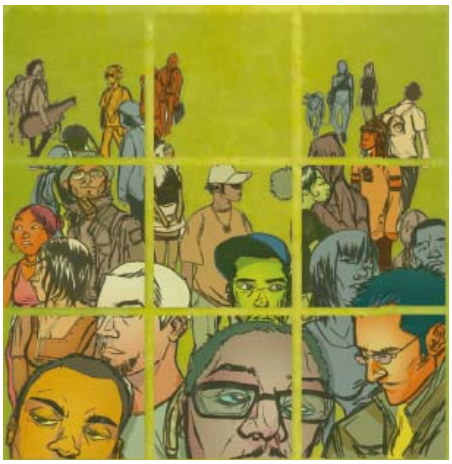
Risk pooling and redistribution in health care: an empirical analysis of attitudes toward solidarity

Chris James & William Savedoff

World Health Report (2010)
Background Paper, 5

HEALTH SYSTEMS FINANCING
The path to universal coverage

World Health Organization



Risk pooling and redistribution in health care: an empirical analysis of attitudes toward solidarity

World Health Report (2010) Background Paper, No 5

Chris James[1] and William D. Savedoff[2]

[1] World Health Organization, Western Pacific Regional Office, Manila, the Philippines
[2] Social Insight Portland, Maine, USA

1 Introduction

Policy makers across the world stress the importance of ensuring adequate health care for all. A significant barrier to this objective is the frequently high cost of health care relative to an individual's income, and that the need for such care is often uncertain. Thus health financing policies across the world promote risk pooling mechanisms to protect people from this barrier to health care, often with special attention given to the poor.

Yet the implication of such health financing mechanisms is that the healthy will end up paying for some or all of the health care services used by the sick. And, to the extent that the mechanism is progressive, it means the wealthier will be paying for services used by the poor. "Solidarity" is the term that is used to describe people's willingness to participate in these kinds of redistributive schemes.

The purpose of this paper is to provide a quantitative assessment of the scope of solidarity in different countries and to explore the potential determinants of solidarity along both dimensions: healthy and sick, non-poor and poor. First, the paper extracts a series of hypotheses about solidarity from a review of theories regarding people's willingness to participate in redistributive schemes. Second, the paper analyses questions regarding solidarity in a household survey that was conducted in 24 countries. By better understanding the determinants of people's commitment to solidarity, it should be possible to assess the acceptability of different risk pooling mechanisms, and thus better guide policies to improve access to health care.

2 Determinants of willingness to support redistribution to the sick and poor (when sick): theoretical insights

2.1 Fields of study

Different views of human beings give rise to different explanations of the willingness to redistribute to those in a worse condition. A broad range of theories, typically coming from the fields of economics, evolutionary biology and sociology, have explained the willingness to redistribute in terms of rational responses by individuals to the different situations they are, or may find themselves, in. These theories postulate that people are fundamentally driven by self-interest as opposed to pure altruism, even if this self-interest is often with regard to benefits that are not immediately apparent.

In contrast, other theories, emanating mainly from the field of psychology, focus more on differences between individuals in terms of empathy and notions of fairness. That is, such theories seek to explain why certain individuals are more altruistic than others, and this altruism can explain differences in willingness to redistribute to those in a worse condition.

From this wide-ranging, multidisciplinary literature, a number of hypotheses can be derived regarding who will be likely to support redistribution to the sick and to the poor (when sick). Indeed, while those coming from different disciplines may still disagree on the relative importance of self-interest (both immediate and expected) and pure altruistic behaviour in explaining willingness to redistribute, there seems to be a growing recognition that self-interest alone cannot explain this willingness to redistribute. For example, in recent years experimental economists have begun to challenge traditional economist's view of human beings by gathering abundant evidence demonstrating the importance of notions of fairness in redistributive decisions (Fehr, 2000; Charness and Rabin, 2002).

2.2 Who is most likely to support redistribution to the sick and/or poor (when sick)? Six hypotheses derived from the theoretical literature

Six distinct groups of hypotheses can be derived from the literature on altruistic behaviour. The first three hypotheses rely on a model of self-interested behaviour, either narrowly construed to incorporate only the immediate interests of the individual or more broadly construed to incorporate expectations of an individual's future prospects and attitudes toward risk. The fourth and fifth hypotheses are based on a model in which individuals have a direct interest in the welfare of others; while the last hypothesis emphasizes the impact of social interactions, experience, and relationships in fostering altruistic attitudes.

- *Hypothesis 1: Self-interested behaviour focused on the present.*

Much of the literature assumes that individuals are self-interested, that is, the welfare of others does not affect their own wellbeing (in economic terms, utilities are independent). A direct implication is that the willingness to contribute for the health care of the sick and poor is negatively related to current health status and wealth. In this view, people only approve of such redistribution if they will benefit from it themselves. A substantial empirical literature supports this theoretical position, particularly regarding people's attitudes toward redistribution of income (Mueller, 2003: chapter 3). This hypothesis can be rejected if solidarity is positively associated with an individual's wealth and health status.

- *Hypothesis 2: Self-interested behaviour considering the future.*

Uncertainty about falling sick and/or becoming poor in the future may motivate even the healthy and rich person to prefer some redistribution toward disadvantaged groups today, as a hedge against the risk of being in need of such transfers in the future. That is, individuals may approve of redistributive schemes if they are trying to maximize their own expected utilities under conditions of uncertainty. Willingness to contribute to the sick and poor is therefore dependent on *expected* as well as current health status and wealth. Again, the evidence regarding income redistribution is most apparent. For example, Alesina and La Ferrara (2001) show that in the US, the greater the probability of people becoming rich, the lower is their support for redistributive policies. Further, Diaz and Echevarria (2002) note that empirical evidence illustrates that transfers are more important sources of income for those with low incomes and in low-income countries and, therefore, more popular among these groups.

Determinants of expected health status include not only current health status, but also lifestyle (e.g. whether the individual smokes cigarettes), the natural environment (e.g. level of pollution), the socio-political environment (e.g. political stability) and biological factors (e.g. family medical history), and income. Determinants of expected wealth include, among others, education, work experience, health status and the general economic outlook, as well as current income. If current income and health status are negatively related to views on solidarity while predictors of future likelihood of needing care are positively related to views on solidarity, the findings would support this hypothesis.

