primary and hospital care for a number of countries. The overall subsidy distribution invariably favors the better off—often markedly so (see Fig 10). This reflects the heavy bias towards hospital spending in LMICs and the large pro-rich inequality in the utilization of these services.

Fig 9: Benefit incidence of public spending on primary care and hospital care

(Source: based on distributions given in Filmer et al. [45])

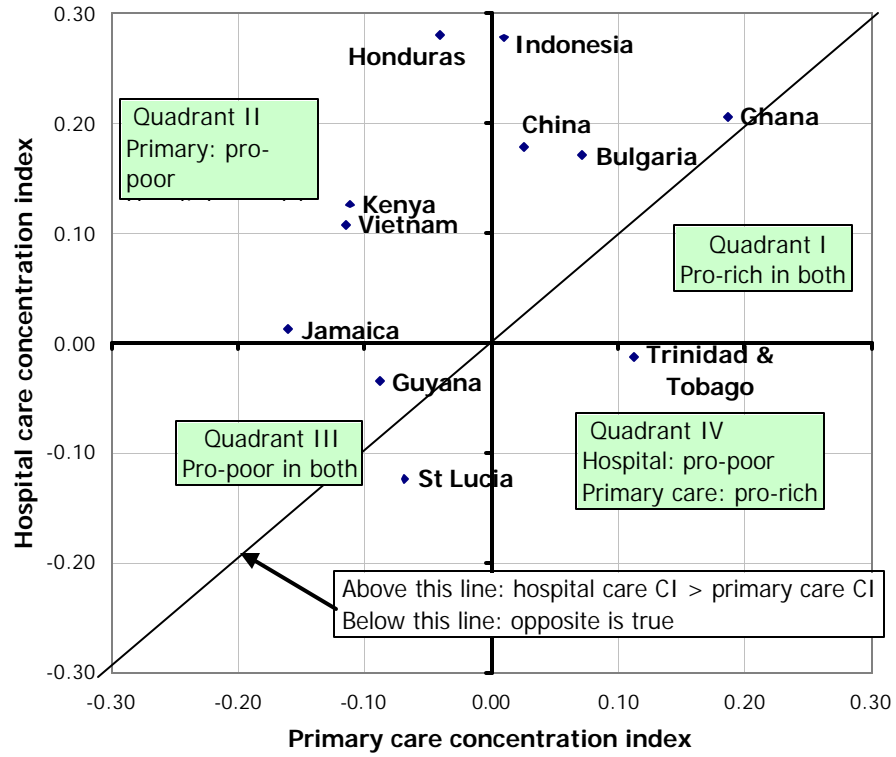
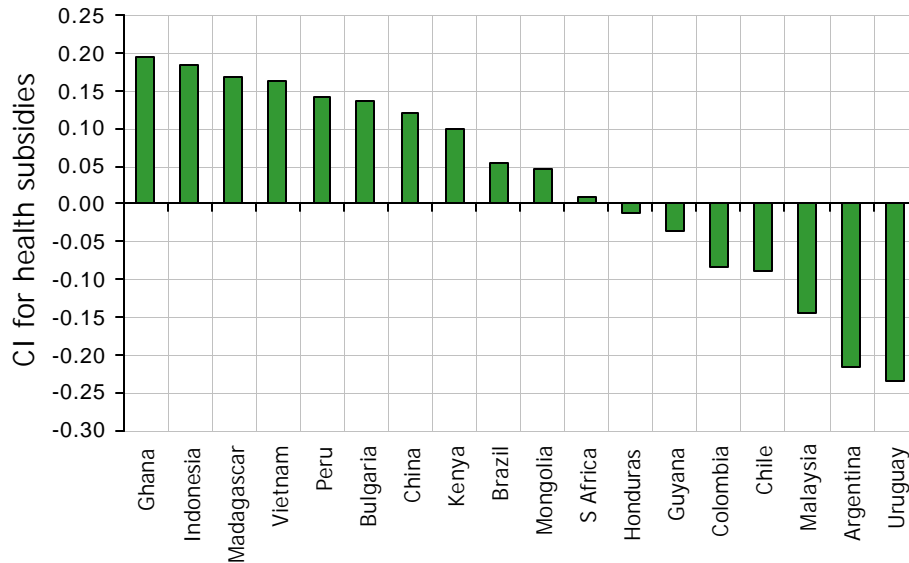


Fig 10: Benefit incidence of overall public spending on health services

(Source: based on distributions given in Filmer et al. [45])



In contrast, to the HICs, therefore, it *does* appear to be the case that inequalities in health outcomes may well be—at least partly—a reflection of the failure of health care services to reach the poor. This is reinforced by the findings from the study of Gwatkin et al. [2], which finds large differences in the usage of maternal and child health services. Figs 11 and 12 show some of these results. The pro-rich bias in immunization coverage in several of the countries is striking. From an equity standpoint, the appropriate benchmark for immunization coverage is, presumably, equality. By contrast, ORT use ought presumably to be distributed unequally in favor of poor children if they have a higher incidence of diarrhea. Fig 12 shows that it is indeed the case that diarrhea is concentrated amongst poor children—the concentration index is invariably negative. Despite this, many countries only manage to achieve a relatively small pro-poor bias in ORT use (the concentration index for ORT is usually larger than the concentration

index for diarrhea) and in some, ORT usage is actually *higher* amongst better-off children even though diarrhea is more common amongst poor children.

Fig 11: Level and inequality in immunization coverage in selected LMICs

(Source: [2])

