Who cares about health inequalities? Cross-country evidence from the World Health Survey

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Reduction of health inequalities within and between countries is a global health priority, but little is known about the determinants of popular support for this goal. We used data from the World Health Survey to assess individual preferences for prioritizing reductions in health and health care inequalities. We used descriptive tables and regression analysis to study the determinants of preferences for reducing health inequalities as the primary health system goal. Determinants included individual socio-demographic characteristics (age, sex, urban residence, education, marital status, household income, self-rated health, health care use, satisfaction with health care system) and country-level characteristics [gross domestic product (GDP) per capita, disability-free life expectancy, equality in child mortality, income inequality, health and public health expenditures]. We used logistic regression to assess the likelihood that individuals ranked minimizing inequalities first, and rank-ordered logistic regression to compare the ranking of other priorities against minimizing health inequalities. Individuals tended to prioritize health system goals related to overall improvement (improving population health and health care responsiveness) over those related to equality and fairness (minimizing inequalities in health and responsiveness, and promoting fairness of financial contribution). Individuals in countries with higher GDP per capita, life expectancy, and equality in child mortality were more likely to prioritize minimizing health inequalities.

Keywords   Inequality, equity, health inequalities, global health, resource allocation, prioritization

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KEY MESSAGES

- Individuals living in healthier, wealthier countries are more likely to place a higher priority on reducing health inequalities.

- Individuals living in low- and middle-income countries tend to place a higher priority on overall health improvement than reducing health inequalities.

- Global health policy may face a conflict between maximizing distributive justice and ensuring procedural justice with regards to health systems improvement.

Introduction

Reducing inequalities in health and health care between countries has long been a goal of global health policy. For example, on the first page of its inaugural World Health Report, the World Health Organization (WHO) noted that the life expectancy gap between low- and high-income countries can surpass 35 years, with some of the least developed countries spending less than US$4 per capita annually on health care—far less than high-income countries such as France and the United States, which each spend more that US$1800 per capita annually on health care (World Health Organization 1995: 1).

More recently, reducing within-country inequalities in health and health care has become part of the global health agenda (Braveman and Tarimo 2002; Houweling and Kunst 2010). The first page of the Final Report of WHO's Commission on Social Determinants of Health cites the same 30-year life expectancy gap between high- and low-income countries, but also observes that,

> 'within countries, the differences in life chances are dramatic and are seen worldwide. The poorest of the poor have high levels of illness and premature mortality. But poor health is not confined to those worst off. In countries at all levels of income, health and illness follow a social gradient: the lower the socioeconomic position, the worse the health . . . Putting right these inequities – the huge and remediable differences in health between and within countries – is a matter of social justice.' (WHO Commission on Social Determinants of Health 2008)

Given these calls for prioritizing within-country inequalities in health and health care, particularly within low-income countries, it is worth asking: who cares about health inequalities? Many higher-income countries have prioritized reduction of within-country inequalities through targeted programmes and policies (Townsend and Davidson 1982; Acheson 1998; US Department of Health and Human Services 2000; Hogstedt *et al.* 2004; Marmot 2010; Centers for Disease Control and Prevention 2011). It is also increasingly a priority among the health and health policy experts who populate the committees that issue the reports cited above. But is this priority shared by the populations targeted by these calls for prioritization of within-country inequalities?

We used international survey data to investigate this question. We examined which countries and regions of the world place higher priority on reducing inequalities in health and health care relative to other health system goals, and whether this prioritization is impacted by socio-demographic and country-specific health and socio-economic factors.

Methods

Study data

We used data from the World Health Survey (WHS) to assess individual preferences for prioritizing reductions in health and health care inequalities. The WHS was a cross-sectional survey administered in 70 countries (listed in Appendix 1) in 2002–03 to assess behavioural risk factors, mental health, chronic health conditions and interactions with the health care system (Üstün *et al.* 2003). The WHS's sampling frame covered 100% of a country's eligible population, and the target population included any male or female adult aged 18 and above. Australia, Brazil, Hungary, Turkey and Zimbabwe did not provide rankings on health goals and were excluded from our analysis. We used sampling weights provided by WHO for WHS countries. Sampling weights were unavailable for Austria, Belgium, Denmark, Germany, Greece, Guatemala, Italy, Netherlands, Slovenia and the United Kingdom, which were therefore self-weighted. We used post-stratification (Korn and Graubard 1999) in order to weight each country by its adult (age 15 and over) population size, using World Bank population estimates (World Bank 2011).

Outcomes

The WHS asked individuals to rank, in order of importance, five health system goals: (1) improving population health; (2) minimizing health inequalities; (3) improving health system responsiveness; (4) minimizing inequalities in health system responsiveness; and (5) fairness in financial contribution. Individuals were shown cards with the five goals and asked to put them in their preferred order (see Appendix 2). We measured individual preferences for reducing health inequalities by creating a binary variable for whether or not the respondent ranked minimizing health inequalities as the first health system goal.

Individual covariates

We included individual socio-demographic characteristics likely to influence preferences for health system goals. We included a categorical measure of education (<primary, primary, secondary, >secondary) and a measure of permanent income, as socio-economic characteristics have been shown to affect preferences for reducing inequalities (Gakidou *et al.* 2003). Permanent income was estimated using an asset-based index developed by Ferguson and colleagues (Ferguson *et al.* 2003), which has been used in previous cross-national studies of economic status and health in developing countries (Gakidou *et al.* 2007). This approach assumes that economic status is an unobserved latent variable and is estimated by a random-effects probit model using measures of household ownership of assets (e.g. refrigerator, radio, car, etc.), access to services (e.g. drinking water), and known predictors of income (e.g. age and education). Coefficients on the asset variables from the model indicate thresholds on the latent income scale, above which households are more likely to own particular assets; that is, if a household's estimated permanent income is greater than the asset threshold, there is a greater than 0.5 probability that they own the item. This asset scale is then applied to each household to estimate permanent income. Previous research has shown these estimates of household income to provide reliable, if imperfect, estimates of permanent income (Ferguson *et al.* 2003). Finally, we included a Likert-type measure of each individual's satisfaction with the way health care runs in their country, and a measure of the last time an individual needed health care for themselves or their child, as these may affect individual perceptions of health system functioning

(Blendon *et al*. 2001; Murray *et al*. 2001). Data on perceived health care needs were not available from Turkey.

