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ABSTRACT

The Measurement of Health Inequalities: Does Status Matter?*

Approaches to measuring health inequalities are often problematic in that they use methods that are inappropriate for categorical data. The approach here focuses on "pure" or univariate health inequality (rather than income-related or bivariate health inequality) and is based on a concept of individual status that allows a consistent treatment of such data. We use several versions of the status concept and apply methods for treating categorical data to examine self-assessed health inequality for the countries contained in the World Health Survey; we also use regression analysis on the apparent determinants of these health inequality estimates. Our findings indicate major differences in health-inequality rankings depending on the status concept. We find evidence that health inequalities vary with median health status alongside indicators of institutional performance.

JEL Classification: D63, H23, I18

Keywords: health inequality, categorical data, entropy measures, health surveys, upward status, downward status

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1 Introduction

Measuring health inequality presents a challenge quite different from the standard problem of measuring income or wealth inequality. The challenge principally lies in the measurement of health itself: health cannot be assumed to be directly and unambiguously observable and it may not make sense to treat it as a continuous variable. As a consequence one has to use indirect methods that may involve elicitation of a person's self-assessed health (SAH) status or explicit modelling using observables that are thought to be related to health. Such indirect methods can be problematic. So the purpose of this paper is to examine the main practical approaches to inequality measurement in the health context and the extent to which different assumptions about health status affect inequality comparisons.

Why are indirect approaches to health measurement typically problematic? There is a fundamental difficulty of measurement. One reason for this is the assumptions that have to be adopted in modelling health: if health status is taken as a latent variable, with what observables is it correlated? Typically, self-reported health is affected by cultural biases (Jylhä et al. 1998) and self-reporting biases (Groot 2000).[1] A second reason is that health cannot be taken as a monetary-equivalent measure and that, in many cases, it should be treated as an ordinal or categorical variable rather than a continuous variable: standard methods of inequality analysis and standard properties of inequality indexes are not applicable (Heien 2015, p. 83). So, how is one to measure inequality?

This paper addresses the main theoretical and practical difficulties presented by the measurability problem of health-status inequality and, in doing so, examines the problems of working with self-assessed health (SAH) indicators, the use of alternative approaches to the measurement health inequality and the information content of different concepts of status. We compare our approach to the case of inequality analysis based on a standard but arbitrary cardinalisation of health using conventional inequality indices. We examine the correlates of the different health-inequality measures and investigate some

[1] Some research suggests that SAH correlates with mortality (Heien 2015, Idler and Benyamini 1997). On the correlation between SAH and objective measures of health status see Bound (1991).

commonlyconjectured phenomena, such as the presence of a “health Kuznets curve”. Finally we investigate the role of a set of demographic characteristics and measures of institutional performance that could explain the emergence of health inequalities: the quality of government regulation and the rule of law can limit the efficacy of smoking bans; corruption and government effectiveness can influence the delivery of health services; voice, accountability and openness can exert an influence on people’s mental health. We find that status matters, cardinalisation matters and institutions matter.

Our results provide a simple means of comparing alternative ways of measuring inequalities of non-cardinal outcomes that may have significant policy implications. This is important when one takes account of the fact that measures of health inequality are used to rank health systems, and measures of well-being are used by the World Health Organisation and other government bodies to evaluate institutions and public policies.

We provide estimates of health inequalities using a measure of status that is not imposed through an arbitrary cardinalisation strategy, but uses the a recent approach that is explicitly designed to handle ordinal variables. We compare these estimates to those that would emerge from simple direct cardinalisations of health status and provide the first multi-country estimate of health inequalities using the status-inequality approach. Using this approach we further examine the determinants of status-inequality in order to investigate the relationship between health inequality and factors such as income, demographics and institutional variables.

The paper is organised as follows. Section 2 contains the theoretical background, section 3 introduces the data set and explains our empirical strategy, section 4 contains our results and section 5 concludes.

2 Health-inequality measurement – principles and practice

For a coherent approach to the measurement of health inequality we need two basic concepts and a methodology for measuring or estimating values of these concepts and then aggregating the values.

2.1 Basic concepts: health and status

If we were able to treat "health" like "wealth" then a person's health could be taken as a continuous variable that is, in itself, an objectively measurable and observable measure of a person's status. For a broadly-defined interpretation of health this is unrealistic. One could consider using proxies,[2] but perception and observation might not match (Sen 2002). Alternatively, one could focus on the inequality of individual components or aspects of health that can be objectively measured, but this is of limited interest and applicability.

Since there is no standard off-the-shelf measure of health status that is going to be generally suitable for inequality analysis, we need to be clear about two steps: (1) how to model health h_i for each individual $i = 1, ...n$ and, (2) given $\{h_1, ..., h_n\}$, how to model the status variable s_i that is to be used in inequality computation.