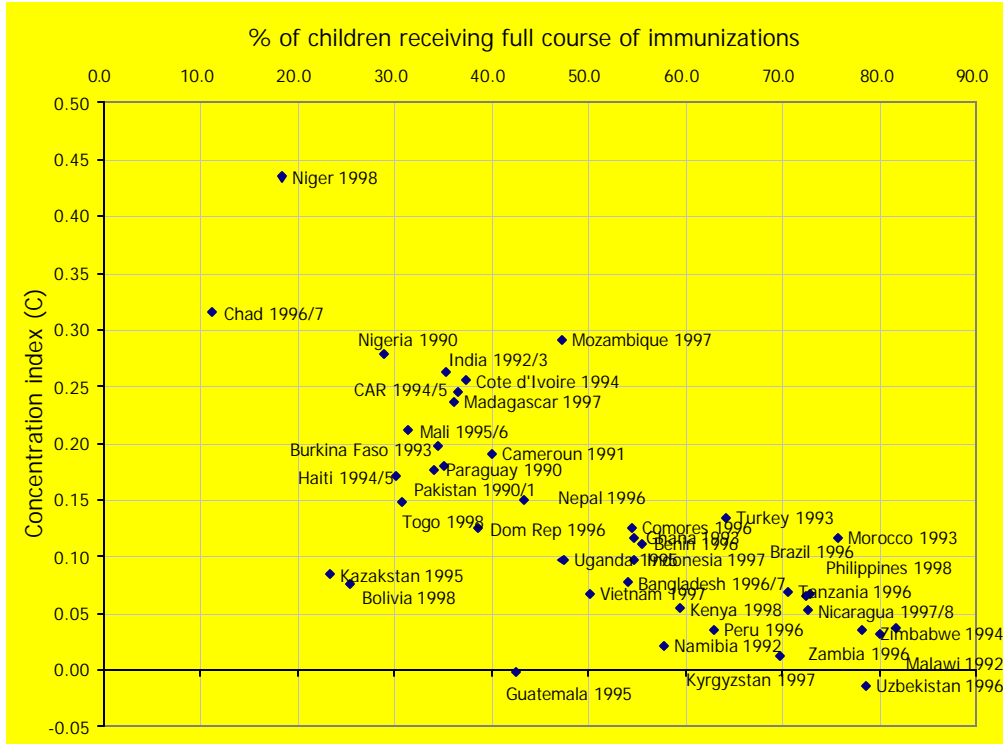
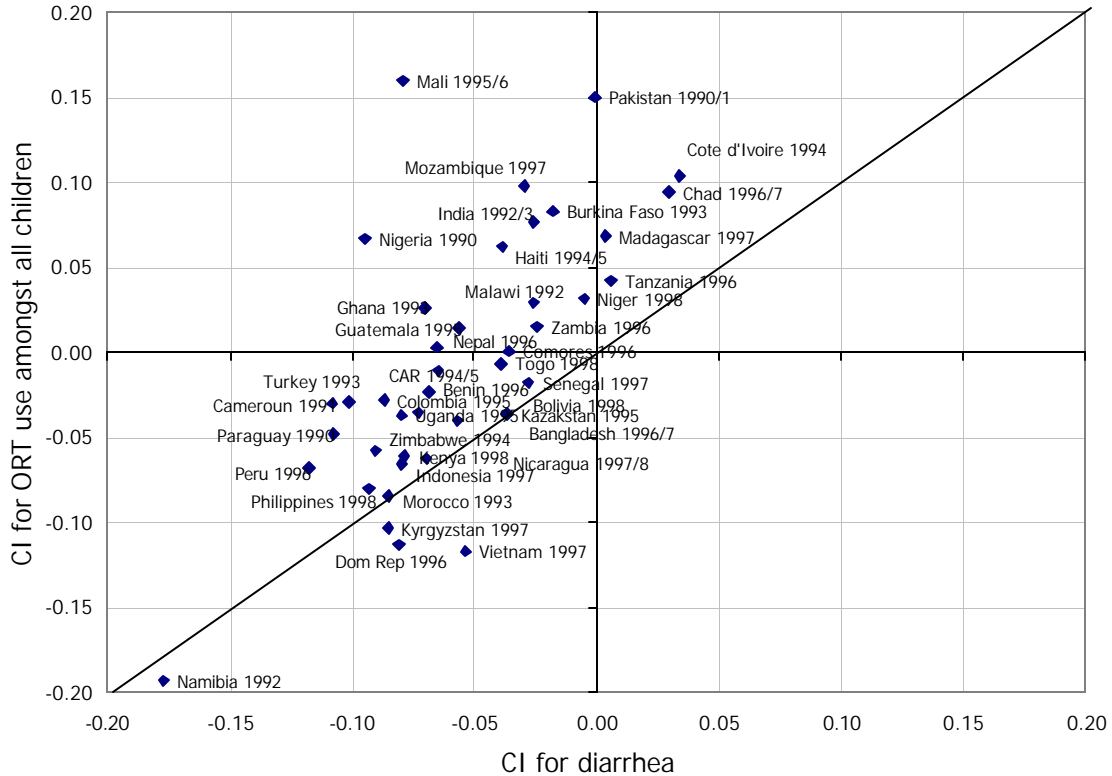




Fig 12: Inequality in diarrhea incidence and use of ORT in selected LMICs

(Source: [2])



### 5.3. The distribution of the other proximate determinants of health

Relatively little seems to have been written on socioeconomic differences in the other (i.e. non-medical) proximate determinants of health. Kunst [16] notes the higher levels of alcohol consumption amongst the lower socioeconomic groups in Finland and France, and in several eastern European countries. He also notes a tendency for smoking and poor diet to be concentrated amongst the lower socioeconomic groups in northern Europe and the US, but not in France and southern Europe. Marmot and Mustard [48] note that amongst blacks in South Africa, smoking is positively associated with socioeconomic status, whilst amongst whites the opposite is true.

#### 5.4. Explaining inequalities in health through inequalities in proximate determinants

Suppose that a particular proximate determinant of health—say, utilization of hospital services—is highly concentrated amongst the better-off. This does not necessarily mean that it is this inequality that is primarily responsible for the inequality in health outcomes. The contribution to inequality in health of a particular proximate determinant depends in part on its distribution across socioeconomic groups, but in part too on its impact on health. If hospital services do not have an especially strong impact on health, then the fact that they are unequally distributed in favor of the better off may not matter much when it comes to explaining health inequalities between the poor and better off.

Relatively little work has been undertaken trying to assess the relative contribution of the various inequalities in the proximate determinants of health to the inequalities in health itself. Studies in the HICs that shed light on the issue are the “Whitehall” studies of British civil servants. North et al. [49] sought to explain the strong inverse relation between grade of employment and sickness absence. Several risk factors were identified, including health-related behaviors (smoking and frequent alcohol consumption), work characteristics (low levels of control, variety and use of skills, work pace, and support at work), low levels of job satisfaction, and adverse social circumstances outside work (financial difficulties and negative support). The authors found that these risk factors accounted for only about one third of the grade differences in sickness absence. Marmot et al. [50] undertake a similar exercise for coronary heart disease. They find that smoking, lack of exercise and high blood pressure are more common amongst the lower civil service grades, but that cholesterol levels are higher amongst the higher grades. Grade differences in these risk factors account for only about 40% of the overall grade difference

in the risk of coronary heart disease, with differences in smoking being the single largest contributory factor.