- *Hypothesis 3: Self-interested behaviour influenced by aversion to risk.*

Under conditions of uncertainty, no-one knows if they will need costly healthcare in the future or if they will become poor. Thus, in addition to considering their future prospects as in hypothesis two, more risk-averse individuals are likely to be much more sensitive to potential future losses than those who are less risk-averse. Hence, more risk-averse individuals are likely to be more supportive of redistributive mechanisms as a hedge against such adverse events. Alesina and La Ferrara (2001) find some evidence for this in the US. It is also interesting to note that if one were to follow Rawls' theoretical analysis of decision-making *behind a veil of ignorance*, such a risk-averse nature would lead one to prefer redistribution to the sickest and the poorest.

The impact of risk aversion on expressions of solidarity will be offset to the extent that individuals are already protected against future losses. For example, individuals with health insurance will be less concerned about financial losses associated with future illness, and under this hypothesis would therefore be less likely to express support for solidarity. While the survey

data does not include variables that would permit us to test the extent to which risk-aversion affects expressions of solidarity, it will be possible to test whether individuals with health insurance are less supportive of paying for health care needs of the sick and the poor.

- *Hypothesis 4: Individuals are altruistic but respond to the cost of giving.*

Some theories argue that an individual's own welfare is directly affected by the welfare of others (i.e. utilities are interdependent). In this case, people will give more when the intrinsic benefits they derive from giving to improve other people's welfare exceeds the cost of that gift. Becker (1976) explored this hypothesis in his analysis of the household, showing that wealthier individuals are more willing to give to others when compared to poorer individuals because their cost of giving is, relatively speaking, lower. Thus wealthier individuals are predicted to give more towards the sick and poor (when sick), everything else being equal. Interestingly, this mechanism contrasts with the first hypothesis, the difference being that Becker's framework of analysis addresses the benefits from giving (whether this is a psychic or reciprocal benefit). Finding that wealth is positively related to solidarity would be supportive of this hypothesis and distinguish between the model of self-interested behaviour (hypothesis one) and this model.

- *Hypothesis 5: Attitudes toward solidarity are influenced by interest in preserving one's genes.*

Evolutionary biologists argue that one is most concerned with the welfare of those who have the greatest impact on your or your gene's survival. In evolutionary biology, this fundamental concept is described as "inclusive fitness" (Hamilton, 1964). The concept suggests favouring first those who share your genes. This is known as "kin selection", and has been used to explain many observed altruistic behaviours among primates (see, for instance, McAndrew, 2002, for a further discussion of evolutionary biology explanations of altruistic behaviour).

These arguments are sometimes extended to incorporate apparently altruistic behaviour toward individuals who are not genetically close if these other people affect the survival of you and/or those genetically close to you. Evolutionary biologists thus argue that individuals are willing to help – and thus support redistribution to – the wider group of people that one interacts with, assuming that they in turn may well help you in the future. This is known as "reciprocal altruism", and is well supported by evidence on bargaining behaviour (Fehr, 2000). Although the survey contains variables to identify individuals who have close relatives from those who don't, it is difficult to distinguish this hypothesis from the next hypothesis, given the available data, as discussed further below.

- Hypothesis 6: Attitudes toward solidarity are affected by social interactions and empathetic notions

Sociologists and anthropologists reach similar conclusions about the importance of interactions from a different viewpoint, one that stresses the role of gift-giving in developing and cementing social relationships. Hence, the willingness to give contributions to the sick and poor (when sick) may depend upon the kinds and strength of social relationships in which people are engaged. Empirical analyses of gift-giving highlight that gifts are given and received mostly from those social groups one interacts with the most (Komter, 2001: 392-394).

Furthermore, when people have interactions with one another, they develop social and psychological relationships. Thus, as a result of experiencing interactions with the sick or the poor, individuals may have a variety of reactions that motivate support for redistribution. That is, people who spend time with sick and poor people may better empathise with them. Indeed, it has long been observed that empathy is closely related to past experience and familiarity by a number of psychologists and, further, to be an important explanation of observed altruistic behaviour (Eisenberg and Miller, 1987; Hoffman, 1986; Preston and de Waal, 2002).

Empathy for the sick and poor is not just dependent on direct interaction with these groups, but also on other aspects of learning that help form an individual's ethical notions. This is often referred to as "social learning", and is seen by psychologists as an important observed predictor of altruistic behaviours: as people develop, so too do their notions of morality, which counteract to some extent more self-interested behaviours. Indeed, Armitage and Conners (2001) note the importance of moral norms in an analysis of the determinants of blood donation. Such learning might be developed through education, leading those with more years of schooling to be more supportive of redistribution to the sick and poor (when sick), everything else being equal (Rushton, 1982).

Following this logic further, one would expect those individuals who have experienced responsibility for others to be more likely to support redistribution to the sick and poor (when sick), as they have "learnt" the ethical notion of being responsible for those who cannot fully look after themselves. Such individuals include, among others, parents (and mothers in particular) and elder siblings in orphaned families. Indeed, Selten and Ockenfels (1998) find a significant empirical gender effect in both their work and others' previous work; and Monroe (1994) adds that in general, anthropological studies point to the importance of family position.

2.3. Intervening factors: beliefs

Whilst our analysis focuses on distinguishing which characteristics are associated with greater support for redistributive programs, it is important to note that individuals responding to a question regarding solidarity will also be influenced by their beliefs regarding the effectiveness of policies and the causes of ill health and poverty.

First, people may be more supportive of redistributive policies when they have confidence in the institutions that would be responsible for implementation. Even if individuals preferred a high level of redistribution to the sick and poor (when sick) in principle, they may still be unwilling to support such a policy if they do not trust the institution to be an effective implementer of this redistribution. This would be the case, for instance, if a government that is widely perceived as being corrupt would be the institution responsible for such redistribution.

Secondly, beliefs about why people become ill or poor will also affect people's responses to questions about solidarity. In particular, people may be more supportive of redistribution if they believe that recipients were not responsible for their own misfortune, that is, their need for support is due to exogenous factors beyond the recipients' control (Alesina and La Ferrara, 2001; Alesina and Angeletos, 2005). By contrast, if people believe that ill health and poverty are the individual's own fault, they may be much less supportive of redistribution.