Country-level covariates

We collected data on gross domestic product (GDP) per capita in 2002 or 2003 (depending on availability and expressed in constant 2005 international dollars), income inequality (as measured by the Gini coefficient), the percentage of GDP spent on health expenditures, and the percentage of total health expenditures spent on public health from the World Development Indicators (WDI) Database (World Bank 2011). Gini coefficients for countries without WDI data (China, Congo, Czech Republic, Denmark, France, Ghana, India, Kenya, Mauritius, Namibia, Netherlands, Portugal, Slovakia, United Kingdom) were supplemented using the Luxembourg Income Survey, the Central Intelligence Agency (CIA) Factbook and the United Nations. To evaluate whether preferences for reducing health inequality were associated with poorer average health or health inequalities, we also included estimates of disability-free life expectancy and total inequality in infant mortality. The measure of overall inequality in infant mortality ranges from 0 to 1 (1 being interpreted as complete equality), and was published in 2000 by the WHO (World Health Organization 2000).

Statistical analysis

We used descriptive tables and regression analysis to study the determinants of preferences for reducing health inequalities as a goal. Our main analysis used logistic regression, with the outcome being whether the individual ranked minimizing reducing inequalities first, the strongest possible preference for minimizing health inequalities. Because it could be argued that this is too strong a test, we also explored how health inequalities were ranked relative to other specific goals using rank-ordered logistic regression. The rank-ordered logistic model (Allison and Christakis 1994; Long and Freese 2006) compares the likelihood of ranking a set of alternatives against a base category. We set 'minimizing health inequalities' as the base category to allow comparisons against each of the other alternatives. All analyses were conducted using Stata 12. We used the cluster option in all models to adjust the standard errors to account for nesting of respondents within countries.

Results

Table 1 shows descriptive statistics for the sample. The highest average rank (1 = highest, 5 = lowest) was for improving population health (1.95), considerably ahead of the next most prioritized goal, improving health system responsiveness (2.81). Table 2 shows the overall frequency with which each of the five health goals was ranked for the entire WHS population. Improving overall population health dominates as the primary health system goal, with 58% of respondents ranking it first. Roughly 11% of respondents ranked reducing health inequalities as the 1st goal. In general, the two goals prioritizing population average outcomes were ranked first by 73% of the sample, whereas the three equality and fairness-related priorities were ranked first 27% of the time. There was also a clear preference for ranking fairness in financial contribution as

the least important goal (43%). Rankings for the 2nd–4th goals were more ambiguous. For example, improving health system responsiveness was most often ranked second (31%), but only slightly more frequently than reducing health inequalities (25%).

Figure 1 shows bivariate scatterplots of the relationship between the probability of ranking minimizing health inequalities first against GDP per capita (upper panel), equality in child health (middle panel) and disability-free life expectancy (lower panel). There was a general tendency for individuals in countries with higher GDP per capita, higher child health equality and longer disability-free life expectancy to prioritize minimizing health inequalities.

Table 3 shows results from the logistic regression analysis modelling the probability of ranking minimizing health inequalities as the first goal. The first column contains marginal effects of individual-level covariates on ranking minimizing health inequalities first, without any country-level covariates. While few of the individual-level characteristics were strong predictors, individuals with less than a secondary education were more likely than those with more education to prioritize reducing health inequalities. Individuals in the lower income quintiles were less likely than those in the top quintile to prioritize minimizing health inequalities. Those reporting greater dissatisfaction with a country's health care system were more likely to prioritize reducing health inequalities, while those reporting never needing health care were less likely to do so.

Model 2 (Table 3) shows the impact of adding country-level covariates on preference for reducing health inequality. Conditional on individual covariates, only GDP per capita emerged as an important determinant. According to this model, each US$10 000 increase in GDP per capita (just over 1 standard deviation) increased the probability of ranking minimizing health inequalities first by 5.5 percentage points [95% confidence interval (CI): 2.8, 8.2]. This effect was reduced by the inclusion of fixed effects for WHO region (Model 3 in Table 3). Controlling for regional fixed effects, countries with higher levels of equality in child mortality were more likely to rank reducing health inequalities first (marginal effect [ME] = 6.4, 95% CI: 2.2, 10.6). Conditional on individual and country-level characteristics, individuals in the European region were less likely than those in the African region to rank minimizing health inequalities first, though this effect was imprecise (ME = −12.1, 95% CI: −23.7, −0.4). Finally, after adjustment for individual covariates, country characteristics and regional fixed effects, individuals in the lowest income quintile were 3.2 (95% CI: 1.0, 5.3) percentage points less likely than those in the richest quintile to rank minimizing health inequalities first.

We obtained results similar to those reported in Table 3 when we used rank-ordered logistic regression to compare minimizing health inequalities against the other specific alternatives (Table 4). The coefficients in Table 4 represent the log-odds of ranking each alternative higher than health inequalities. With respect to individual characteristics, those with less recent need for health care had increased likelihood of preferring improving overall population health to reducing health inequalities. Increasing levels of reported dissatisfaction with a

Table 1 Individual demographic and health care characteristics, country characteristics, World Health Survey 2002–03