## **6. The underlying determinants of health inequalities**

### **6.1. What are the underlying determinants of health?**

Fig 7 distinguished between three types of socioeconomic or underlying determinant—household-level determinants, community-level determinants, and health-system and related-sector determinants. From quantitative studies using survey data, as well as qualitative exercises such as focus groups and consultative exercises, a good deal is known about the factors that are important in shaping health outcomes.

At the household level, income (or, more broadly, financial wealth) and education are key determinants, though intra-household inequality (especially along the gender dimension) is also important. In LMICs, at least, as has been seen, the better off tend to use health services more frequently and to a greater degree than the poor. Indeed, they often demand not just more private sector care but also more public sector care [47]. The better off also often use modern providers rather than traditional practitioners [47]. Most dietary and child-feeding practices also improve with higher levels of income. Good sanitary practices—e.g. hand-washing and disposal of feces—are also usually positively associated with income. Income is often associated as well with the number of children a woman has and the age at which she has her first child. Higher income households also typically provide greater stimulation to children.

Education leads to better health outcomes, even after controlling for the higher household income that usually goes hand in hand with higher levels of education. For example, education

(especially that of women) is strongly associated with the level of health service utilization, the type of provider, the choice of private versus public provider, dietary and child-feeding practices, and sanitary practices [36]. It is not just general education, but also health-specific knowledge that matters. A recent study in Morocco [51] suggests that, by themselves, general numeracy and literacy do not—at least in Morocco—lead to better child nutrition. What enables women to achieve higher levels of nutrition for their children is the fact that they are able to use their general knowledge and skills to acquire health-specific knowledge.

Lack of control by women over household resources often harms health outcomes for them and for their family. In many countries, women have only a very limited degree of control over household financial resources, and frequently—though not always—have lower levels of literacy and education. Often these inequalities get translated into inequalities in the control over household decisions relevant to health outcomes. The area of family planning is an obvious example—where women have a low degree of control in the household generally, they tend to exercise relatively little control over the number of children they have and their timing. But there is also a beneficial impact on nutrition outcomes of female control of household resources.

Moving to the next level of socioeconomic or underlying determinants, community influences matter too. Ecology and geography obviously matter—getting to a health center is harder if the roads are impassible during the rainy season. The environment also matters—for example, good sanitary practices are harder if the water and sanitation conditions in the local community are poor. Communities often share similar values and norms, and these shared values—through peer pressure—often play a large part in shaping health behaviors [52]. Social pressures amongst teenagers is one example—pressures to take up smoking, to drink alcohol, to use addictive drugs and to engage in violent activities. Attitudes towards women are also

important. A variety of social norms and practices influence women's access to resources (inside and outside the household), such as land, extension services and credit (as well as their decision-making power in the household). These influence the time and energy cost of women's work related to household production and reproduction, placing a direct burden on them and limiting their capacity to engage in productive work, to seek health care, and to devote time and energy to child care. Community influences on household behaviors often operate indirectly through the institutions in communities, such as civic youth clubs, women's groups, and other civic associations. These groups often play a key role in mobilizing community action for better health and nutrition. The term "social capital" is sometimes used to describe the norms and networks that facilitate collective action—such as the setting-up of a community nutrition program. There are three key layers of social capital: ties within the community ("bonding"), relations between members of different communities ("bridging"), and connections between communities and formal institutions ("linking") [52]. There is some evidence—at least for the United States—that social capital may be important in shaping health [38, 39].

Moving to the health-system determinants, there is a good deal of evidence on the impacts on health outcomes and health service utilization of service availability, accessibility, prices and quality. Availability—defined in terms of e.g. staff in local health facilities—often emerges as an important determinant of service utilization and health outcomes [53-55]. Accessibility—the ease with which people can get to facilities—also emerges as important. One important dimension of this is travel time. This depends on the distance households have to travel, but also the transportation system, the road infrastructure, and geography. Distance is the most frequently encountered variable in empirical studies of utilization and often has a significant impact on utilization and health status [53, 56-59]. Price also influences utilization

behavior and health outcomes. A higher money price tends to reduce utilization, especially amongst the poor, unless accompanied by improvements in service quality [60]. By the same token, insurance tends to raise the usage of health services [61, 62]. The quality—or more exactly the perceived quality—of health services also influences usage. Studies of willingness-to-pay for changes to health services put quality improvements near the top of the list of things respondents are willing to pay for [60]. Unsurprisingly, the better off are “willing” to pay more for quality improvements than the poor, but willingness to pay for quality improvements is still significant amongst the poor. Measures of perceived quality—e.g. the availability of drugs, opening hours, and the training of staff—do appear in practice to influence households’ demand for health services and to impact on health outcomes [53, 59, 60, 63].

Moving finally to the box labeled “supply in related sectors” in Fig 8, it is clear that the availability, accessibility, prices and quality of other key services also influence household health-related behaviors and hence health outcomes. There is some—but mixed—evidence that food prices and distance to a food market influence child survival and malnutrition [53, 56, 64]. There is also evidence that local water and sanitation conditions influence child health outcomes [53, 55, 65-67].