To the extent that these beliefs are shared identically across individuals, they will not bias the estimated coefficients. However, if such beliefs vary systematically across countries, it would affect the cross-country comparisons. It is not possible with the available data to control for such beliefs.

2.4 Hypotheses and links to empirical testing

The existing literature for explaining attitudes toward redistributive programs is extensive and spans many disciplines. Table 1 summarizes the main hypotheses that have been derived from the literature, along with corresponding proxy variables from the World Health Survey.

Table 1: Who is most likely to support redistribution to the sick and/or to the poor (when sick)? Hypotheses and proxy variables

Type of redistribution	Individuals who are most likely to support redistribution to the sick and/or poor (when sick)	Proxy variables & expected sign of coefficient	
Hypothesis 1: Self-interested behaviour focused on the present			
Healthy→ Sick	Individuals who are currently sick	In ill-health (self-perception)	+
All→ Poor	Individuals who are currently poor	Income quintile	-
Hypothesis 2: Self-interested behaviour considering the future			
Healthy→ Sick	Individuals most likely to become sick	In ill-health (self-perception)	+
		Recent healthcare utilisation	+
		Income quintile	-
All→ Poor	Individuals most likely to become poor	*Same as healthy→ sick, but not recent healthcare utilisation*	
Hypothesis 3: Self-interested behaviour influenced by aversion to risk			
Both types of redistribution	Individuals with higher risk aversion	N/A	
	Individuals who have no protection against future losses	Covered by health insurance	-
Hypothesis 4: Individuals are altruistic but respond to the cost of giving			
Both types of redistribution	Individuals for whom the cost of giving is lower	Income quintile	+
Hypothesis 5: Attitudes towards solidarity are influenced by interest in preserving one's own genes			
Healthy→ Sick	Individuals who are related / interact with the sick	Sick household member	+
		Health worker (or trained)	+
All→ Poor	Individuals who are related / interact with the poor	Income quintile	-
Hypothesis 6: Attitudes towards solidarity are affected by social interactions and empathetic notions			
Healthy→ Sick	Individuals who interact with the sick	Sick household member	+
		Health worker (or trained)	+
All→ Poor	Individuals who interact with the poor	Income quintile	-
Both types of redistribution	Individuals with greater "social learning"	Education level	+
		Head of household	+
Intervening factors: beliefs [NOT TESTED]			
Both types of redistribution	Individuals who have more trust in the redistributing institution		
	Individuals who view recipient's sickness / poverty as misfortune rather than their own fault		

Data limitations, though, mean that some of the proxy variables are not sufficiently specific to distinguish between the six identified hypotheses. For instance, while a positive coefficient for the variable that a respondent perceives herself to be in ill-health is precise enough to indicate self-interested behaviour, it is not clear if such a result supports one or both of hypotheses 1 and 2.

Other variables have more severe identification problems. For example, if having a sick relative were positively associated with support for redistribution, it would not be possible to distinguish whether this association is a consequence of improving the chances of genetic survival (hypothesis 5), of empathy due to living in proximity with the ill person, or of social relationships with those individuals (hypothesis 6). Even testing whether those with lower income are more likely to support redistributive policies has these problems of identification. These people are more likely to be or become sick and/or poor (hypotheses 1 and 2). On the other hand, they may

better empathise with the sick and/or poor as they have greater experience of these groups' suffering (hypothesis 6).

Furthermore, social learning (as measured by years of schooling) could be positively or negatively associated with solidaristic behaviours depending on the content of that schooling. It is also likely to be correlated with wealth - which has been identified as a separate factor above. Finally, it is not possible with this data to distinguish whether individuals who are active in taking care of sick and poor people develop notions of solidarity as a result of their experiences, or whether they choose to be engaged in such interactions as a result of some prior factor.

3 General empirical strategy[3]

This study analyzes people's opinions on paying for healthcare for sick individuals by applying ordinal logit techniques to survey questions. In particular, we begin by defining a latent variable, Y^*_{ic}, that denotes the willingness of individual *i* living in country *c* to support such redistribution. In particular:

$$Y^*_{ic} = X_{ic}\,\beta_1 + C\,\beta_2 + \varepsilon_{ic} \qquad (1)$$

where X_{ic} is a vector of individual characteristics; C is a vector of country dummies; and ε_{ic} is a vector of residuals. The β_1 and β_2 vectors are parameters.

We do not observe Y^*_{ic} but rather a variable taking values 1 to 5 increasing in an individual's support for redistribution to the sick or to the poor when sick. In particular, we have:

$$\begin{aligned} Y^*_{ic} &= 1 \quad \text{if } Y^*_{ic} \le \gamma_1 \\ Y^*_{ic} &= 2 \quad \text{if } \gamma_1 < Y^*_{ic} \le \gamma_2 \\ &\ldots \\ Y^*_{ic} &= 5 \quad \text{if } \gamma_4 < Y^*_{ic} \le \gamma_5 \end{aligned} \qquad (2)$$

Where $\gamma_1, \ldots, \gamma_5$ are unknown parameters to be estimated with the β parameters. This equation can then be estimated as an ordered logit regression, assuming that the distribution of the error term is logistic. The β parameters on the country dummies will tell us the average willingness to support redistribution in a given country relative to an omitted country, and allow us to test whether there are significant differences across countries. The parameters on the individual

[3] Our methodology closely follows that adapted by Alesina and La Ferrara (2001).

characteristics, such as wealth, health status, or education, will allow us to test the hypotheses regarding determinants of opinions regarding solidarity.

4 The Data

4.1 Survey methods

In recent years, WHO promoted the use of a World Health Survey (WHS) that would provide more general information on population health status, income, and attitudes than is available in most other surveys. The WHS was conducted in 71 countries in 2002-2003. The basic survey questionnaire was the same for all countries; however, modifications were introduced to address differences between low and high income countries, to create a short and long option, and to incorporate specific preferences and institutional differences between countries. As one example, the two questions on solidarity that are used in this study were only administered in a handful of countries – the rest opted not to include the questions.

Of the 30 countries that included the solidarity questions, 24 had sufficiently large numbers of respondents to provide the basis for a meaningful analysis. Those countries are: Bangladesh, Burkina Faso, the Comoros, the Congo, Croatia, Ethiopia, Georgia, Ghana, India, Kenya, the Lao People's Democratic Republic, Malawi, Malaysia, Mauritania, Myanmar, Namibia, Pakistan, the Philippines, Slovakia, South Africa, Swaziland, Viet Nam, Zambia and Zimbabwe. These countries provide a range of cultural contexts across Asia, Africa and Eastern Europe, and a range of income levels from approximately US$100 per capita in Ethiopia to US$3950 per capita in Slovakia (2002 figures).