2.1.1 Individual health, h_i

Given the difficulties in observing a broadly defined indicator of individual h_i there are two main ways forward. First one might try estimate a health production function assuming the following kind of relationship:

$$h_i = \Phi(\mathbf{X}_i) + \varepsilon_i, \tag{1}$$

where Φ is the production function, $\mathbf{X}_i$ represents a vector of determinants of health (such as income, health inputs, demographics, institutions) and ε_i a random component. Specifying and estimating such a function is challenging because health status is a latent variable that cannot be observed.

The second approach is to model h_i thus:

$$h_i \in \{c', c'', c''', ...\}, \tag{2}$$

where c', c'', c''' represent different health categories. Many national and international surveys contain information on measures of SAH in categorical form; the categories may or may not have a natural ordering.

So, in principle, an individual's health h_i can take the form of a censored variable, an interval variable, or an ordered categorical variable, depending on the underlying assumptions about how to conceptualise it.

[2]Since the contribution of Idler and Benyamini (1997), categorical self-assessed measures of health are taken as a acceptable proxies for individuals

2.1.2 Individual status, s_i

How one models an individual's status depends in part on the way h_i is modelled. If one follows the production-function approach, it might be possible to use the h_i value as an indicator of health status, just as it pops out of equation (1), or a transformation of it. If one is using a specification such as that of equation (2) then several problems immediately arise: how to order the members of the set $\{c', c'', c''', ...\}$, how to calibrate the "distance" between members of the set of categories and so on. One might, alternatively, incorporate in the concept of status information about health and some other personal characteristic, such as income.

Whether one starts with equation (1) or (2) or something else, the analysis involves three main components: the extraction of suitable categorical variables on which to base health status, computation of cardinal imputations, status measures and associated inequality indices and rankings, and an analysis of cross-country inequality comparisons. Let us briefly look at the methods and limitations of the standard approaches to these issues.

2.2 Status and health inequality: standard approaches

The standard approaches to health inequality can broadly be divided into"bivariate" and "univariate" methods, depending on the concept of status that is invoked. Univariate methods appeal to the innate status associated with the equalisand, whilst bivariate methods rely on an external concept which typically is constructed from a measure of socio-economic status such as income or education (Erreygers and Kessels 2017; Asada et al. 2014).

Bivariate approaches typically use an observable measure of health alongside a rank measure of socio-economic status and apply concentration curve / index methods (Koolman and van Doorslaer 2004). At the heart of these approaches is the idea that a person's status should be based not just on a single health indicator but also on other indicators believed to co-vary with health. Individual status is usually taken to mean a person's position in the income hierarchy.[3] It is difficult to identify whether policies really affect *health* inequality, or simply affect determinants of health such as the distribution of material conditions.[4] Income and health have shown to be affected by

[3]See Marmot (2005), Wagstaff and van Doorslaer (2000). This was the position adopted in the early literature, with few exceptions such as Le Grand (1987).

[4]An attempt has been made to justify the approach on the basis of the principle of

reverse causality.[5] So using income as a measure of social hierarchy in SAH may underestimate income-related inequalities in health (Dowd and Todd 2011). Furthermore, the distribution should perhaps be adjusted to eliminate factors such as age or gender and, even if such adjustments are made, the approach typically ignores the contribution of essentially "avoidable" determinants of health, or even potentially "ethically legitimate" differences in health resulting from preventive effort and choice (Le Grand 1987).

Univariate approaches are an application of the analysis of inequality of outcome. They typically focus on specific cardinal indicators such as self-reported health, life expectancy or measures of hypertension; they can, in principle, be analysed using conventional inequality measures. But uncritical application of inequality tools designed for other purposes may miss important points such as the possibility that health might affect income prospects (Costa-Font and Ljunge 2018). Some socio-economic difference in health may not be pure socio-economic inequalities but are determined by lifestyle or poor early-life choices (Fleurbaey and Schokkaert 2009, 2012, Wagstaff et al. 1991): should one attempt to remove all avoidable components from the analysis so as to focus solely on the remaining "legitimate" health inequalities? In addition, many important health status indicators are categorical variables that have no natural cardinalisation, although one could try to circumvent this by imputation (Fonseca and Jones 2003) either through subjective evaluation by individuals (for example on a Likert scale) or by making use of quality of life indices (for example, EuroQuol-EQ5).[6] The economic rationale for commonly used cardinalisation methods is seldom discussed; the practical implications of using one method rather than another and cardinalisation can be an important source of bias (Costa-Font and Cowell 2013).[7]

income-related health transfers (Bleichrodt and van Doorslaer 2006, Fleurbaey 2006, Fleurbaey and Schokkaert 2012, page 1012), the plausibility of which is questionable.

[5] For instance, Ettner (1996) examines the effect on different health proxies, and rejects the null hypothesis of income exogeneity.

[6] The same procedure can be applied to entities that do not have a natural ordering, such as vectors of attributes or endowments and is similar to one of the standard theoretical approaches to the measurement of multidimensional inequality (Maasoumi 1986, Tsui 1995). However the approach faces serious objections such as the arbitrariness of the cardinalisation and of aggregation.