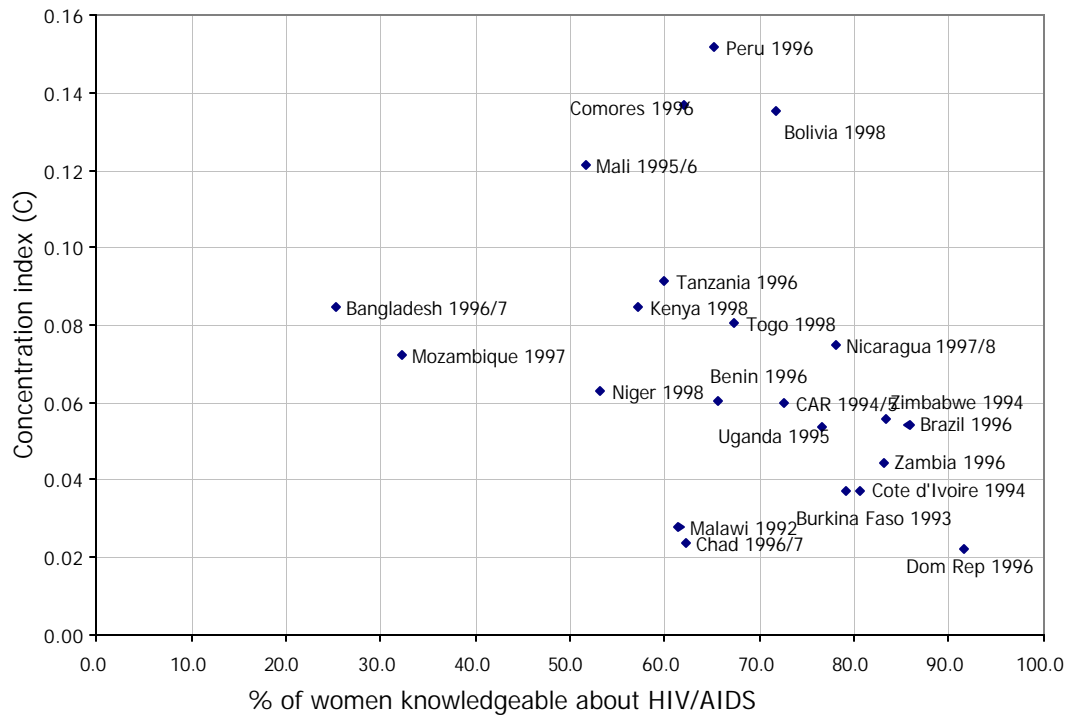
## 6.2. The distribution of the underlying determinants of health

At the household level, the obvious source of inequality in health outcomes is household income. Income inequality varies considerably across LMICs, ranging from Gini coefficients in the 0.20-0.30 range in some of the eastern European countries to around 0.60 in Brazil, Sierra Leone and South Africa. Another key factor at the household level is the unequal distribution of education—especially mother’s education. Filmer and Pritchett [23] show how much lower the

educational enrolment and attainment of the poor is in many countries, but also how the inequality varies across countries. Furthermore, and especially relevant for child health, the inequality by wealth is usually larger for girls than for boys, and is almost always larger in west African countries [68]. But it is not just general education that is unequally distributed. Health-specific knowledge is highly unequally distributed between the poor and the better off. Fig 13 shows the large gaps in knowledge about HIV/AIDS between poor and better-off women. In some cases, the large gaps are in countries where HIV prevalence is fairly low (e.g. Bolivia, Mali and Peru). But there are large gaps in high-prevalence countries too, notably the Central African Republic, Kenya, Mozambique, Tanzania and Zimbabwe. Intra-household inequality—especially along the gender dimension—also tends to be greater amongst poorer households.

*Fig 13: Inequality in knowledge about HIV/AIDS amongst women in selected LMICs*

(Source:[2])



At the community level, too, it is clear that the poor are disadvantaged. For example, they are more likely than the better-off to live in remote areas where the roads become impassable at certain times of the year. Social pressures amongst teenagers tend to be strongest in poor communities, and attitudes towards women tend to be less favorable to good health outcomes in poor communities. In terms of social capital, the poor tend to have a lot of “bonding” social capital, a moderate amount of “bridging” social capital, but very little “linking” social capital [52].

At the health system level, the poor are further disadvantaged. Taking into account population size, the poor may not always be at a disadvantage in terms of availability of some facilities—e.g. primary health facilities—but are clearly at a disadvantage in terms of *accessibility*, tending to have to travel further [63] and for longer [47]. Quality of care—interpreted broadly to include service and amenities, as well as technical quality—also tends to be lower in facilities serving the poor. This is not always easy to measure. Official statistics often provide information on the availability of drugs, medicines, growth monitoring and immunization programs, and so on, but these often paint a rosier picture of quality than is warranted. A facility survey in Côte d’Ivoire [58] found a substantial divergence between drugs and medicines that were supposed to be available, according to government records, and those that were actually available, according to the facility survey. These data revealed clear gaps between poor rural areas and better-off urban areas in the proportions of facilities with immunization and growth monitoring programs. Finally, the poor often face a higher price at the point of use than the better off, simply because they are less likely to have insurance coverage. This is sometimes offset by fee-waiver schemes but in practice these often end up exempting the near-poor from fees rather than the poor [69].



Survey data also often reveal some large differences between poor and nonpoor households in availability of good drinking water and sanitation. It is not just type and location of drinking water source that varies by economic status—often the poor pay more in terms of money (piped water is often subsidized) and time (poor women especially have to walk long distances to collect water).

### 6.3. Explaining inequalities in health through inequalities in underlying determinants

In just the same way as one cannot conclude from socioeconomic distributions alone which proximate determinants are central to understanding the causes of health inequalities, so too is it impossible to conclude which socioeconomic determinants are most relevant simply by looking at their distribution across, say, income quintiles. As before, what is required is a framework linking distributional information to estimates of the impacts of the various socioeconomic determinants on health outcomes. An example of a study that tries to do this is a recent analysis of the underlying causes of inequalities in childhood survival in Cebu, the Philippines [67]. This identified several significant determinants of child survival, including mother's education, household income, health insurance coverage, drinking water availability, sanitation conditions, travel time (or distance) to various health service facilities, staffing levels in local primary care facilities, and the availability locally of vitamins, vaccines, ORT and female contraceptives. Most important amongst these, in terms of its contribution to survival inequalities between poor and non-poor children, was income. Inequalities in mother's education were also found to be a major factor. Inequalities in health service availability were found to be relatively small, so that although they were found to be important influences on the *average* child's survival prospects, they did not help explain survival differences between poor and non-poor children. This is unlikely to be the case in all countries—it is likely that there is cross-

country variation in the relative importance of inequalities in different underlying determinants of health.

## **7. Public policy and health inequalities**

### **7.1. What public policies impact on health inequalities?**

Through their policies in and outside the health sector, governments have a potentially large impact on health levels generally but especially on the gap in health levels between the poor and better off. Claeson et al. [33] propose a framework for thinking about these effects, building on the conceptual framework proposed in the WHO's recent World Health Report [70]. The framework outlined by Claeson et al. shows how each area of government policy affects each of the various socioeconomic and health system determinants of health outcomes highlighted in Fig 7. The areas of policy include: (i) health expenditure allocations, (ii) financing and revenue raising, (iii) provision and service delivery, (iv) stewardship, (v) monitoring and evaluation, and (vi) policies outside the health ministry. The term "stewardship" covers policymaking and policy implementation, regulation, and quality assurance, in both the public and private sectors. The "policies outside the health ministry" would include a number of policy areas such as education, social protection, energy, environment, transport and infrastructure.