In each case, a local university, research institution or government agency had primary responsibility for designing and conducting the survey. Each institution proposed sampling methods designed to randomly select households in a way that would be nationally representative. The sample sizes varied from 993 in Croatia to 10,273 in India. At each household, a series of questions about the household were asked of an informant, after which an individual older than 18 years of age would be randomly selected from the household members to respond to the main section of the questionnaire, addressing questions of health, health service utilization, and attitudes. Thus, unlike many other household health surveys, the WHS allows us to analyse a nationally representative group of adults.

4.2 Variables, Questions and Summary Statistics

The main variables used in this analysis are the respondent's answers to two specific questions regarding attitudes toward solidarity, along with characteristics of the respondent (e.g. education, sex) and the respondent's household (e.g. income, health status of household members). Respondents were asked two questions regarding their attitudes toward solidarity. The first question was:

> *How much do you think healthy people in [the country] should contribute to pay for the health care used by sick people?*

to which the person could select one of five options:

1. None of the cost
2. Some of the cost
3. Half of the cost
4. Most of the cost
5. All of the cost

Thus, the answers were ordinal, but due to the nature of the options, they have some degree of cardinality – the first, third, and fifth options have clear cardinal interpretations, while the second and fourth are bounded.

The second question was:

> *How much do you think people in [the country] should contribute to pay for the health care used by poor people when they become sick?*

The respondent could select from the same five ordinal options, ranging from "none of the cost" to "all of the cost". The answers to these two questions are the dependent variables in the following analysis.

Based on the literature review and hypotheses identified above, a series of correlates and explanatory variables were selected from the survey questions. These are summarized in the table below.

Table 2: Summary of sample characteristics and variables

	Ill-health (% "bad" or "very bad")	Recent health care utilisation (%)	Educ. level (median)	Covered by health ins. (%)	Sick household member (%)	Health worker or trained (%)	Household head (%)	Female (%)	Age (median)
Bangladesh	17.5%	63.9%	2	0.0%	39.1%	3.1%	43.3%	52.4%	35
Burkina Faso	6.7%	44.9%	1	0.5%	36.9%	1.4%	48.6%	52.5%	32
Comoros	16.6%	51.5%	1	2.6%	29.0%	1.3%	41.1%	55.5%	40
Congo	12.9%	29.6%	3	14.8%	23.7%	3.3%	38.8%	50.3%	33
Croatia	17.7%	85.9%	4	96.1%	13.9%	5.0%	72.2%	59.2%	52
Ethiopia	5.4%	35.2%	2	0.1%	24.6%	0.6%	56.0%	51.3%	34
Georgia	21.9%	45.5%	5	94.5%	15.5%	7.0%	56.1%	56.0%	48
Ghana	7.1%	51.1%	2	2.3%	29.9%	1.7%	52.8%	54.2%	38
India	15.3%	64.4%	3	2.8%	24.0%	1.4%	47.0%	50.4%	35
Kenya	7.9%	57.2%	3	11.1%	35.4%	1.5%	65.5%	56.5%	34
Lao PDR	3.8%	22.6%	3	0.2%	20.5%	1.8%	48.1%	52.6%	36
Malawi	5.0%	61.9%	2	0.6%	35.7%	1.5%	64.2%	57.3%	30
Malaysia	3.6%	60.2%	4	37.8%	23.5%	3.5%	60.2%	55.5%	39
Mauritania	4.3%	44.8%	1	1.2%	16.3%	5.0%	49.4%	60.4%	35
Myanmar	2.7%	34.2%	3	0.03%	16.7%	0.9%	53.5%	56.3%	39
Namibia	6.2%	45.4%	3	13.3%	18.7%	2.4%	55.9%	58.4%	33
Pakistan	4.5%	54.1%	1	0.3%	36.1%	1.3%	44.8%	44.1%	35
Philippines	3.7%	33.0%	4	17.4%	28.4%	1.9%	59.2%	53.8%	36
Slovakia	5.8%	63.5%	5	70.5%	11.1%	6.4%	94.7%	61.1%	38
South Africa	7.3%	40.1%	4	16.4%	20.6%	6.5%	54.8%	51.7%	35
Swaziland	44.1%	17.8%	3	0.2%	10.9%	24.8%	37.2%	51.6%	35
Viet Nam	6.6%	47.6%	4	20.3%	32.9%	3.6%	56.4%	54.4%	38
Zambia	7.1%	61.4%	3	3.1%	36.1%	1.2%	55.3%	53.7%	32
Zimbabwe	11.3%	56.7%	3	4.1%	29.7%	2.3%	68.7%	62.0%	33

Notes: "Ill-health" refers to percentage of individuals that responded "bad" or "very bad" when asked about their health status. "Recent health care utilization" refers to percentage of households with an individual who used outpatient care in previous 3 months or inpatient care in previous five years. "Education Level" is scored 1 for individuals with no formal schooling; 2 (some primary schooling); 3 (completed primary); 4 (some secondary); and 5 (high school or equivalent completed). "Covered by health insurance," "Sick household member" and "health worker or trained" refer to the share of households with someone reporting affiliation with a health insurance plan, reportedly sick, or with health worker training respectively.

Most of the variables are self-explanatory, such as sex and level of schooling. The question regarding ill-health is a response to the question "in general, how would you rate your health today?" to which the respondent can give one of five answers ranging from "very good" to "very bad". A dummy variable for those self-reporting either "bad" or "very bad" health was used in our analysis. Questions regarding the utilization of health services refer to the last 30 days in all cases except for hospitalization, which refers to the last five years. A variety of income measures were investigated, using questions about assets, household expenditure, and household health spending. The various measures are positively correlated and are also positively associated with age and education, thus giving us some confidence in their reliability.