[7] A meta-regression analysis shows that cardinalisation matters (Costa-Font and Hernández-Quevedo 2013).

2.3 Alternative approaches using categorical data

In view of the limitations of the approaches discussed in section 2.2 it is important to consider approaches that use categorical data directly, without trying to impose a particular cardinalisation *a priori*.

The theoretical literature on the problem of making inequality comparisons when the underlying equalisand is ordinal has mainly resulted in a number of rather limited propositions that are difficult to interpret or apply.[8] However, recent work on the analysis of distributions of categorical variables has shown how natural interpretations of individual *status* can be used to provide a robust approach to the inequality-measurement problem in this context without resort to arbitrary cardinalisation of ordinal concepts (Cowell and Flachaire 2017). The status concept is similar to concepts used in poverty and relative deprivation and in recent approaches to the inequality of opportunity (de Barros et al. 2008).

Status interpreted as an individual's position in the health distribution is important in understanding several relationships in the economics of health. For example Costa-Font and Costa-Font (2009) and Hausman et al. (2002) show that effect of income on SAH depends in part on the individual's position in the health distribution: this finding is potentially important in understanding the persistence of health inequalities over time, and more specifically suggest that their effect depends on individual position within a given health distribution. In the present context the status approach gives rise to an alternative way of making inequality comparisons; it also gives rise to a set of inequality indices that incorporate conventional distributional views such as degree of inequality aversion and that can be applied to commonly-used measures of individual well-being.

The Cowell and Flachaire (2017) approach tackles the problem by separating out the two components of inequality measurement mentioned in the introduction, the equalisand and the aggregation method. Each of these is underpinned by an axiomatic argument that goes based on first principles. The resulting method amounts aggregates the discrepancies between each person's actual status and some status reference point. For applications such

[8]It involves a reworking of traditional inequality-ranking approaches focusing on first-order dominance criteria (Abul Naga and Yalcin 2008, Allison and Foster 2004, Zheng 2011. It is commonly suggested that the median could be used as an equality concept (Abul Naga and Yalcin 2010). But the approach runs into difficulty if quantiles are not well-defined, as may happen in the case of categorical variables.

as income or wealth, where the equalisand has a natural cardinalisation, then it makes sense to define status as income or wealth. However, where only ordinal information is available, as with categorical data on health status, then we have to do more. Suppose that information is categorical, it can be shown that, if there are n_k persons in category $k = 1, 2, 3, ...K$ (in ascending order), the status of person i who is currently in category $k(i)$ must be a function of either $\sum_{\ell=1}^{k(i)} n_\ell$ or $\sum_{\ell=k(i)}^{K} n_\ell$. Normalising by the size of the total population $n := \sum_1^K n_k$, person i's status is given by either the "downward-looking" version

$$s_i = \frac{1}{n}\sum_{\ell=1}^{k(i)} n_\ell, \tag{3}$$

or by the "upward-looking" counterpart of (3):

$$s_i' = \frac{1}{n}\sum_{\ell=k(i)}^{K} n_\ell; \tag{4}$$

If there were perfect equality (everyone in the same category) then both (3) and (4) take the value 1; this maximum-status value is the natural reference point.

On the basis of a small number of standard axioms Cowell and Flachaire show that inequality must take the form of an index in the following family, indexed by α:

$$I_\alpha(\mathbf{s}) = \begin{cases} \frac{1}{\alpha(\alpha-1)}\left[\frac{1}{n}\sum_{i=1}^n s_i^\alpha - 1\right], & \text{if } \alpha \neq 0, \\ \\ -\frac{1}{n}\sum_{i=1}^n \log s_i, & \text{if } \alpha = 0. \end{cases} \tag{5}$$

where $\alpha < 1$ is a parameter indicating the desired sensitivity of the index to a particular part of the income distribution: for low values of α the index $I_\alpha(\mathbf{s})$ is particularly sensitive to values of s_i close to zero. If status is given by, respectively, (3) or (4), then we have inequality using a downward- or upward-looking status concept.

This provides a family of indices that is suitable for making univariate comparisons of inequality in terms of health status. In addition, members of the family can be adjusted by different health-inequality aversion parameters in a flexible way as other inequality indices. In what follows we shall suggest a way of using this to make health-inequality comparisons internationally.