In principle, policy in each area can have an impact on each of the various socioeconomic and system determinants of health. However, in practice some policies will impact on some socioeconomic determinants more than on others. Through their spending decisions—how much they spend overall, how they allocate expenditures across different sectors, how much they spend on different programs and different inputs, how they allocate expenditures geographically, etc.—

governments influence the availability, accessibility and quality of health services is the areas in which poor people live. Through their financing and revenue-raising decisions, they influence the price of health services, the level of any fee exemption for the poor, and the impact of any financial protection payments on their income. Through their policies on service provision and delivery within the public sector, governments affect the accessibility, availability and quality of public services, and can influence households' knowledge of health issues. Through the stewardship function, governments can have a major impact on the non-government sector, by, for example, working with community and non-governmental organizations to improve health services for the poor, and by influencing the price structure of the non-government sector.

Very little academic research has been undertaken that enables comparisons to be made of the intended and unintended impacts of government policies on health inequalities. Rather, the evidence tends to be very piecemeal. For example, it might be argued—and often is [71]—that travel time to health facilities influences the utilization of facilities, that the poor have to travel for longer than the better off, that transport policies can influence travel time, and therefore improving transport systems ought to be one of the measures taken to help reduce health inequalities. What is missing from such claims is evidence showing that governments with pro-poor transport policies do indeed manage to achieve smaller gaps between the poor and better off in health outcomes, and that such policies produce larger impacts, per dollar of taxpayer's money spent, than other policies.

A limited number of studies have, however, been undertaken that shed some light on the impact of policies on health inequalities. These include some broad-brush studies trying to link government policies to health inequalities and utilization inequities, and some micro-based work

trying to evaluate the impact of specific interventions and programs on the health and health service utilization of the poor.

## 7.2. Research on the impact of policies on health inequalities

Van Doorslaer et al. [20] explore the role of four factors in influencing the level of health inequality in selected OECD countries. Two relate to health expenditures—the level in per capita terms, and the public share. The others relate to policies outside the health ministry—the level of income per capita, and the inequality in per capita income. The authors regress concentration indices capturing levels of health inequality amongst adults on these four variables for nine OECD countries. They find that neither total health care expenditure per capita, nor the percentage spent publicly, has any statistical association with health inequality. Of the two income variables—the GDP per capita and the Gini coefficient of income inequality—only the latter proved to bear a consistent and significant positive association with health inequality. It appears, therefore, that income-related inequality in health is more associated—in these countries, at least—with the distribution of income in a society than to its aggregate income level or its levels of health spending. This is, however, a small sample of OECD countries and the variables included do not capture very well the various dimensions of the health policies of the countries analyzed.

The results of Bidani and Ravallion [72] imply somewhat different conclusions. They find that at both one-dollar-a-day and two-dollar-a-day poverty lines, public health spending has a larger impact amongst the poor than amongst the nonpoor, and that female education enrolment has a larger impact amongst the poor at \$2 a day but a *smaller* impact at \$1 a day. By having a larger impact on the poor, public health spending thus serves to reduce health inequality between

the poor and nonpoor. The same is true of female education at \$2 a day, but not at \$1 a day. The implication is that countries that have small gaps between the health of the poor and nonpoor do so because they have high levels of public spending on health and high female education enrolment (in the case of the \$2 poverty line).

Van Doorslaer et al. [42] explore the extent to which the cross-country differences in inequality and inequity in health care utilization in Fig 8 reflect health system features. They find some evidence that the results may reflect differences across countries in how the poor and better off fare with respect financing and revenue-collection. In Belgium and Ireland, the lower income groups tend to be exempt from copayments for general practitioner (GP) care, and it is precisely in these two countries that the distribution of GP utilization is most pro-poor. The impact of insurance coverage is less evident. There is some evidence that the poor in the US do less well than they ought, given their need, which might be thought to be at least in part to lack of health insurance coverage. But the same happens in East Germany (as it then was), Denmark and Sweden, all of which have universal and comprehensive public insurance coverage. There is some evidence, however, that the characteristics of the delivery system get reflected in the distribution of utilization across income groups. The authors suggest, for example, that differences across the Dutch income distribution in how specialists get paid—salary for the poorer sickness fund members, fee-for-service for the better-off privately insured—may be a factor behind the tendency for the better-off to have higher specialist visit rates. There is, however, no strong evidence of any distributional of a GP gatekeeper scheme. It might be thought that by requiring patients to be referred to a specialist, the system could better target resources on those who need them most and reduce the tendency of the better off to secure more resources than merited on the basis of need. In many countries, the distribution of specialist

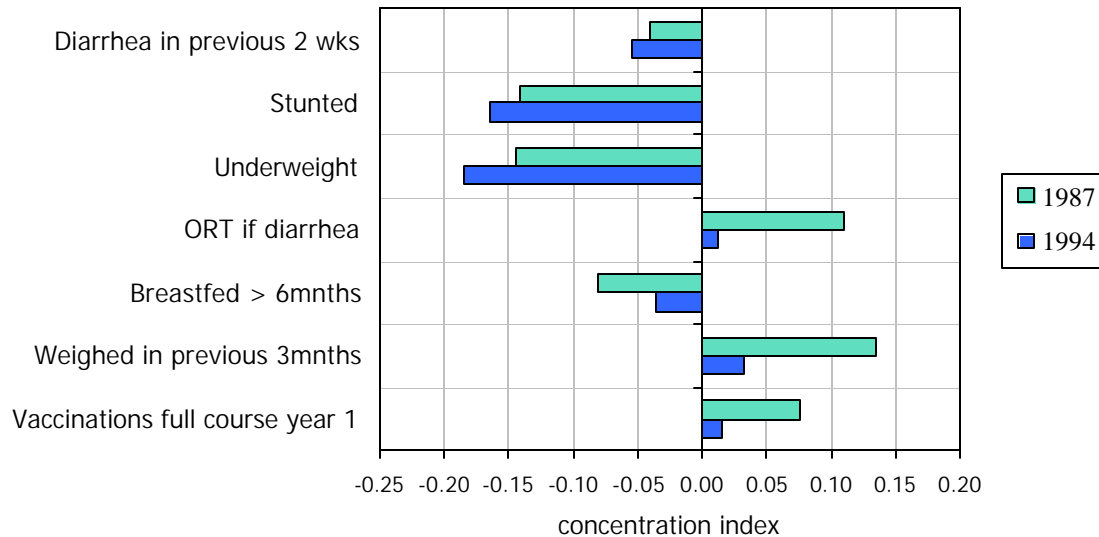
visits—even after controlling for need—is indeed found to be pro-rich, but this happens both in countries where the GP acts as a gatekeeper and in countries where patients can go directly to a specialist.