In all of the samples, women slightly outnumbered men. Average schooling was lowest in the Burkina Faso, the Comoros and Mauritania samples – "no formal schooling" was the median. The highest education levels were found in the Georgian and Slovakian samples – registering a

median score of "high school (or equivalent) completed". In general, education averages seem slightly high compared to census results and household survey data. In combination with the relatively high indicators of wealth (e.g. household income, owning a television, and health expenditures), it appears likely that the samples more representative of a more educated and wealthier selection of individuals than would a truly nationally representative sample. Further, health status perceptions varied considerably across countries, being especially pessimistic in Swaziland and Georgia, and health insurance membership seemed unrealistically high in a number of countries, perhaps reflecting different interpretations/translations of "health insurance". Swaziland's sample also seemed to contain a disproportionately high number of health workers. It was not possible to investigate these potential biases in further detail, and they should be kept in mind when trying to generalize the findings beyond the sample concerned.

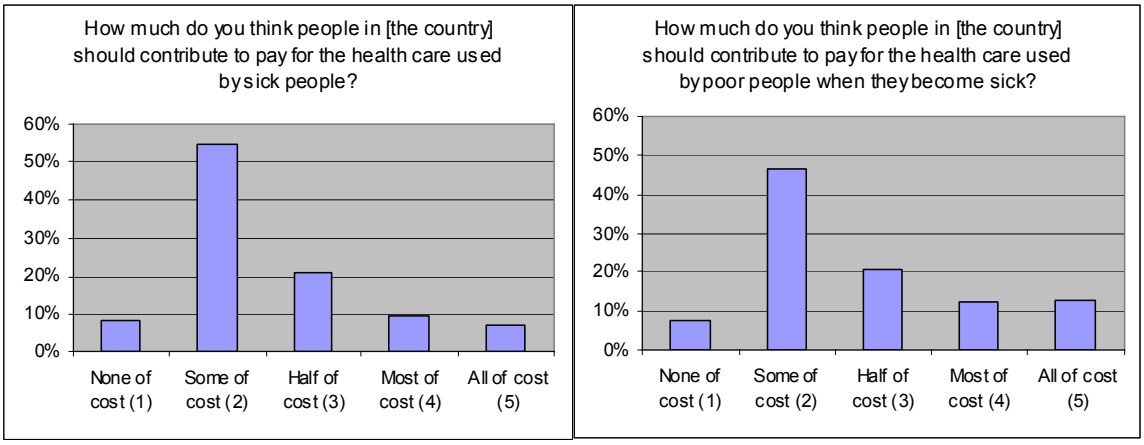
The sample size for analysis was reduced by the number of observations that had missing answers, particularly for the dependent variables. This generally didn't represent a large proportion of the sample, although in Georgia and Mauritania the figures were very high: around 50% of their samples. Therefore, the potential bias in non-responses must also be considered when interpreting results, especially in these two countries.

5 Empirical results from the World Health Survey

5.1 Distribution of Attitudes toward Solidarity

Combining the responses to this question across all 24 countries, one finds that the dominant attitude is the same for both redistribution from healthy people to the sick and all people in the country to the poor: they should contribute "some of the cost" for the health care used by these disadvantaged groups. This is illustrated in figure 1 below:

Figure 1: Views on redistribution (pooled sample of across 24 countries)



Perhaps the most striking result of the survey analysis, though, is the similarities in responses to questions of solidarity across such a wide range of countries (see table 3 and figure 2 below). Looking first at the question regarding how much healthy people should contribute to pay for health care used by sick people (hereafter referred to as "solidarity with the sick"); the mode of the response was "some of the cost" in twenty three of the twenty-four countries. In eleven of these countries, this answer was chosen by more than 60% of the respondents. Fewer than 20% of the respondents answered that none of the costs should be covered by the healthy in all countries. On the other hand, less than 20% of the respondents thought that the health care of the sick should be paid completely by the healthy in all countries.

The average response to questions about solidarity with the sick ranged from 2.1 in Georgia to 3.1 in Ghana and Kenya. This demonstrates substantial support for some form of risk sharing with sick people. However, it also suggests that people generally expect the sick to pay a significant share of the costs of health services that they use. Although the differences between countries are statistically significant, they are nonetheless surprisingly small. One of way of seeing this is through an analysis of variance (see the annex for details). Grouping respondents by country explains some of the variance in responses, but only 7.7%. The remaining 92.3% of variance in responses is due to factors that vary within countries.

Similar results can be seen for the question regarding how much countries should pay to cover the cost of healthcare used by poor people when they become sick (hereafter referred to as "solidarity with the poor"), with the mode response typically being "some of the cost". However, in all but three of the countries, respondents showed greater solidarity with the poor than with the sick, based on comparison of average responses. And the share of respondents saying that the country should pay for "all of the costs", was higher - also in 21 of the 24 countries.

The average response on solidarity with the poor (when sick) ranged from 2.1 in Georgia to almost 3.5 in Kenya. This demonstrates substantial support for pooling the costs of healthcare to preferentially assist the poor when they fall ill. On average, people appear willing to cover closer to one-half of the costs of healthcare for the poor. But as in the previous case, there is substantial sentiment that even the poor should pay for an important share of their healthcare services. Again, the differences between countries are statistically significant; however, they are small relative to other factors (see annex for details). Grouping respondents by country accounts for 9.3 % of the total variance, with the remaining 90.7% of variance in responses explained by factors that vary within rather than between countries.

Figure 2: Views on redistribution (comparison between countries)

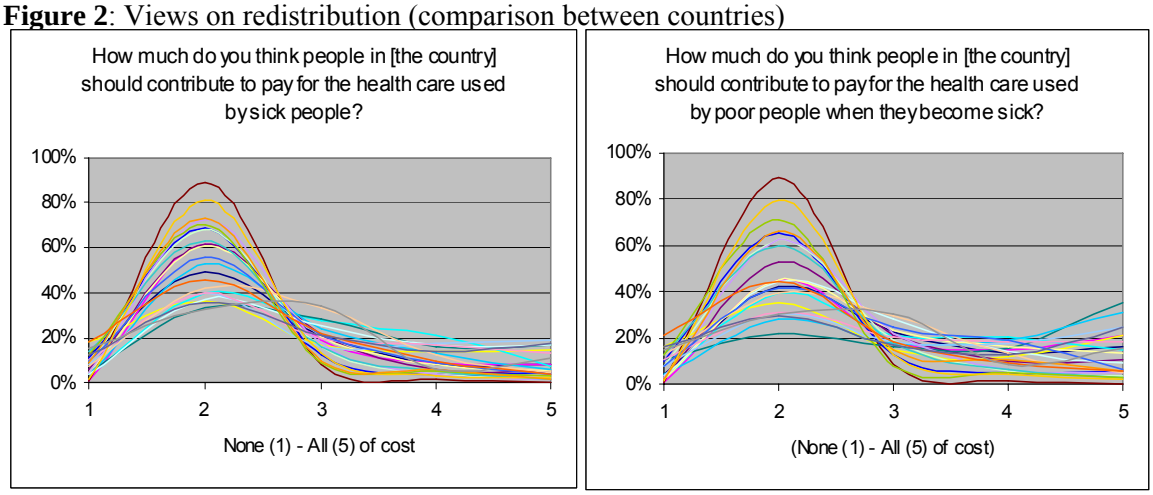


Table 3: Views on redistribution, comparison between countries (% of respondents)