Clearly equation (5) has a form similar to the well-known Generalised Entropy class of inequality indices (Cowell 1980, Shorrocks 1980)

$$G_\alpha(\mathbf{s}) = \begin{cases} \frac{1}{\alpha(\alpha-1)}\left[\frac{1}{n}\sum_{i=1}^{n}\left[\frac{s_i}{\mu(\mathbf{s})}\right]^\alpha - 1\right], & \text{if } \alpha \neq 0, 1 \\ \\ -\frac{1}{n}\sum_{i=1}^{n}\log\frac{s_i}{\mu(\mathbf{s})}, & \text{if } \alpha = 0, \\ \\ \frac{1}{n}\sum_{i=1}^{n}\frac{s_i}{\mu(\mathbf{s})}\log\frac{s_i}{\mu(\mathbf{s})}, & 1, \end{cases} \tag{6}$$

where $\mu(\mathbf{s})$ is the mean of the vector $\mathbf{s}$. Whereas $I_\alpha(\mathbf{s})$ has the reference point 1 the GE index $G_\alpha(\mathbf{s})$ has the reference point $\mu(\mathbf{s})$ and, obviously, this only makes sense where status is cardinal, in other words, if status is defined in such a way that it is meaningful to add the status values together. With ordinal data one could impose an arbitrary cardinalisation and, in section 4 we will try out the performance of $G_\alpha(\mathbf{s})$ for two such arbitrary cardinalisations and compare them with the theoretically appropriate $I_\alpha(\mathbf{s})$.

3 Data and Methods

3.1 Data

It is clear that the underlying data and the health-status indicator derived from it could be of the following forms:

Continuous, censored. In some circumstances, health status can be measured using a censored continuous variable (for example when visual analogue scales are employed). However, there are still problems related to focal responses so that certain points in a scale are more common than others (De Boer et al. 2004).

Ordinal. Given the categorical nature of SAH, it may be reasonable to take the ordering of question responses as naturally given and to employ techniques designed for ordered variables. For example, an ordered probit model, could be used capture the degree of intensity of health or ill health, without explicitly cardinalising the health concept.

Our approach requires quantitative analysis of internationally comparable data that contain measures of health status. Accordingly the main data source to be used is the World Health Survey which contains data from seventy countries; it collects comparable multidimensional micro-data on income, employment education and health. There are two reasons for the choice of this data base: first, its great advantage for comparative work; second, its standardised world-wide structure can assist in examining cross country patterns across heterogeneous world regions that exhibits different levels of economic and social development.

The World Health Survey (WHS) is a general population survey, developed by the World Health Organization to address the need for reliable information and to cater to the increased attention to the role of health in economic and human development. Other options, such as the International Social Survey Program, the European Social Survey or Gallup, are not as rich in terms of controls, countries included and measurement detail. Indeed, the survey contains data from randomly selected adults (i.e. older than 18 years of age) who reside in seventy-one countries which implemented household face-to-face surveys, or computer-assisted personal interviews in 2002. Sample sizes range from 1,000 to 10,000, which should suffice to compute reliable inequality estimates.

Our measure of health status is the standard measure of SAH status widely used in the literature; this is a categorical measure of health is based on the responses to the question "how would you rate your health today?" and yields a personal evaluation of overall health with potential responses in five categories ranging from "very good" to "very bad". As a measure, it suffers from cultural adaptation problems that make cross-country comparison challenging, but it appears to be an adequate measure for computing within-country inequalities.[9]

3.2 Cardinalisation

For categorical data a simple way to process the data is to rank the values underlying the latent variable health. But the "distance" between categories is unknown and an an arbitrary scale may not be informative; there is no

[9]The detailed values are given in Table 1 in the on-line appendix. An example of cultural adaptation problems in the case of SAH is that the evaluation "excellent health" might receive different interpretations according to country.

theoretically sound consensus strategy to measure such a latent variable from categorical responses

3.2.1 "Natural" cardinalisation?

In some cases it is possible to employ existing quality-of-life measures of health status that are available in health surveys to impute a cardinal value to the categorical responses to the SAH questions, for example the imputation of values from the Health-Related Quality of Life scales as in Van Doorslaer and Jones (2003), Fonseca and Jones (2003).

Another way forward is to obtain an index based on scaling the ordered variable to obtain a normalised health index (Cutler and Richardson 1997). However, this still requires arbitrary assumptions on the value and distribution of a person's health status. Makdissi and Yazbeck (2014) address the question of the categorical measurement of health variables by using a ratio-scale transformation that modifies the information provided and focuses on the breadth rather than the depth of the health-indicator information. However, they lose some important information on the distribution of the health variable and they focus on income-related health inequalities which involves important and questionable assumptions

So, instead, some papers interpret SAH status as a individual's categorisation into an interval, which can be ascertained by finding a link between self-assessed measures of health and some health utility indices. For example, Van Doorslaer and Jones (2003) use the equivalent cardinal value of the cut-off point of each response to the ordinal question was obtained so as to estimate the cardinal value of SAH using an interval-regression approach.

3.2.2 A regression approach?

Both ordered and interval regressions models can be used to transform a categorical outcome into a continuous variable based on the parameters of the regression. So, if the health variable allows an unambiguous ordering, then a logit or probit regression model will take into account the structure of the data.[10] By assuming an order the probability of respondents' classifying themselves on a specific scale can modelled in a standard fashion. However, even where this is an improvement with respect to binary measures of health

[10] See for example the logistic regression technique used by Kunst and Mackenbach (1994).

for the purposes of measuring health inequality, it is still difficult to interpret the meaning of a change in the order between scales of SAH status.