### 7.3. Research on the impacts of specific programs on health inequalities

One study examining the distributional impact of a specific program has already been mentioned in section II—the evaluation of the Ceara initiative by Victora et al. [10]. This program aimed at improving maternal and child health outcomes in rural Brazil, and placed a strong emphasis on building trust between government health workers and the poor [9]. The initiative resulted in some substantial improvements in average service usage and health outcomes. The distributional data presented by Victora et al. are simply before-and-after data, the implicit counterfactual being persistence of the status quo. Nonetheless, the results are interesting. As is clear from Fig 14, which reworks their data into concentration indices, the initiative substantially reduced the inequality between poor and better-off children in vaccination coverage, weighing and ORT use. Despite this, there was a widening in the gap between poor and better-off children in all three outcomes (the prevalence of diarrhea, stunting and underweight). It seems likely that this was caused, in part, by the reduced pro-poor inequality in breastfeeding—women in all income groups were more likely in 1994 than in 1987 to have breastfed their child for at least six months, but the increase was substantially higher amongst better-off women.

*Fig 14: Inequalities in service use and child health outcomes, Ceara, Brazil*

(Source: Derived from data reported in [10])

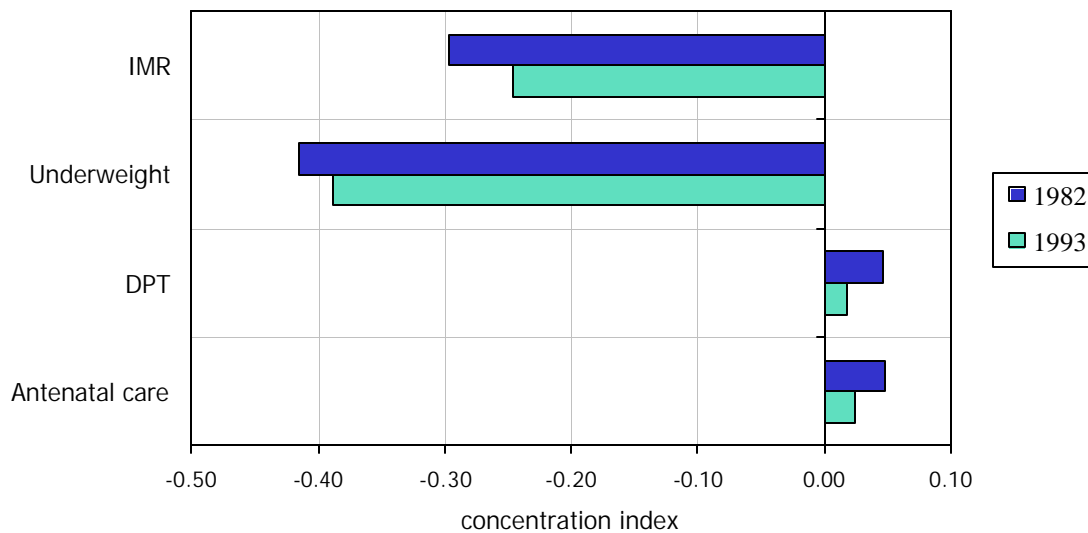


In the same paper, Victora et al. also examine the combined impact of a variety of programs introduced in the Brazilian city of Pelotas over the period 1982-93. These included a large increase in the number of first-line government health facilities, the introduction of three neonatal care units, and a general increase in government expenditure on preventive and curative health. Over the period, the IMR fell from 38.9 to 20.9, and the prevalence of underweight fell from 6% to 4%. These were accompanied by increases in the proportions of pregnant women receiving antenatal care (from 85% to 91%) and children receiving three doses of DPT in their first year of life (from 83% to 90%). Victora et al. present data that allow the distributional impact to be assessed, the implicit counterfactual being, as before, persistence of the status quo. Fig 14 presents their results in the form of concentration indices. As is clear, the decade saw substantial reductions in the inequality between poor and better-off children in vaccination coverage and receipt of antenatal care. These improvements were accompanied by reductions in

the gap between poor and better-off children in the prevalence of underweight and the IMR. However, the percentage reductions in inequality in these two outcomes (6% and 17% respectively) were much smaller than the percentage reductions in inequality in DPT coverage and antenatal care receipt (61% and 51% respectively).

*Fig 15: Inequalities in service use and child health outcomes, Pelotas, Brazil*

(Source: Derived from data reported in [10])



## 8. Conclusions

As is apparent from the foregoing, there is a good deal that *is* known in the field of equity, poverty and health outcomes, but there is more that is *not* known.

On the measurement of health inequalities and health service inequities, a good deal is known. Indices are available, as are standard-error estimators, enabling significance tests to be undertaken on survey data. On evidence on health inequalities and health service inequities in the developing world, a fair amount is known. There is extensive evidence now on inequalities in



health outcomes for child health outcomes, though much less on adult health outcomes. A good deal is known about inequalities in health service utilization, both utilization generally and utilization of child health services. Less is known about the inequalities in the other proximate determinants of health—feeding and sanitary practices, etc.—and virtually nothing seems to be known in the developing world about the extent to which inequalities in different proximate determinants of health are responsible for inequalities in health outcomes. There is evidence on inequalities in the socioeconomic or underlying determinants of health, but this evidence is scattered and does not lend itself to making comparisons between inequalities in, say, accessibility and inequalities in, say, insurance coverage. There has been very little work to date that enables inequalities in health to be decomposed into inequalities in the various socioeconomic determinants. Far too little empirical work has been undertaken on the impact of policies and programs on health inequalities. There is mixed evidence on whether public spending on health and promoting female education reduces health inequalities. There is some evidence from the OECD countries that exempting the poor from user charges for primary care promotes a pro-poor utilization pattern, but the OECD evidence on the impact of insurance coverage on inequalities in health service utilization is mixed. There is some evidence that variations in provider-payment systems for patients at different income levels is reflected in the distribution of utilization by income, but little evidence that using a GP as a gatekeeper promotes equity in utilization. Limited evidence is available on the distributional impact of specific programs. The Ceara initiative in Brazil seems to have been associated with widening gaps in health outcomes between the poor and the better off, while the programs introduced in Pelotas, Brazil, over the period 1982-93 were associated with a narrowing in child health gaps. In neither

case, however, were there any controls, so one should be cautious about attributing the changes to the programs.