Variable	Observations	Mean	Standard Error (SE) Mean	Min	Max
Individual-level					
Age (years)	222 325	42.74	0.04	18	100
Female (%)	222 325	51.53	0.11	0	100
Urban (%)	222 325	35.45	0.10	0	100
Education (%)					
<Primary	222 325	28.49	0.10	0	100
Primary	222 325	19.68	0.08	0	100
Secondary	222 325	24.41	0.09	0	100
>Secondary	222 325	27.43	0.09	0	100
Marital status					
Married	222 325	71.76	0.10	0	100
Single	222 325	16.15	0.08	0	100
Not married/single	222 325	12.10	0.07	0	100
Health goal (rank)					
Overall health	221 935	1.95	0.00	1	5
Reducing health inequalities	222 325	3.10	0.00	1	5
Improving responsiveness	221 973	2.80	0.00	1	5
Reducing responsiveness inequality	221 665	3.47	0.00	1	5
Fair financial contribution	222 040	3.68	0.00	1	5
Self-perceived health (%)					
Very good	222 325	20.96	0.09	0	100
Good	222 325	38.63	0.10	0	100
Moderate	222 325	29.89	0.10	0	100
Bad/very bad	222 325	10.53	0.07	0	100
Last needed health care (%)					
<30 days ago	222 325	27.18	0.09	0	100
30 days–1 year ago	222 325	32.94	0.10	0	100
1 year–2 years ago	222 325	9.04	0.06	0	100
2 years–5 years ago	222 325	9.68	0.06	0	100
Never	222 325	21.17	0.09	0	100
Satisfaction with health care system					
Very satisfied	222 325	9.07	0.06	0	100
Fairly satisfied	222 325	45.08	0.11	0	100
Neither	222 325	29.78	0.10	0	100
Fairly dissatisfied	222 325	10.64	0.07	0	100
Very dissatisfied	222 325	5.42	0.05	0	100
Country-level					
GDP per capita, 2002 ($)	222 325	6178.25	18.13	546.22	63 183.19
Disability-free life expectancy (years)	222 325	59.18	0.02	29.40	73.10
Equality in child mortality	222 325	0.75	0.00	0.38	1.00
Income inequality (Gini coefficient)	222 325	38.57	0.01	22.80	70.70
Public health expenditure (% of health spending)	222 325	40.20	0.04	14.98	89.80
Health expenditures (% of GDP)	222 325	5.25	0.00	2.55	12.76

country's health care system was associated with a decreased likelihood of ranking improving population health above minimizing health inequalities. Interestingly, the higher probability of ranking minimizing inequality first seen among those in the lowest income quintile in Table 3 appears to result from preferring improving responsiveness (odds ratio [OR] = 1.30, 95% CI: 1.0, 1.7) and reducing inequality in responsiveness (OR = 1.34, 95% CI: 1.2, 1.6) to reducing health inequalities.

Table 2 Overall distribution of preferences for health goals, World Health Survey 2002–03

Health system goal	Rank and column %				
	1st goal	2nd goal	3rd goal	4th goal	5th goal
Improving population health	58.3	13.9	10.3	9.1	8.3
Improving health system responsiveness	14.6	30.5	25.3	19.6	10.1
Minimizing health inequalities	10.7	25.3	24.7	22.6	16.8
Fairness in financial contribution	8.9	15.5	16.9	15.9	42.8
Reducing inequality in responsiveness	7.5	14.8	22.8	32.8	22.0
Total	100.0	100.0	100.0	100.0	100.0

The effects of higher GDP per capita and childhood equality on ranking minimizing health inequalities first (Table 3) appear to be driven by individuals in higher GDP countries being less likely to rank improving population health over reducing health inequalities.

Table 5 shows the predicted probability (derived from the rank-ordered logistic model evaluated at the mean value of all model covariates) of ranking each alternative first for selected contrasts. Individuals in the highest (vs lowest) income quintile were more likely to rank minimizing health inequalities as the first goal (16.8% vs 14.9%). At the country level, 17.3% of those at the 85th percentile of GDP per capita (roughly US$12 000) ranked minimizing health inequalities as the first goal, compared with 14.7% of those near the 25th percentile (roughly US$1200). At a regional level the highest probability of ranking minimizing health inequalities first was in the Eastern Mediterranean region (24.7%), and the lowest was in the European region (7.6%)

Discussion

This study produced three main findings. First, among WHS respondents, there was a clear preference for prioritizing overall improvement in population health first, and fairness in financial contribution last, among the WHS options for health system goals. In general, individuals tended to prioritize goals related to overall improvement (improving population health and health care responsiveness) over those related to equality and fairness (minimizing inequalities in health and responsiveness, and promoting fairness of financial contribution).

Second, there was variation across countries in the prioritization of reducing health inequalities. Among WHS respondents, the probability of ranking minimizing health inequalities as the first goal was higher in countries with higher GDP per capita, life expectancy and equality in child mortality. Third, while the individual-level covariates in the WHS data were weak predictors of individual rankings, we found some evidence that poorer individuals were less likely than richer individuals to prioritize minimizing health inequalities.

To our knowledge, only one other survey of individual preferences for health system goals has been reported. Gakidou and colleagues examined the same five goals, using different methods, in the WHO's Multi-Country Survey Study of 51 countries in 2000–01 (Gakidou *et al*. 2003). They also found that higher GDP countries were more likely to give more weight to equality and fairness-related goals, but in contrast with our results they found that higher individual education was associated with decreased preference for minimizing health inequalities. However, the difference in results may be due to important differences in sample coverage and analytic methodology. First, there was substantial regional variation: their sample was dominated by countries in the WHO European region (63% of all countries vs 43% for our study) and included none from the WHO African region (vs 26% for our study). Second, their sample included a mixture of brief in-person interviews and postal surveys. Finally, they used a substantially different analytic technique by assigning relative weights to each of the five goals and using seemingly unrelated regression to estimate associations with individual and country characteristics, rather than the logistic models we used.

There are several possible reasons for the association between national health, wealth and health equality, and higher prioritization of health inequalities. First, prioritization of equality and fairness may be a driver of improved health, wealth and equality, especially if poorer individuals are at highest risk for poor health outcomes. This prioritization may result, by design or by accident, in support for policies and programmes that improve GDP, life expectancy and equality in child mortality.