	Healthy to sick					All to poor when sick				
	None (1)	Some (2)	Half (3)	Most (4)	All (5)	None (1)	Some (2)	Half (3)	Most (4)	All (5)
Bangladesh	1	62	19	9	9	1	45	19	15	21
Burkina Faso	12	50	21	8	8	5	42	23	14	17
Comoros	4	39	28	21	8	3	39	22	21	15
Congo	19	37	17	14	14	16	35	15	12	22
Croatia	11	69	12	4	5	11	65	13	5	6
Ethiopia	6	61	21	6	5	4	53	22	11	11
Georgia	1	90	8	1	0	1	89	9	1	0
Ghana	4	34	29	16	17	11	22	16	15	35
India	4	53	24	13	6	4	44	28	14	10
Kenya	4	37	25	17	17	4	28	18	19	31
Lao PDR	10	68	16	4	3	8	63	19	6	4
Malawi	11	39	20	17	13	11	31	21	19	18
Malaysia	5	73	17	3	2	3	63	22	7	5
Mauritania	9	39	16	18	19	8	30	19	18	25
Myanmar	4	61	21	9	5	2	45	23	16	13
Namibia	7	42	33	13	5	13	40	30	13	5
Pakistan	10	56	21	9	4	8	42	24	19	7
Philippines	14	63	16	5	2	13	60	17	7	3
Slovakia	12	70	9	6	3	13	71	8	5	3
South Africa	18	46	22	10	4	22	45	18	9	6
Swaziland	1	81	13	3	2	1	79	13	5	2
Viet Nam	9	73	10	6	1	2	66	15	11	6
Zambia	12	36	21	14	18	17	29	17	13	24
Zimbabwe	15	33	34	6	11	15	30	30	9	15
Total	**8**	**55**	**21**	**10**	**7**	**8**	**47**	**21**	**12**	**12**

As noted in the earlier discussion, there are numerous hypotheses regarding those factors that influence responses to questions about solidarity. The following statistical analyses will specifically test the impact of health status, expected health status, wealth and expected wealth (hypotheses one, two and four) on these opinions, while also presenting variables related to hypotheses five and six.

5.2 Regression results

We applied an ordinal logit analysis to the data, using the questions on solidarity as ordinal discrete dependent variables (see Tables 4 and 5 below). Beginning with the analysis of solidarity

with the sick, a pooled regression including all twenty-four countries had 96,333 observations. In this pooled analysis, being in poor health, head of household and having a lower education level were all significantly associated with a greater degree of solidarity with the sick (at the 5% significance level). Recent health care utilization was also positively associated with solidarity with the sick (at the 10% significance level). Variables related to household income, health insurance coverage, having worked or trained in the health field and gender did not have statistically significant effects on the expressions of solidarity.

The pooled regression would be justifiable if there were not significant differences across countries. However, the statistical significance of the majority of country dummies (as compared with Slovakia, the richest country in the sample) indicates that the effects of individual variables do appear to vary significantly across countries. Interestingly, all had positive coefficients, suggesting that poorer countries show greater solidarity with the sick.[4]

Table 4: Pooled regression results (ordered logit) on preferences for redistribution

	Redistribution from healthy to the sick			Redistribution from all to poor when sick		
Variable	**Coeff.**	**S.E.**	**P>|z|**	**Coeff.**	**S.E.**	**P>|z|**
In ill-health	0.115	0.024	0.000	0.174	0.023	0.000
Recent health care utilisation	0.023	0.014	0.091	NA	NA	NA
Income quintile 2	-0.016	0.020	0.416	0.012	0.019	0.535
Income quintile 3	-0.013	0.020	0.515	0.030	0.019	0.122
Income quintile 4	0.008	0.020	0.702	0.020	0.019	0.307
Income quintile 5	-0.008	0.021	0.698	0.006	0.020	0.753
Education level	-0.036	0.005	0.000	-0.027	0.005	0.000
Covered by health insurance	-0.042	0.026	0.106	0.021	0.025	0.394
Sick household member	0.022	0.015	0.135	NA	NA	NA
Health worker (or trained)	0.002	0.040	0.969	NA	NA	NA
Head of household	0.039	0.013	0.002	0.034	0.012	0.006
Female	-0.001	0.013	0.926	-0.004	0.012	0.767
Age 30-40	-0.026	0.017	0.122	-0.032	0.016	0.047
Age 40-50	-0.056	0.019	0.002	-0.053	0.018	0.003
Age 50-60	-0.124	0.022	0.000	-0.069	0.021	0.001
Age 60+	-0.069	0.022	0.002	-0.065	0.021	0.003
			N = 96333			N = 96308
			LR $\chi2$ = 7208			LR $\chi2$ = 8565
			Prob > $\chi2$ = 0.000			Prob > $\chi2$ = 0.000

Note: Country dummy variables were included in the pooled regression, but not reported for reasons of space. 20 out of 24 of these had significantly positive coefficients as compared with the excluded country (Slovakia, the richest country in the sample) for the regression on redistribution from the healthy to the sick. All 24 country dummy coefficients were significantly positive as compared with the excluded dummy for the regression on redistribution from all to the poor when sick.