## References

1. World Bank, *World Development Indicators 2000*. 2000, Washington DC: The World Bank.
2. Gwatkin, D., S. Rutstein, K. Johnson, R. Pande, and A. Wagstaff, *Socioeconomic Differences in Health, Nutrition and Population*. 2000, The World Bank: Washington DC.  
<http://www.worldbank.org/poverty/health/data/index.htm>.
3. World Bank, *Health, Nutrition and Population Sector Strategy*. 1997, Washington DC: The World Bank.
4. World Health Organization, *The World Health Report 1999: Making a Difference*. 1999, Geneva: The World Health Organization.
5. Department for International Development, *Better Health for Poor People*. 1999, London: Department for International Development.
6. Sen, A., *Development as Freedom*. 1999, New York: Knopf.
7. World Bank, *World Development Report 2000/2001: Attacking Poverty*. 2000, Oxford, New York: Oxford University Press.
8. Le Grand, J., *Equity and Choice*. 1991, New York: Harper Collins.
9. Tendler, J. and S. Freedheim, Trust in a rent-seeking world: health and government transformed in Northeastern Brazil. *World Development*, 1994. **22**(2): p. 1771-1791.
10. Victora, C., F. Barros, J. Vaughan, A. Silva, and E. Tomasi, Explaining trends in inequities: evidence from Brazilian child health studies. *Lancet*, 2000. **356**(9235): p. 1093-8.
11. Wagstaff, A., P. Paci, and E. van Doorslaer, On the measurement of inequalities in health. *Social Science and Medicine*, 1991. **33**: p. 545-557.
12. Kakwani, N., A. Wagstaff, and E. Van Doorslaer, Socioeconomic inequalities in health: Measurement, computation and statistical inference. *Journal of Econometrics*, 1997. **77**(1): p. 87-104.
13. Wagstaff, A. and E. Van Doorslaer, Measuring inequalities in health in the presence of multiple -category morbidity indicators. *Health Economics*, 1994. **3**: p. 281-291.
14. Wagstaff, A. and E. van Doorslaer, *Inequalities in health: Methods and results for Jamaica*, in *Health systems inequalities and poverty in Latin America and the Caribbean*, E. Greene, J. Zevallos, and R. Suarez, Editors. 1999, Pan American Health Organization/World Bank: Washington DC.
15. Whitehead, M., William Farr's legacy to the study of health inequalities. *Bulletin of the World Health Organization*, 2000. **78**(1): p. 86-87.
16. Kunst, A., *Cross-National Comparisons of Socioeconomic Differences in Mortality*. 1997, Den Haag: CIP-Gegevens Koninklijke Bibliotheek.

17. Mackenbach, J.P., et al., Socioeconomic inequalities in morbidity and mortality in western Europe. *Lancet*, 1997. **349**: p. 1655-9.
18. Pappas, G., S. Queen, W. Hadden, and G. Fisher, The increasing disparity in mortality between socioeconomic groups in the United States, 1960 and 1986. *New England Journal of Medicine*, 1993. **329**(2): p. 103-9.
19. Propper, C., R. Upward, and J. Le Grand, Need, Equity and the NHS: The Distribution of Health Care Expenditure 1974-87. *Fiscal Studies*, 1992. **13**(2): p. 1-21.
20. Van Doorslaer, E., A. Wagstaff, H. Bleichrodt, and a. others, Income related inequalities in health: some international comparisons. *Journal of Health Economics*, 1997. **16**: p. 93-112.
21. Wagstaff, A., Socioeconomic inequalities in child mortality: comparisons across nine developing countries. *Bulletin of the World Health Organization*, 2000. **78**(1): p. 19-29.
22. Wagstaff, A. and N. Watanabe, *Socioeconomic inequalities in child malnutrition in the developing world*, Policy Research Working Paper 2434. 2000, World Bank: Washington DC.
23. Filmer, D. and L. Pritchett, The effect of household wealth on educational attainment: evidence from 35 countries. *Population and Development Review*, 1999. **25**(1): p. 85-120.
24. Bonilla -Chacin, M. and J. Hammer, *Life and death among the poorest*, Mimeo. 1999, The World Bank: Washington DC.
25. Stecklov, G., A. Bommier, and T. Boerma, *Trends in equity in child survival in developing countries: An illustrative analysis using Ugandan data*, Mimeo. 1999, Carolina Population Center.
26. Contoyannis, P. and P. Forster, The distribution of health: a theoretical framework. *Journal of Health Economics*, 1999. **18**: p. 605-622.
27. Vega, J., et al., *Chile 1985-1996: a multi-level study of education's impact on health equity*, Mimeo. 1999.
28. World\_Bank, *Confronting AIDS: Public Priorities in a Global Epidemic*. 1999, Oxford: Oxford University Press.
29. Baker, J. and J. van der Gaag, *Equity in health care and health care financing: Evidence from five developing countries*, in *Equity in the finance and delivery of health care: An international perspective*, E. van Doorslaer, A. Wagstaff, and F. Rutten, Editors. 1993, Oxford University Press: Oxford.
30. van Doorslaer, E., A. Wagstaff, and F. Rutten, eds. *Equity in the finance and delivery of health care: An international perspective*. 1993, OUP: Oxford.
31. Sen, B., *Health and poverty in the context of country development strategy: A case study on Bangladesh*. 1997, WHO: Geneva.
32. Humphries, K. and E. van Doorslaer, Income-related health inequality in Canada. *Social Science and Medicine*, 2000. **50**: p. 663-71.
33. Claeson, M., et al., *Health, Nutrition and Population*, in *Poverty Reduction Strategy Paper Sourcebook*., World\_Bank, Editor. 2000, The World Bank: Washington DC.  
<http://www.worldbank.org/poverty/health/library/srcebkm.htm>.