Conversely, prioritization of equality and fairness may be a 'luxury' of healthier and wealthier populations. In countries that have already attained relatively high GDP and life expectancy, individuals may be less likely to see further improvements in average health and health care as a top priority, and thus more likely to prioritize equality and fairness goals. By contrast, individuals in countries with lower life expectancy and GDP may prioritize improvement in health and health care ahead of equality and fairness.

Third, many of the European countries with high life-expectancy whose residents favoured minimizing health inequalities have, over the past few decades, initiated programmes to address and bring attention to health inequalities (World Health Organization Regional Office for Europe 1999). Respondents' relatively higher prioritization of minimizing health inequality in these countries may reflect exposure to media coverage of these programmes and policy priorities. Finally, it remains possible that unmeasured factors—for example, characteristics of the health system in different countries, or mass attitudes or values regarding health and economic development—may be associated with better health, wealth and equality, and respondents' higher prioritization of reducing inequality.
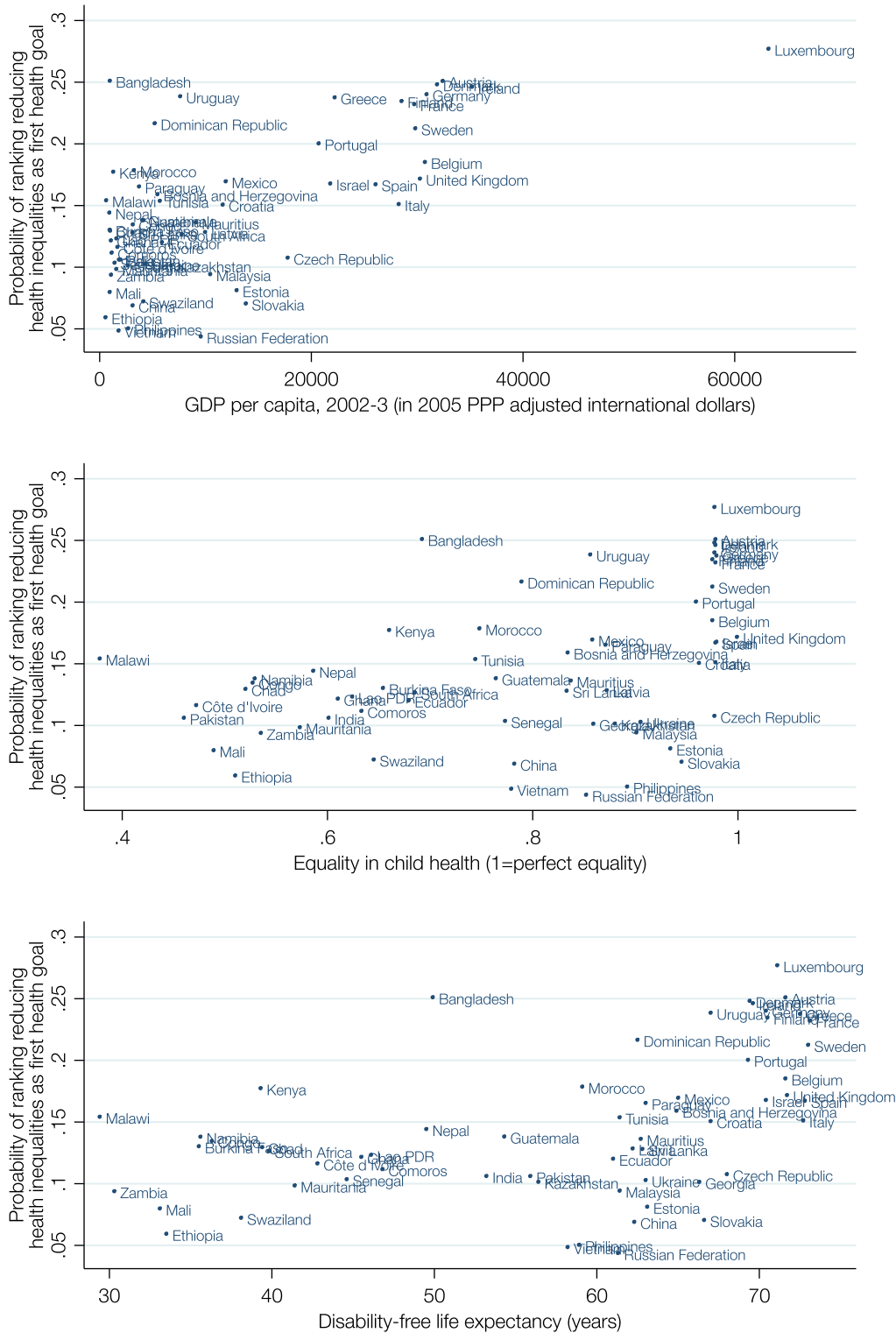
Figure 1 Probability of ranking minimizing health inequalities as the first health system goal vs GDP per capita, child health equality, and disability-free life expectancy, World Health Survey 2002–03
Note: PPP = purchasing power parity

Our analyses have some important limitations. First, the WHS is a cross-sectional survey, so we cannot determine any causal effects. Second, we used post-stratification to weight countries by population size. Weighting countries equally may lead to

different results, but based on Figure 1 it seems likely that the general patterns would remain similar. Third, the rank-ordered logistic model imposes the independence of irrelevant alternatives assumption (i.e. that preferences for reducing inequality

Table 3 Marginal effects (percentage point change) of individual and country characteristics on the likelihood of ranking minimizing health inequalities as the top health system goal, World Health Survey 2002–03