The regression analysis was then conducted separately for each country, using the same variables whenever possible. After removing observations with missing variables, Croatia was again the

[4] It should be noted, however, that the richer countries in this sample are all from Eastern Europe and Central Asia, countries which emerged from repressive communist regimes only a decade before. Thus, the finding that poorer countries are characterized by somewhat higher levels of solidarity may be due to the specific historical circumstances of the post-communist transitions rather than to national income levels.

smallest sample, with 987 individuals, while the Philippines was the largest sample, with 9,962 individuals. The results suggest that the factors that distinguish respondents in terms of their support for solidarity with the sick are quite different in each country. The only variable that shows a statistically significant and consistent sign across two or more countries was whether someone was in ill-health. Being in ill-health was associated with responses that indicated greater solidarity with the sick. Being covered by health insurance, when significant, was associated with less solidarity with the sick in four out of six countries. Conversely, being head of household was associated with greater solidarity with the sick in eight out of ten countries.

Income levels had starkly differing effects across countries, although they generally had consistent effects within any one country. Thus within Burkina Faso, the Comoros, Georgia, Lao People's Democratic Republic, Malawi and Mauritania, higher income was associated with greater solidarity with the sick (although not all quintiles were significant). The opposite was true in the Congo, Croatia, Kenya, Malaysia, Namibia, the Philippines, Swaziland, Viet Nam and Zambia. Education, recent health care utilization, having a sick household member and the respondent's gender also had inconsistent effects.

With regard to solidarity with the poor, the overall findings are similar. In the pooled regression, all the country dummy variables had positive and significant coefficients, in comparison with Slovakia, the richest country in the sample. In other words, respondents in the poorer countries tended to express greater solidarity on average than those in the richest one. However, as indicated earlier, the differences were not large. Those in ill health, heads of households and those with lower education levels showed a significant greater degree of solidarity with the poor, as did middle-income individuals as compared with those in the lowest quintile, with other variables being statistically insignificant.

As before, the patterns in individual countries were quite different, and often inconsistent. The only variable to have a consistent effect across countries was respondents' own health status. Heads of household were also more likely to have greater solidarity with the poor in eight out of eleven countries (being insignificant in other countries). Again, income and education effects varied greatly across countries, although both more often showed positive relationships for having solidarity with the poor in particular as compared with the sick in general. Health insurance coverage and gender were rarely statistically significant.

Table 5a: Country-specific regression results on preferences for redistribution - from the healthy to the sick

Country	Ill-health	Recent utilisation	Income quintile 2	Income quintile 3	Income quintile 4	Income quintile 5	Education level	Covered by health ins.	Sick h'hold member	Health worker (or trained)	Household head	Female	Age: 30-39	Age: 40-49	Age: 50-59	Age: 60+
Bangladesh							---	NA	+			-		--		
Burkina Faso	+++			+++	+++	+++	+++	---								
Comoros				+	+++	++		+++				--				
Congo		++	---	---	--									--	--	
Croatia		--		--												
Ethiopia	+++	+++			+				+++		++					
Georgia	+++								---							
Ghana	+++						---								--	
India		++	+++				---									
Kenya	+					---	---		+			-				
Lao PDR		++	---	---	-		+++				+++	+++		---		
Malawi	+	++	++	+++	+++	+++	---		+++						-	
Malaysia		---		--	---	---		++			+++		---	---	---	---
Mauritania			++			++		---			+	+				
Myanmar							---									---
Namibia		--			--	---	--		--							
Pakistan	++						-				+++	+++			---	--
Philippines		---			---	--	+		--		--					
Slovakia							+++					---				
South Africa	+++	-					---	---				+++	-	--	-	--
Swaziland		+++				--		---	+++		+++		+	+		
Viet Nam				---	---	---			++	+	--	-		+		
Zambia		+	---	--			---				+					
Zimbabwe											+++		--	---		
Positive	8	7	3	3	4	4	4	2	6	1	8	4	1	2	0	0
Negative	0	5	3	6	6	6	10	4	3	0	2	5	3	6	6	4
Insignificant	16	12	18	15	14	14	10	17	15	23	14	15	20	16	18	20

Note: Three, two and one pluses / minuses denote significance at the 1%, 5% and 10% level respectively.

Table 5b: Country-specific regression results on preferences for redistribution - from all to the poor when sick

Country	Ill-health	Income quintile 2	Income quintile 3	Income quintile 4	Income quintile 5	Education level	Covered by health ins.	Household head	Female	Age: 30-39	Age: 40-49	Age: 50-59	Age: 60+
Bangladesh						--	NA						
Burkina Faso	++	---				+++		-					--
Comoros						+++	+++						
Congo		---	-				-						
Croatia	+++		-			++							
Ethiopia	+++		+++	+++	+++			+					
Georgia	+++												
Ghana	+++					---				--	-	--	
India		+		++	++	---							
Kenya	+++			--	---	--							
Lao PDR	+		--			+++		+++	++		-		
Malawi	+++	++	+++	+++		---		+++	-			--	--
Malaysia							+++	+++		---	---	---	---
Mauritania						+	---	+++					
Myanmar				++	+++	-							-
Namibia						---		-					
Pakistan	+++	++	+++	+++	+++	---		+++	+++	--	---	---	---
Philippines			--	---	--	+		---					
Slovakia						+++							
South Africa	+++					---				--	---	-	--
Swaziland							---	++	-				
Viet Nam	++				-	+++				+++	++	+	+++
Zambia	+++	---				---							++
Zimbabwe		-						+++		---	---		-
Positive	12	3	3	5	4	8	2	8	2	1	1	1	2
Negative	0	4	4	2	3	10	3	3	2	5	6	5	7
Insignificant	12	17	17	17	17	6	18	13	20	18	17	18	15

Note: Three, two and one pluses / minuses denote significance at the 1%, 5% and 10% level respectively.

6 Discussion

In general, across a wide spectrum of countries, solidarity with the sick and the poor appears to be quite similar in the aggregate. That is, a substantial part of the samples in these twenty-four countries - with more than 75% of respondents in any one country (and 92.9% of the samples combined) - favour some degree of help to the sick and the poor for health care costs. At the same time, a substantial share of the population believes that only some of the costs should be subsidized, with more than 75% of respondents in any one country (and 87.5% of the samples combined) favouring all or partial payment for healthcare by the sick and the poor themselves, apart from in Ghana and Kenya (where 35% and 31% of respondents believed that everyone should pay for poor people's health care).

When the samples are pooled, there appears to be some support for the hypotheses that people's responses to the questions of solidarity with the sick and with the poor are influenced by self-interest (hypotheses one and two). Those in ill-health and with lower education levels tended to express greater solidarity with the sick and the poor. However, the insignificant coefficient for income qualifies this to some extent.