However, the transformation is dependent in the covariates of the regression and on the arbitrary nature of different variable categories. The strategy we pursue here addresses this latter point and provides an alternative cardinalisation method, that we argue is more suitable to measure inequalities in health.

3.2.3 Pure health inequality?

Instead of trying to use the structure of the data to produce a cardinalisation of health status, Allison and Foster (2004) developed a stochastic dominance approach to univariate ("pure") health inequalities, which is not limited by the assumptions implicit in the income-related health inequality approach. However, the range of results that are available from this approach is narrow and so it is likely to be limited in application.

In this paper we use the methodology discussed in section 2.3 to undertake international comparisons of inequality of SAH status.

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3.3 Inequality comparisons

The approach in this paper is to apply the method of section 2.3 to make univariate inequality comparisons of SAH status, using the WHS international data set. This method takes account of the categorical nature of the data,and permits the use of a variety of status measures based on the data. The approach involves the following steps:

1. We estimate self-assessed health inequality using the class of measures (5) for values of the sensitivity parameter α ranging from -2 (effectively negative infinity) to $+0.99$ (arbitrarily close to the upper bound of α). We do this both for both downward-looking status $\mathbf{s}$ and upward-looking status $\mathbf{s}'$.

2. We compare these measures of health inequality with those that would emerge from conventional inequality indices applying a standard, but arbitrary, cardinalisation. In fact we take two different such cardinalisations. The first numbers the five health categories from low to high

as (1,...,5) so that, if there are $(n_1, ..., n_5)$ observations in each of the categories, the status vector is given by.

$$\mathbf{s}^{\uparrow} := \left(\underbrace{1,...,1}_{n_1},\underbrace{2,...,2}_{n_2},\underbrace{3,...,3}_{n_3},\underbrace{4,...,4}_{n_4},\underbrace{5,...,5}_{n_5}\right). \tag{7}$$

To capture the idea of inequality of ill health we also look at the "inverse" case where the the same five health categories are labelled (5,...,1).[11]

$$\mathbf{s}^{\downarrow} := \left(\underbrace{5,...,5}_{n_1},\underbrace{4,...,4}_{n_2},\underbrace{3,...,3}_{n_3},\underbrace{2,...,2}_{n_4},\underbrace{1,...,1}_{n_5}\right) \tag{8}$$

We then compute $G_\alpha(\mathbf{s}^{\uparrow})$ and $G_\alpha(\mathbf{s}^{\downarrow})$, using the same values of α as for the ordinal inequality statistics computed in step 1

3. We use rank-correlation analysis to examine the association of country inequality orderings under the alternative definitions of status (3), (4), (7) and (8) for different values of the inequality sensitivity parameter. In other words we look at the correlations between pairs from $\left\{I_\alpha(\mathbf{s}), I_\alpha(\mathbf{s}'), G_\alpha(\mathbf{s}^{\uparrow}), G_\alpha(\mathbf{s}^{\downarrow})\right\}$ for a number of values of α.

4. We regress $I_\alpha(\mathbf{s})$ (downward) and $I_\alpha(\mathbf{s}')$ (upward) on a number of explanatory variables in order to gain insight on the factors associated with high health inequality. Focusing on inequality avoids problems that may arise from systematic response bias between countries.[12] We carry out a similar analysis using the direct and inverse cardinalisations, $G_\alpha(\mathbf{s}^{\uparrow})$ and $G_\alpha(\mathbf{s}^{\downarrow})$.

5. Furthermore we examine possible patterns of health inequality by looking at the way in which (i) $I_\alpha(\mathbf{s})$ for each country varies and (ii) the way country orderings change as the parameter α varies.

[11] The different status measures here address the so-called: 'mirror problem' discussed by Clarke et al. (2002) who find that concentration indexes for SAH show inconsistent results when 'health' or 'ill-health' is as a dependent variable.

[12] Comparing median categories across countries is regarded as uninformative given that some countries habitually over-report. The term "moderate health" means different things across countries because people's expectations are different. Some progress has been made in using anchoring vignettes that is increasingly used to correct for this type of bias see Kapteyn et al. (2007) and Rice et al. (2012).

3.4 Inequality regression Analysis

What factors underlie the SAH-inequality rankings for different specifications of the status variable? We can use standard regression analysis to address this question, assuming a linear relationship for the variables that may potentially influence health inequalities by country.

The data are mainly taken from the *WH*S, and cover 70 countries. The dependent variables are country-specific inequality levels – see the definitions of I_α, G_α in (5) and (6) – evaluated for downward-looking and upward-looking status ($\mathbf{s}$and $\mathbf{s}'$) in the case of I_α, and for simple and inverse cardinalisations of SAH ($\mathbf{s}^\uparrow$, and $\mathbf{s}^\downarrow$) in the case of G_α. Given the small number of observations we limit the number of variables to avoid problems of limited degrees of freedom: we consider median SAH (H_i), health expenditure (E_i), the country-specific income (Y_i),country-specific characteristics, X_i, and indicators of institutional performance, Z_i. The left-hand and right-hand sides of Table 1 provide the sample statistics for the dependent and independent variable respectively.