	Model 1		Model 2		Model 3	
	ME	95% CI	ME	95% CI	ME	95% CI
Individual characteristics						
Age group (years)						
15–24	0.59	(−0.6, 1.8)	1.14	(0.1, 2.2)	0.78	(−0.2, 1.8)
25–34	0.23	(−1.4, 1.8)	0.63	(−0.7, 1.9)	0.49	(−0.8, 1.8)
35–44	Ref		Ref		Ref	
45–54	−0.93	(−2.2, 0.4)	−0.88	(−2.3, 0.6)	−0.90	(−2.4, 0.6)
55–64	0.59	(−1.2, 2.4)	0.40	(−1.5, 2.3)	0.41	(−1.5, 2.3)
65–74	−0.63	(−3.1, 1.9)	−1.22	(−3.4, 0.9)	−0.97	(−3.2, 1.3)
75+	0.51	(−0.7, 1.7)	−0.39	(−2.0, 1.2)	0.05	(−1.5, 1.6)
Male	0.28	(−0.4, 1.0)	0.41	(−0.3, 1.2)	0.34	(−0.3, 1.0)
Urban	2.18	(0.5, 3.8)	0.84	(−0.2, 1.9)	0.15	(−0.7, 1.0)
Marital status						
Married	Ref		Ref		Ref	
Single	1.77	(−1.6, 5.2)	0.48	(−2.4, 3.3)	0.33	(−2.5, 3.1)
Divorced/widowed/separated	1.64	(0.1, 3.1)	0.04	(−0.8, 0.9)	0.00	(−0.6, 0.6)
Education						
<Primary	0.97	(−0.6, 2.6)	1.31	(−0.4, 3.0)	1.05	(−0.4, 2.5)
Primary	1.72	(0.2, 3.2)	1.67	(0.3, 3.1)	1.52	(0.5, 2.5)
Secondary	1.8	(0.0, 3.6)	1.62	(−0.2, 3.5)	1.43	(−0.4, 3.3)
>Secondary	Ref		Ref		Ref	
Household income						
Quintile 1 (lowest)	−0.19	(−6.2, 5.8)	1.12	(−2.4, 4.7)	−3.17	(−5.3, −1.0)
Quintile 2	−0.38	(−5.0, 4.3)	1.62	(−1.4, 4.6)	−2.29	(−4.6, 0.0)
Quintile 3	−3.49	(−6.5, −0.4)	−0.06	(−2.5, 2.4)	−2.49	(−3.8, −1.2)
Quintile 4	−3.42	(−7.5, 0.7)	−0.19	(−1.8, 1.5)	−0.67	(−2.3, 1.0)
Quintile 5 (highest)	Ref		Ref		Ref	
Self-perceived health						
Very good	0.45	(−1.4, 2.3)	0.59	(−1.4, 2.6)	0.63	(−1.4, 2.6)
Good	Ref		Ref		Ref	
Moderate	0.87	(−0.6, 2.3)	1.21	(0.0, 2.5)	1.46	(0.3, 2.6)
Bad/very bad	0.59	(−1.0, 2.2)	0.69	(−0.9, 2.3)	0.96	(−0.6, 2.6)
Last needed health care						
<30 days ago	Ref		Ref		Ref	
30 days–1 year ago	0.46	(−1.3, 2.2)	0.51	(−1.2, 2.3)	0.66	(−0.9, 2.2)
1 year–2 years ago	−1.28	(−3.2, 0.7)	−1.06	(−2.7, 0.6)	−0.84	(−2.2, 0.5)
2 years–5 years ago	−0.64	(−2.8, 1.5)	−0.62	(−2.5, 1.3)	−0.29	(−1.7, 1.1)
Never	−3.82	(−7.7, 0.0)	−2.68	(−6.1, 0.7)	−1.58	(−4.4, 1.2)
Satisfaction with health care system						
Very satisfied	3.06	(1.7, 4.4)	1.02	(0.4, 1.7)	0.78	(0.1, 1.4)
Fairly satisfied	Ref		Ref		Ref	
Neither	1.29	(0.0, 2.6)	1.68	(0.6, 2.8)	1.68	(0.5, 2.8)
Fairly dissatisfied	2.89	(0.7, 5.1)	2.39	(0.5, 4.3)	2.04	(0.0, 4.1)
Very dissatisfied	2.97	(1.6, 4.4)	2.23	(1.1, 3.3)	1.35	(0.0, 2.7)

(continued)

Table 3 Continued

	Model 1		Model 2		Model 3	
	ME	95% CI	ME	95% CI	ME	95% CI
Country characteristics						
GDP per capita [US$10 000s]			5.50	(2.8, 8.2)	2.38	(0.8, 4.0)
Disability-free life expectancy (years)			−0.41	(−0.9, 0.1)	−0.24	(−0.7, 0.2)
Child mortality equality (z-score)			3.74	(−2.8, 10.3)	6.37	(2.2, 10.6)
Income inequality (Gini coefficient)			−0.22	(−0.6, 0.2)	−0.30	(−0.6, 0.0)
Tot. health expenditures, % public, 2003			−0.19	(−0.4, 0.0)	0.00	(−0.1, 0.1)
% GDP for health expenditures, 2003			0.19	(−1.2, 1.6)	0.57	(−0.1, 1.2)
WHO Region						
Africa					Ref	
Americas					1.13	(−10.8, 13.0)
Eastern Mediterranean					6.81	(−7.3, 21.0)
Europe					−12.05	(−23.7, −0.4)
Southeast Asia					4.39	(−7.8, 16.5)
Western Pacific					−7.80	(−19.2, 3.6)

against a specific alternative do not depend on which other choices have already been made) (Long and Freese 2006). Fourth, while the WHS includes richer and poorer countries in all WHO regions, our estimates cannot be considered globally representative. Similar analyses with different countries could produce different results.

An additional limitation concerns the wording of the survey questions. The WHS describes minimizing inequalities in health as 'all people should have equal chances of being healthy', and minimizing inequalities in responsiveness as 'the health system is equally responsive to all people, no matter their wealth, social status, sex, age or religious or other beliefs'. The former describes inequalities between individuals, while the latter describes inequalities between social groups. This distinction, which has received attention in the literature on inequality measures (Murray et al. 1999; Braveman 2003), may introduce a subtle framing effect which could impact respondents' relative prioritization of these two options. Similarly, the questions related to equality and fairness are framed in terms of minimization, while the questions related to population average outcomes are framed in terms of maximization. More generally, the level of detail differs for each of the options, which could introduce an 'unpacking effect' that may influence respondents' prioritization (Van Boven and Epley 2003). Finally, while considerable efforts were made to make surveys available in local languages, results may be affected by different conceptualizations of 'equality', due to cultural differences or translation difficulties. For example, one recent US study found that the translation of the word 'fair' to the Spanish 'regular' led respondents to report poorer health than they would in English (Viruell-Fuentes et al. 2011).