34. Mosley, W. and L. Chen, An analytical framework for the study of child survival in developing countries. *Population and Development Review*, 1984. **10**: p. 25-45.
35. Grossman, M., *The Demand for Health: A Theoretical and Empirical Investigation*. 1972, New York: NBER.
36. Cebu Study Team, Underlying and proximate determinants of child health: The Cebu longitudinal health and nutrition study. *American Journal of Epidemiology*, 1991. **133**(2): p. 185-201.
37. Schultz, T., Studying the impact of household economic and community variables on child mortality. *Population and Development Review*, 1984. **10**: p. 215-235.
38. Kawachi, I. and B.P. Kennedy, Health and social cohesion: why care about income inequality? *British Medical Journal*, 1997. **314**(7086): p. 1037-1040.
39. Kawachi, I., B.P. Kennedy, K. Lochner, and D. Prothrow-Stith, Social capital, income inequality and mortality. *American Journal of Public Health*, 1997. **87**(9): p. 1491-1498.
40. World Health Organization, *CHD 1996-97 report*. 1998, Geneva: World Health Organization.
41. Van Doorslaer, E. and A. Wagstaff, Equity in the delivery of health care: some international comparisons. *Journal of Health Economics*, 1992. **11**(4): p. 389-411.
42. Van Doorslaer, E., et al., Equity in the delivery of health care: further international comparisons. *Journal of Health Economics*, 2000.
43. Wagstaff, A., E. Van Doorslaer, and P. Paci, On the measurement of horizontal inequity in the delivery of health care. *Journal of Health Economics*, 1991. **10**(2): p. 169-205.
44. Wagstaff, A. and E. Van Doorslaer, Measuring and testing for inequity in the delivery of health care. *Journal of Human Resources*, 2000. **35**(4): p. xx-xx.
45. Filmer, D., J. Hammer, and L. Pritchett, *Health policy in poor countries: Weak links in the chain*. 1998, World Bank: Washington DC.
46. Yaqub, S., *How equitable is public spending on health and education? Background paper for WDR 2000/1*. 1999, World Bank: Washington DC.
47. Castro-Leal, F., J. Dayton, L. Demery, and K. Mehra, Public social spending in Africa: Do the poor benefit? *World Bank Research Observer*, 1999. **14**(1): p. 49-72.
48. Marmot, M. and J. Mustard, *Coronary heart disease from a population perspective*, in *Why Are Some People Healthy and Others Not?*, R. Evans, M. Barer, and T. Marmor, Editors. 1994, Aldine de Gruyter: New York.
49. North, F., et al., Explaining socioeconomic differences in sickness absence: the Whitehall II study. *British Medical Journal*, 1993. **306**(6874): p. 361-6.
50. Marmot, M., G. Rose, M. Shipley, and P. Hamilton, Employment grade and coronary heart disease in British civil servants. *Journal of Epidemiology and Community Health*, 1978. **32**: p. 244-49.
51. Glewwe, P., Why does mother's schooling raise child health in developing countries? *Journal of Human Resources*, 1999. **34**(1): p. 124-59.

52. Woolcock, M. and M. Narayan, Social capital: implications for development theory, research and policy. *World Bank Research Observer*, 2000. **15**(2).
53. Lavy, V., J. Strauss, D. Thomas, and P. de Vreyer, Quality of care, survival and health outcomes in Ghana. *Journal of Health Economics*, 1996. **15**(333-357).
54. Panis, C. and L. Lillard, Health inputs and child mortality. *Journal of Health Economics*, 1994. **13**: p. 455-89.
55. Rosenzweig, M. and K. Wolpin, Governmental interventions and household behavior in a developing country: Anticipating the unanticipated consequences of social programs. *Journal of Development Economics*, 1982. **10**: p. 209-25.
56. Benefo, K. and T. Schultz, Fertility and child mortality in Cote d'Ivoire and Ghana. *World Bank Economic Review*, 1996. **10**(1): p. 123-58.
57. Mwabu, G., M. Ainsworth, and A. Nyamete, Quality of medical care and choice of medical treatment in Kenya: An empirical analysis. *Journal of Human Resources*, 1993. **28**(4): p. 838-62.
58. Thomas, D., V. Lavy, and D. Strauss, Public policy and anthropometric outcomes in the Cote d'Ivoire. *Journal of Public Economics*, 1996. **61**: p. 155-192.
59. Wong, E., B. Popkin, D. Guilkey, and J. Akin, Accessibility, quality of care and prenatal care use in the Philippines. *Social Science and Medicine*, 1987. **24**(11): p. 927-44.
60. Alderman, H. and V. Lavy, Household responses to public health services: cost and quality tradeoffs. *World Bank Research Observer*, 1996. **11**(1): p. 3-22.
61. Gertler, P. and R. Sturm, Private health insurance and public expenditures in Jamaica. *Journal of Econometrics*, 1997. **77**(1): p. 237-258.
62. Schwartz, J., J. Akin, and B. Popkin, Price and income elasticities of demand for modern health care: the case of infant delivery in the Philippines. *World Bank Economic Review*, 1988. **2**(1): p. 49-76.
63. Akin, J. and P. Hutchinson, Health care facility choice and the phenomenon of bypassing. *Health Policy and Planning*, 1999. **14**(2): p. 135-51.
64. Barera, A., The role of maternal schooling and its interaction with public health programs in child health production. *Journal of Development Economics*, 1990. **32**: p. 69-91.
65. Wolfe, B. and J. Behrman, Determinants of child mortality, health and nutrition in a developing country. *Journal of Development Economics*, 1982. **11**: p. 163-93.
66. Hughes, G. and M. Dunleavy, *Why do babies and young children die in India ? The role of the household environment*, Mimeo. 2000, The World Bank: Washington DC.
67. Wagstaff, A., *Unpacking the causes of inequalities in child survival: the case of Cebu, The Philippines*, Mimeo. 2000, The World Bank: Washington DC.
68. Filmer, D., *The structure of social disparities in education*, Policy Research Working Paper. 2000, The World Bank: Washington DC.
69. Leighton, C. and F. Diop, *Protection for the poor under cost recovery*, Mimeo. 1999, Abt Associates: Bethesda, MD.

70. World Health Organization, *The World Health Report 2000: Health Systems*. 2000, Geneva: The World Health Organization.
71. Acheson, D., *Independent Inquiry into Inequalities in Health*. 1998, London: The Stationery Office.
72. Bidani, B. and M. Ravallion, Decomposing social indicators using distributional data. *Journal of Econometrics*, 1997. **77**: p. 125-139.







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ISBN 1-932126-26-0