The estimated equation is as follows:

$$\{I_\alpha, G_\alpha\} = \gamma_0 + \gamma_1 H_i + \gamma_2 E_i + \gamma_3 Y_i + \gamma_4 X_i + \gamma_5 Z_i + e_i \qquad (9)$$

where e_i is a random error term.[13] We use the model (9) to address the question whether the four inequality indicators $I_\alpha(\mathbf{s}), I_\alpha(\mathbf{s}'), G_\alpha(\mathbf{s}^\uparrow), G_\alpha(\mathbf{s}^\downarrow)$ are driven by the same country-specific determinants. The analysis will allow us to investigate other issues such as whether an improvement in government effectiveness or in income would reduce health inequalities, whether there is a Kuznets curve in health and the potential impact of changes in the composition of a country's on health inequality. This is pursued in section 4.

4 Results

Does the concept of status matter empirically when comparing SAH-inequality across countries? We address this question in three ways: graphical analysis,

[13]In addition to the preferred specification presented in section 4.3 below we ran a number of alternate specifications, presented in Tables 6 and 7 of the on-line appendix. All specification suggests consistent results: our preferred specification is the one including the most complete set of covariates.

Dependent Vars	Mean	Std. Err.	Independent Vars	Mean	Std. Err.
Ordinal inequality indices			median health	2.1286	0.009348
$I_{-2}(\mathbf{s})$	34.48	7.293	health expenditure	6.536	0.05955
$I_{-1}(\mathbf{s})$	1.185	0.01735	percapita GDP	14040	379.6
$I_0(\mathbf{s})$	0.6014	0.004337	% female population	50.51	0.06265
$I_{0.99}(\mathbf{s})$	34.00	0.2374	% population over 65	9.077	0.1438
$I_{-2}(\mathbf{s}')$	1.124	0.1050	control of corruption	0.1261	0.02663
$I_{-1}(\mathbf{s}')$	0.5339	0.01606	rule of law	0.1027	0.02580
$I_0(\mathbf{s}')$	0.5306	0.005766	political stability	0.05932	0.02334
$I_{0.99}(\mathbf{s}')$	33.98	0.2378	regulatory quality	0.1699	0.02487
			government effectiveness	0.1961	0.02639
Cardinal inequality indices			voice and accountability	0.1291	0.02603
$G_{-2}(\mathbf{s}^{\uparrow})$	0.05951	0.003125	openness	77.23	0.5143
$G_{-1}(\mathbf{s}^{\uparrow})$	0.04431	0.002068	*Regional dummies*		
$G_0(\mathbf{s}^{\uparrow})$	0.03652	0.00158	East Asia	0.07143	0.007479
$G_{0.99}(\mathbf{s}^{\uparrow})$	0.03238	0.001356	Europe and Central Asia	0.4143	0.01228
$G_{-2}(\mathbf{s}^{\downarrow})$	0.1270	0.003103	Latin America	0.1000	0.006421
$G_{-1}(\mathbf{s}^{\downarrow})$	0.1018	0.002676	Middle East	0.05714	0.005787
$G_0(\mathbf{s}^{\downarrow})$	0.08812	0.002414	South Asia	0.07143	0.006421
$G_{0.99}(\mathbf{s}^{\downarrow})$	0.08216	0.002465	Sub-Saharan Africa	0.2571	0.01090

Notes. Median health is the median value of self-reported health. Health expenditure is in thousands of dollars per head. Control of corruption, rule of law, regulatory quality, government effectiveness, voice and accountability, openness, political stability are indicators of institutional characteristics produced by the World Bank. Other data from the World Health Organisation.

Table 1: Summary Statistics

Table 2: Pairwise correlations for inequality using different status concepts

	$\alpha=-2$			$\alpha=-1$	
	$I_{-2}(\mathbf{s})$	$I_{-2}(\mathbf{s}')$		$I_{-1}(\mathbf{s})$	$I_{-1}(\mathbf{s}')$
$I_{-2}(\mathbf{s})$	1	-0.1274	$I_{-1}(\mathbf{s})$	1	-0.8385*
$G_{-2}(\mathbf{s}^{\uparrow})$	0.2841	-0.4419*	$G_{-1}(\mathbf{s}^{\uparrow})$	0.4785*	-0.8582*
$G_{-2}(\mathbf{s}^{\downarrow})$	-0.5893*	0.3056*	$G_{-1}(\mathbf{s}^{\downarrow})$	-0.6283*	0.1543

	$\alpha=0$			$\alpha=0.99$	
	$I_{0}(\mathbf{s})$	$I_{0}(\mathbf{s}')$		$I_{0.99}(\mathbf{s})$	$I_{0.99}(\mathbf{s}')$
$I_{0}(\mathbf{s})$	1	0.363*	$I_{0.99}(\mathbf{s})$	1	0.7395*
$G_{0}(\mathbf{s}^{\uparrow})$	0.7695	0.6389*	$G_{0.99}(\mathbf{s}^{\uparrow})$	0.7972*	0.798*
$G_{0}(\mathbf{s}^{\downarrow})$	-0.2605*	0.7389*	$G_{0.99}(\mathbf{s}^{\downarrow})$	0.3202*	0.3286*

Notes. Each element in the table reports an estimate of the pairwise correlation between inequality for two status concepts drawn from $\{\mathbf{s}, \mathbf{s}', \mathbf{s}^{\uparrow}, \mathbf{s}^{\downarrow}\}$, using I_α or G_α as appropriate and a given value of the sensitivity parameter α.
* significant at the 5% level.

correlations of country rankings and regression analysis.