Conclusion: why does it matter who cares about health inequalities?

Our findings have several implications regarding the prioritization of equality in global health policy. A number of scholarly articles (Braveman and Tarimo 2002; Marmot 2006; Ostlin et al. 2011) and reports (WHO Commission on Social Determinants of Health 2008) have recommended that more attention be paid to reducing within-country health inequalities within low- and middle-income countries. These documents generally emphasize the importance of simultaneously addressing both overall improvement and equality in health, and these goals are not necessarily mutually exclusive. Ideally, policies or programmes that target improvements in health and health system responsiveness would also reduce inequalities. For example, there is some evidence that reducing conventional coronary heart disease (CHD) risk factors in both high- and low-income countries would reduce both the overall population burden of CHD and absolute social inequalities in CHD (Lynch et al. 2006; Kivimäki et al. 2008; Rosengren et al. 2009).

However, in practice it may be difficult to simultaneously improve health outcomes and health systems performance, reduce inequalities, and ensure fairness in health and health care. General theories on the diffusion of innovations suggest that, because more advantaged individuals are often early adopters, innovations that improve health may exacerbate socio-economic inequalities in health (Rogers 2003). In particular, the differential uptake of new medical technologies (e.g. new drugs) and disease prevention strategies (e.g. cancer screening) by advantaged and disadvantaged groups may contribute to or even widen health inequalities (Link et al. 1998; Goldman and Smith 2005; Phelan and Link 2005; Levine et al. 2007). Therefore, policies or programmes that target the reduction of inequalities may differ from those that target improvements in average health or health system responsiveness within a country, and improvements in overall health can exacerbate relative health inequalities in the short term. Given this, David Mechanic has suggested that,

'Enhancing overall population health and reducing disparities are different objectives and are sometimes in conflict ... Concepts of justice might suggest sacrifice of some overall gains in population health to achieve a more

Table 4 Rank-ordered logistic regression results, World Health Survey 2002–03

	Log odds of preferring each outcome over reducing health inequalities							
	Overall health		Responsiveness		Resp. Inequality		Financial fairness	
	β	95% CI	β	95% CI	β	95% CI	β	95% CI
Constant term	−0.35	(−4.195, 3.504)	0.25	(−2.464, 2.963)	−0.91	(−2.428, 0.616)	−1.26	(−5.070, 2.553)
Individual characteristics								
Age group (years)								
15–24	−0.11	(−0.288, 0.077)	−0.02	(−0.133, 0.095)	−0.05	(−0.089, −0.002)	−0.04	(−0.132, 0.056)
25–34	0.05	(−0.015, 0.120)	0.1	(0.020, 0.178)	0.01	(−0.081, 0.108)	0.04	(−0.065, 0.135)
35–44	Ref		Ref		Ref		Ref	
45–54	0.03	(−0.012, 0.065)	−0.03	(−0.060, −0.008)	0.02	(−0.068, 0.103)	0.03	(−0.060, 0.117)
55–64	0.09	(−0.026, 0.214)	0.02	(−0.019, 0.067)	−0.1	(−0.179, −0.019)	0.08	(0.021, 0.142)
65–74	0.17	(0.051, 0.283)	0.11	(0.021, 0.208)	0.03	(−0.014, 0.068)	0.04	(−0.062, 0.148)
75+	0.06	(−0.123, 0.238)	0.13	(−0.079, 0.345)	−0.02	(−0.102, 0.067)	0.09	(−0.048, 0.236)
Male	0.13	(0.036, 0.230)	0.03	(−0.028, 0.085)	−0.01	(−0.048, 0.025)	0.09	(−0.012, 0.188)
Urban	−0.34	(−0.773, 0.083)	−0.02	(−0.124, 0.083)	0.06	(0.021, 0.106)	0.05	(−0.002, 0.105)
Marital status								
Married	Ref		Ref		Ref		Ref	
Single	−0.07	(−0.368, 0.235)	−0.03	(−0.192, 0.138)	−0.07	(−0.180, 0.031)	−0.06	(−0.150, 0.034)
Divorced/widowed/separated	0.1	(0.016, 0.188)	−0.01	(−0.100, 0.078)	−0.05	(−0.142, 0.043)	0.01	(−0.037, 0.054)
Education								
<Primary	−0.04	(−0.291, 0.211)	−0.12	(−0.204, −0.029)	0.01	(−0.044, 0.057)	0.1	(−0.012, 0.218)
Primary	−0.09	(−0.342, 0.164)	−0.1	(−0.151, −0.059)	0.01	(−0.056, 0.074)	0.07	(−0.048, 0.179)
Secondary	0	(−0.141, 0.148)	−0.11	(−0.166, −0.053)	−0.03	(−0.069, 0.009)	−0.05	(−0.130, 0.021)
>Secondary	Ref		Ref		Ref		Ref	
Household income								
Quintile 1 (lowest)	0.01	(−0.454, 0.484)	0.26	(0.003, 0.522)	0.29	(0.149, 0.439)	0.31	(−0.093, 0.723)
Quintile 2	0.07	(−0.332, 0.466)	0.25	(0.015, 0.484)	0.31	(0.155, 0.469)	0.18	(−0.235, 0.592)
Quintile 3	0.07	(−0.159, 0.294)	0.08	(−0.072, 0.242)	0.29	(0.185, 0.394)	0.12	(−0.036, 0.286)
Quintile 4	−0.04	(−0.271, 0.186)	0.04	(−0.053, 0.125)	0.18	(0.123, 0.238)	0.12	(0.065, 0.171)
Quintile 5 (highest)	Ref		Ref		Ref		Ref	
Self-perceived health								
Very good	0.05	(−0.044, 0.142)	−0.06	(−0.100, −0.013)	−0.01	(−0.097, 0.074)	−0.01	(−0.179, 0.154)
Good	Ref		Ref		Ref		Ref	
Moderate	−0.05	(−0.203, 0.105)	0.05	(−0.005, 0.099)	0.03	(−0.007, 0.071)	−0.02	(−0.060, 0.019)
Bad/very bad	−0.07	(−0.139, −0.001)	0.07	(−0.047, 0.187)	0.06	(−0.086, 0.202)	−0.05	(−0.302, 0.211)
Last needed health care								
<30 days ago	Ref		Ref		Ref		Ref	
30 days–1 year ago	0.02	(−0.057, 0.104)	0.01	(−0.070, 0.084)	0.05	(0.022, 0.072)	0.05	(0.008, 0.089)
1 year–2 years ago	0.17	(0.087, 0.257)	0.08	(−0.010, 0.164)	0.06	(−0.072, 0.188)	0.22	(0.150, 0.294)
2 years–5 years ago	0.19	(0.103, 0.273)	0.08	(−0.009, 0.179)	0.06	(0.016, 0.111)	0.05	(−0.210, 0.314)
Never	0.34	(0.244, 0.427)	0.14	(0.067, 0.223)	0.02	(−0.035, 0.071)	0.2	(0.076, 0.322)
Satisfaction with health care system								
Very satisfied	−0.04	(−0.210, 0.137)	−0.03	(−0.095, 0.027)	0	(−0.042, 0.042)	0	(−0.081, 0.075)
Fairly satisfied	Ref		Ref		Ref		Ref	
Neither	−0.19	(−0.326, −0.051)	−0.14	(−0.216, −0.059)	0.01	(−0.064, 0.094)	−0.1	(−0.163, −0.037)
Fairly dissatisfied	−0.35	(−0.651, −0.057)	−0.08	(−0.261, 0.101)	0.06	(−0.049, 0.172)	−0.09	(−0.266, 0.093)
Very dissatisfied	−0.39	(−0.604, −0.184)	−0.03	(−0.110, 0.053)	0.08	(0.030, 0.133)	−0.09	(−0.149, −0.027)