Further, when the analysis is done separately for each country, the results present significant variation between countries. For example, in six out of twenty-four countries wealthier people tended to express greater solidarity with the sick, and for eight countries with the poor; whereas in ten countries the opposite held true for solidarity with the sick and in five countries for solidarity with the poor. Some researchers have argued that cross-country differences in support for redistribution may reflect variation in countries' welfare regimes (see, for example, Jaeger, 2009), although the evidence on this is mixed (Arts and Gelissen 2001, and Svallfors 1997). Moreover, our research shows no evident categorization of countries where redistribution was more or less favoured (in general or by specific population groups). The one consistent result was that those who are the most pessimistic about their own health status expressed a greater interest in having healthcare costs subsidized for both the sick in general and the poor in particular.

The WHS questions did not specify *how* healthcare costs would be subsidized, and the results might have been biased or confused by whether or not respondents trusted the institutions that would be likely to manage such subsidies (e.g. government). We explored this possibility by including the answers to a number of questions related to trust in government and fear of crime, but none played a consistent or strong explanatory role.

For those who are interested in establishing subsidies to healthcare for the sick and the poor, these findings suggest that they can find considerable support for such policies in a wide range of low and middle income countries. However, if they insist upon full cost-sharing, they may find their proposals appealing to a smaller constituency. The study also suggests that more detailed analyses of the factors that predispose people to favour or disfavour solidarity with the sick and the poor could guide policies aimed at persuading people to support such policies. For example, higher educational attainment in some countries was associated with greater support for solidarity, while in others it was associated with less support. In these latter countries, proponents of cost-sharing would want to investigate why education has this impact – whether due to the content of teaching or some other associated social patterning.

7 Conclusions

In conclusion, there appears to be wide support for assisting sick people and the poor with the costs of healthcare in the twenty-four countries that were studied. However, most people also express the opinion that such subsidies should be half of the cost or less. Investigating the factors that differentiate respondents suggest they are motivated by self-interest - with healthier people being less supportive of solidarity with the sick and the poor. On the other hand, the results were not consistent across countries, and so any statements must be viewed only as suggestive and should be interpreted with caution. Further research will be necessary to determine whether these findings are robust.

Had the results been more consistent across countries, it would have been possible to argue that some general universal patterns were emerging in the determinants of attitudes toward solidarity. The fact that the regressions yielded such variation may be due, in part, to problems of sampling or interpretation of questions. However, it is also very likely that the factors that differentiate individuals within any given country are really different. In this regard, further investigations would do well to find surveys with enough information to identify the differences between all six hypotheses outlined above, and to address the impact of beliefs on the effectiveness of redistributive mechanisms and on the causes of ill-health and poverty.

ANNEX

Analysis of Variance: Differences within and between countries regarding willingness to pay for health care of the sick and poor (when sick)

	Sum of squared deviations	Degrees of freedom	Mean square difference	Shares of variance (%)
Redistribution from healthy to sick				
Between groups	8144	23	354.0	8
Within groups	97417	102709	0.9	92
Total	105562	102732	1.0	
Redistribution from all to poor (when sick)				
Between groups	12651	23	550.1	9
Within groups	124511	102682	1.2	91
Total	137162	102705	1.3	

References

Alesina A., La Ferrara E. (2001). Preferences for redistribution in the land of opportunities. *NBER Working Paper Series*.

Alesina A, Angeletos GM (2005). Fairness and redistribution. *American Economic Review,* 95(4): 960-980.

Armitage C.J., Conners M. (2001). Social Cognitive Determinants of Blood Donation. *Journal of Applied Social Psychology,* 31.7: 1431-1457.

Arts W and Gelissen J (2001). Welfare states, solidarity and justice principles: Does the type really matter? *Acta Sociologica*, 44(4): 283-299.

Becker G.S. (1976). A Theory of Social Interactions, Chapter 12 in *The Economic Approach to Human Behavior.*

Charness G., Rabin M. (2002). Understanding social preferences with simple tests. *The Quarterly Journal of Economics, August 2002.*

Diaz A., Echevarria C. (2002). Solidarity, Transfers, and Poverty. *Review of Development Economics,* 6(3): 337-350.

Eisenberg N., Miller P.A. (1987). Empathy, sympathy, and altruism: empirical and conceptual links. Chapter 5 in Zamagni (ed.) *The Economics of Altruism.* (1995). Edward Elgar Publishing Limited.

Fehr E. (2000). Theories of fairness and reciprocity: evidence and economic applications. *CESifo Working Paper Series, No. 403.*

Gillinson S. (2004). Why cooperate? A Multi-Disciplinary Study of Collective Action. *Overseas Development Institute Working Paper 234.*

Greene (1999). *Econometric Analysis (4th edition).* Prentice-Hall.

Jaeger M (2009). United but divided: welfare regimes and the level and variance in public support for redistribution. *European Sociological Review*, 25(6): 723-737.

Komter A.E. (2001). The disguised rationality of solidarity: gift giving in informal relations. *Journal of Mathematical Sociology*, 25: 385-401.

McAndrew F.T: (2002). New Evolutionary Perspectives on Altruism: Multilevel-Selection and Costly-Signaling Theories. *American Psychological Society, 11.2: 79-82.*

Monroe K.R. (1994). A Fat Lady in a Corset: Altruism and Social Theory. *American Journal of Political Science,* Vol. 38.4: 861-893.

Mueller D (2003). *Public Choice III.* Cambridge University Press.

Preston S and de Waal F (2002). Empathy: Its ultimate and proximate bases. *Behavioral and Brain Sciences*, 25, 1–72.

Rushton J.P. (1982). Altruism and Society: A Social Learning Perspective. Chapter 30 in Zamagni (ed.) *The Economics of Altruism.* (1995). Edward Elgar Publishing Limited.

Selten R., Ockenfels A. (1998). An experimental solidarity game. *Journal of Economic Behavior and Organization,* 34: 517-539.

Svallfors S (1997). Worlds of welfare and attitudes to redistribution: a comparison of eight western nations. *European Sociological Review*, 13(3): 283-304.

Woolcock M., Narayan D. (2000). Social Capital: Implications for Development Theory, Research, and Policy. *The World Bank Research Observer,* 15.2: 225-249.