4.1 Visual and Graphical Analysis

To illustrate whether the different status concepts produce different results in terms of inequality rankings Figure 1 shows the geographical distribution of inequality for the four concepts of status (downward-looking ordinal $\mathbf{s}$ upward-looking ordinal $\mathbf{s}'$, simple cardinal $\mathbf{s}^{\uparrow}$, inverse cardinal $\mathbf{s}^{\downarrow}$). It takes a central value of the sensitivity parameter, $\alpha = 0$. It is immediately clear that the different status concepts reveal quite different inequality patterns: see, for example, the switch between the relative position of India and Russia in inequality rankings as one switches from downward-looking status $\mathbf{s}$ to upward-looking status $\mathbf{s}'$. Figure 2 shows how the distribution of inequality changes with the sensitivity parameter. It is evident that changing the value of α changes the inequality ranking of the countries, but with no clear patterns: although Russia's inequality ranking continually increases with α, India achieves the highest inequality ranking at $\alpha = 0$, and Brazil at $\alpha = -1$.

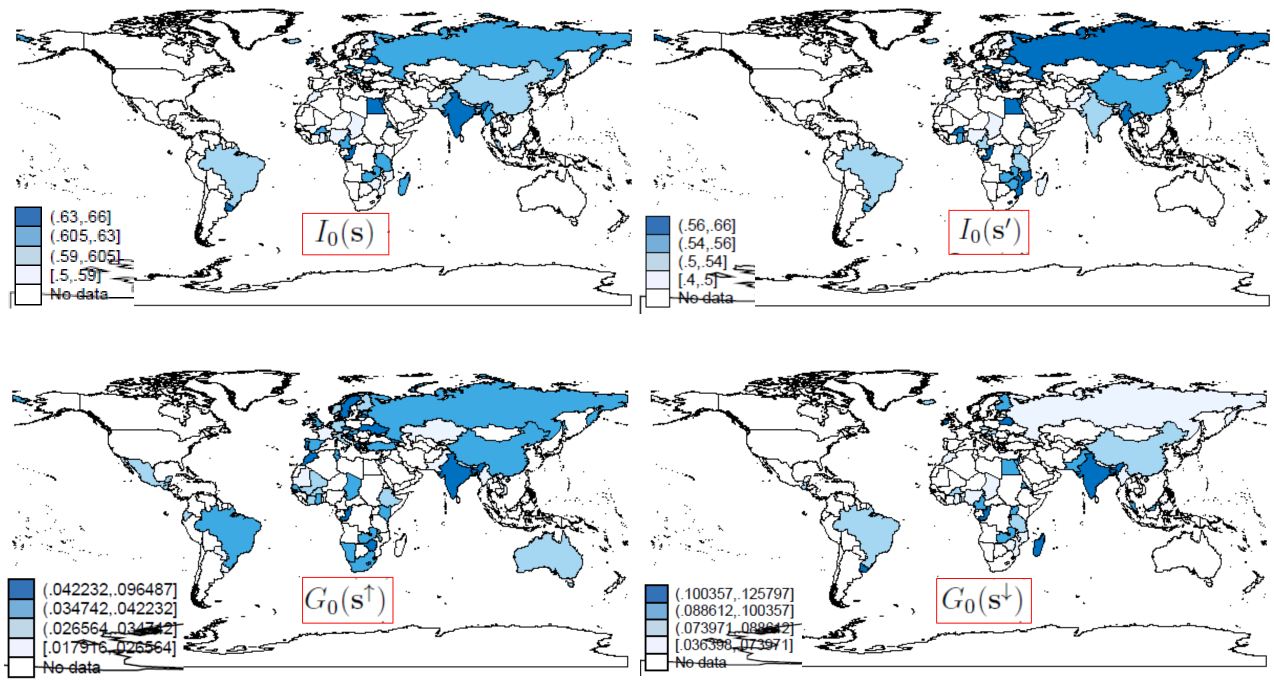

Figure 1: Country distribution of inequality: four different status concepts ($\alpha = 0$)