(continued)

Table 4 Continued

	Overall health		Responsiveness		Resp. Inequality		Financial fairness	
	β	95% CI	β	95% CI	β	95% CI	β	95% CI
Country characteristics								
GDP per capita [US$10 000s]	−0.37	(−0.635, −0.106)	−0.09	(−0.301, 0.120)	−0.03	(−0.191, 0.131)	0.21	(−0.084, 0.506)
Disability-free LE (years)	0.03	(−0.027, 0.083)	−0.01	(−0.055, 0.031)	0	(−0.027, 0.017)	−0.02	(−0.082, 0.043)
Child mortality equality (z-score)	−0.64	(−1.143, −0.135)	0.08	(−0.311, 0.470)	0.11	(−0.090, 0.303)	−0.19	(−0.746, 0.358)
Income inequality (Gini coefficient)	0.01	(−0.029, 0.050)	0.02	(−0.002, 0.042)	0.01	(0.002, 0.025)	0.02	(−0.007, 0.050)
Tot. health expenditures, % public, 2003	0	(−0.018, 0.018)	0	(−0.011, 0.012)	0	(−0.004, 0.012)	−0.01	(−0.027, 0.012)
% GDP for health expenditures, 2003	−0.11	(−0.216, −0.007)	−0.08	(−0.154, 0.001)	−0.01	(−0.058, 0.039)	0.01	(−0.085, 0.108)
WHO Region								
Africa	Ref		Ref		Ref		Ref	
Americas	−0.27	(−1.403, 0.860)	0.33	(−0.408, 1.061)	−0.06	(−0.502, 0.380)	0.26	(−0.764, 1.290)
Eastern Mediterranean	−1.24	(−2.628, 0.156)	0.17	(−0.730, 1.066)	0.15	(−0.383, 0.677)	0.34	(−0.764, 1.436)
Europe	1.18	(−0.225, 2.583)	0.79	(−0.031, 1.613)	0.12	(−0.323, 0.558)	0.71	(−0.353, 1.775)
Southeast Asia	−0.82	(−2.019, 0.388)	0.34	(−0.361, 1.041)	0.19	(−0.137, 0.513)	0.94	(0.165, 1.717)
Western Pacific	0.21	(−1.043, 1.466)	0.15	(−0.669, 0.971)	0	(−0.437, 0.439)	0.79	(−0.385, 1.959)

The header spanning row: **Log odds of preferring each outcome over reducing health inequalities**

Note: Estimates derived from a single model. Each coefficient estimates the log odds of preferring each outcome over reducing health inequalities.

equitable society. But what if policies that most enhance population health and increase disparities also bring large increments of improved health to those who are most disadvantaged? It is reasonable to accept disparities if the health of all groups is enhanced.' (Mechanic 2002: 50)

The results of our study indicate that there may be support for this trade-off between overall improvement and equality, particularly in low- and middle-income countries. Individuals in low- and middle-income countries may thus favour policies or programmes that improve overall health or health care, even if they do not reduce health inequalities, over those that target health equality and fairness per se.

The results of our study may also encourage us to rethink the role of expertise in setting the global health policy agenda. One study of a WHO report ranking health systems across countries, which relied entirely on a survey of public health experts, found little correlation with the views of laypersons living in those countries, particularly the poor and elderly (Blendon *et al.* 2001). While these differences may reflect a faulty comparison between measures of individual satisfaction and overall health system performance (Murray *et al.* 2001), there is some evidence of a gulf between lay and expert views on health and health care (Blendon *et al.* 1993).

The expert authors of articles and reports calling for greater attention to within-country health equality in low- and middle-income countries undoubtedly have the best interests of lay individuals in mind. However, these calls may not reflect the priorities of the individuals whose interests they champion. This raises questions regarding the proper place of non-experts in global health decision-making. If the preferences of laypersons from resource-poor countries are taken into account, global health policies may differ from expert recommendations, particularly with respect to the relative prioritization of overall improvements in health and health care, equality and fairness.

This observation impacts the constitution of global health governance and the pursuit of social justice. Two forms of justice are relevant to global health governance: *distributive justice*, which ensures the fair allocation of resources within and between countries; and *procedural justice*, which ensures that there is a fair process for allocating resources. Proponents of distributive justice argue that global health resources should be allocated in a way that promotes equity in health outcomes, access to health care, opportunities for health and the determinants of health (Daniels 2006). Proponents of procedural justice stress the importance of establishing fair procedures for resolving disagreements about the fair allocation of resources (Gutmann and Thompson 1997; Daniels 2000), ensuring that individuals who are affected by distributive decisions are adequately represented, and implementing distributive policies in a non-coercive manner (Ruger 2006).

Our findings suggest a potential conflict between these two forms of justice. On one hand, there is a growing consensus that distributive justice requires us to address within-country as well as between-country inequalities in health and health care, particularly in low- and middle-income countries. Doing so may require prioritizing policies and programmes that address equality and fairness rather than overall improvement, and de-prioritizing those that increase inequalities even if they improve overall health or health care. This includes policies and programmes that have successfully improved health and health care (but exacerbated inequalities) in high- and middle-income countries. For example, there is evidence that interventions that reduced overall infant mortality in Brazil between the 1960s and 1990s also increased relative inequalities (Victora *et al.* 2000), and it has been argued that interventions successful in reducing average smoking have exacerbated inequalities (Frohlich and Potvin 2008).

On the other hand, procedural justice requires us to ensure that the residents of low- and middle-income countries are

Table 5 Predicted probability of ranking alternative outcomes as the top health system goal, World Health Survey 2002–03

	Predicted probability of being ranked first				
	Improving population health	Improving health system responsiveness	Minimizing health inequalities	Reducing inequality in responsiveness	Fairness in financial contribution
Household income					
Quintile 1 (lowest)	41.2	22.1	14.9	12.2	9.5
Quintile 5 (highest)	45.8	19.2	16.8	10.3	7.9
GDP per capita [US$10 000s]					
25th percentile	47.5	19.5	14.7	11.2	7.2
85th percentile	38.6	21.0	17.3	12.7	10.4
WHO Region					
Africa	48.5	16.7	17.9	12.4	17.9
Americas	38.7	24.2	18.7	12.2	6.2
Eastern Mediterranean	19.5	27.2	24.7	19.9	8.8
Europe	67.0	15.6	7.6	5.9	3.9
Southeast Asia	24.0	26.2	20.0	16.8	13.0
Western Pacific	50.1	16.2	15.0	10.4	8.3

Notes: Derived from a single rank-ordered logistic regression model (see Table 4), estimated at the weighted mean of all model covariates.

adequately represented in global health priority-setting, particularly in the context of disagreements over the fair distribution of resources. Our results indicate that residents of these countries may not favour the prioritization of within-country health equality and fairness to the same degree as residents of high-income countries.

Clearly, more research is needed to better understand lay and expert values regarding global health priorities. Great caution should be taken in generalizing from survey results, which are heavily dependent on sample composition, survey design, measurement and analytic approach. Nevertheless, our preliminary results indicate that prioritizing health and health care equality and fairness in low- and middle-income countries may be fair according to principles of distributive justice, but it also may not reflect the preferences of those who will bear the burden of ensuing decisions.

Funding

Conflict of interest

We declare that we have no conflicts of interest.

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Appendix 1

Countries participating in the World Health Survey 2002–03, classified by World Health Organization and World Bank regions in 2003

	High income	Upper-middle income	Lower-middle income	Low income
Africa		Mauritius	Namibia South Africa Swaziland	Burkina Faso Chad Comoros Congo Côte d'Ivoire Ethiopia Ghana Kenya Malawi Mali Mauritania Senegal Zambia Zimbabwe
Americas		Mexico Uruguay	Brazil Dominican Republic Ecuador Guatemala Paraguay	
Eastern Mediterranean	United Arab Emirates		Morocco Tunisia	Pakistan
Europe	Austria Belgium Denmark Finland France Germany Greece France Ireland Israel Italy Luxembourg Netherlands Norway Portugal Slovenia Spain Sweden United Kingdom	Croatia Czech Republic Estonia Latvia Slovakia Hungary	Bosnia and Herzegovina Georgia Kazakhstan Russian Federation Turkey Ukraine	
Southeast Asia		Sri Lanka	Bangladesh India Myanmar Nepal	
Western Pacific	Australia	Malaysia	China Philippines	Laos Vietnam

Appendix 2

World Health Survey 2002–03 survey question on health system goals

Health Systems Goals

READ TO RESPONDENT: To answer the following question you need to understand what is meant by 'Health System Goals'. Five main goals have been identified:

(1) Improving the health of the population (population lives longer and with less illness).

(2) Minimizing inequalities in health between people (all people should have equal chances of being healthy).

(3) Improving responsiveness of the health system (this involves things like how quickly people are attended to; how respectfully people are spoken to by medical staff; how clearly things are explained; how convenient it is to reach different health services; how clean they are; and how much freedom there is to choose to see the doctor one wants).

(4) Minimizing inequalities/disparities in responsiveness (the health system is equally responsive to all people, no

matter their wealth, social status, sex, age or religious or other beliefs).

(5) Fairness in financial contribution (every household should pay a fair share towards the health system)

Now, I would like you to score these 5 goals in order of importance from the most important (1) to the least important (5) – Please, put the cards I will give to you in order of importance.

INTERVIEWER: GIVE RESPONDENTS CUE CARDS, WRITE THE CODE FROM EACH CARD NEXT TO THE RANK, STARTING WITH RANK 1 AS THE MOST IMPORTANT, TO RANK 5 AS THE LEAST IMPORTANT.