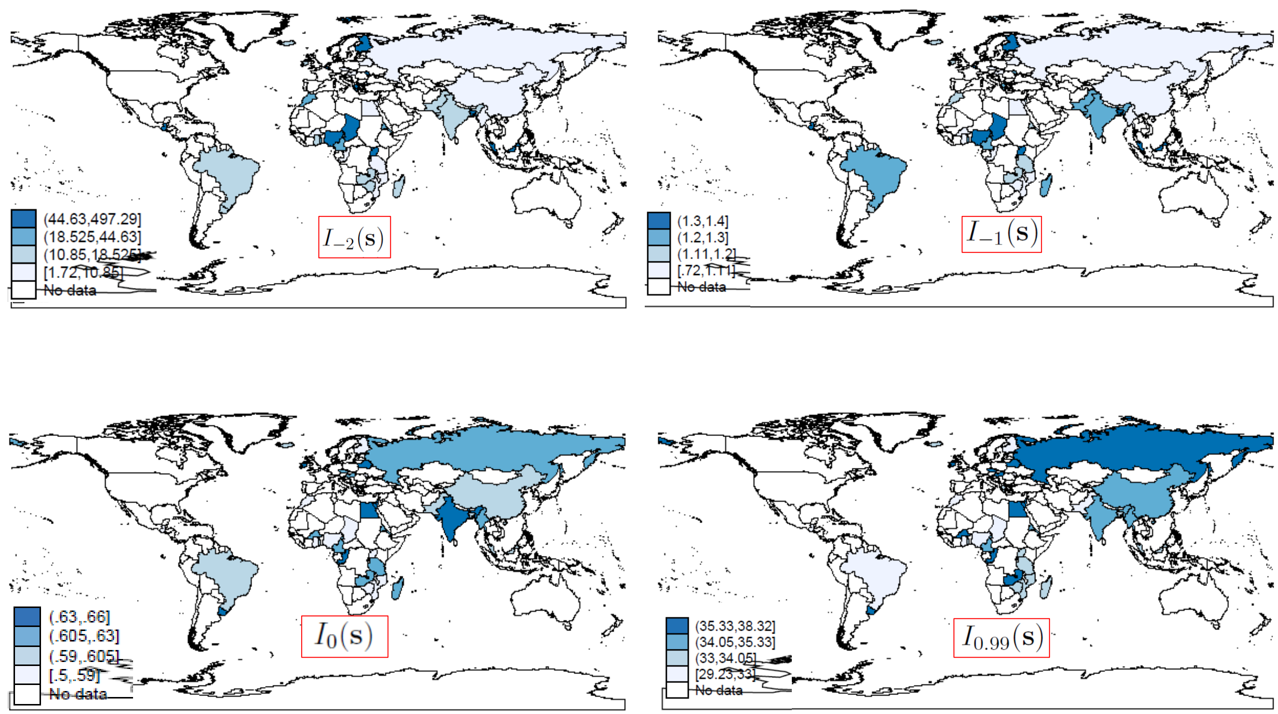

Figure 2: Sensitivity of country distribution of inequality to α: downward looking status

Hence, based on the visual and graphical evidence above, it becomes apparent that measures of status produce different inequality estimates, affecting rankings of countries. It is also true that a variation in the sensitivity parameter α produces a change in cross-country inequality rankings.

4.2 Correlation Analysis

An obvious way to check for the overall effect of different status concepts on comparisons of SAH inequality is to examine the extent to which different status concepts produce similar inequality rankings across the 70 countries in the sample. This can be done by computing correlation coefficients for inequality estimates for each possible pair of status concepts; these estimates are contingent on a particular value of the sensitivity parameter α. Table 2 provides the Spearman correlation coefficients for inequality rankings using pairwise comparisons of the four different status concepts; this is done separately for the cases $\alpha = -2, -1, 0, 0.99$. We find that for low levels of the sensitivity index ($\alpha = -2$) the upward-looking status inequality rankings $I_\alpha(\mathbf{s'})$ correlates negatively with $G_\alpha(\mathbf{s}^{\uparrow})$ but positively with $G_\alpha(\mathbf{s}^{\downarrow})$ (the Generalised Entropy inequality index using, respectively, the simple cardinalisation and the inverse cardinalisation of SAH); but there is no significant correlation of $I_\alpha(\mathbf{s'})$ with $I_\alpha(\mathbf{s})$. Consistent with this, the ranking using the downward-looking status concept $I_\alpha(\mathbf{s})$ is negatively correlated with $G_\alpha(\mathbf{s}^{\downarrow})$. The negative correlations of $\left(I_\alpha(\mathbf{s'}), G_\alpha(\mathbf{s}^{\uparrow})\right)$ and of $\left(I_\alpha(\mathbf{s}), G_\alpha(\mathbf{s}^{\downarrow})\right)$ become larger when $\alpha = -1$. By contrast, when inequality is evaluated at $\alpha = 0.99$, there is a positive correlation between each pairwise combination of inequality orderings: only in this extreme case do we find evidence of a similar pattern of inequality across countries, whatever the status concept.

In summary, we find that the correlation between the inequality indices based on different status concepts changes with the values of the sensitivity parameter; only in the extreme case where α takes large positive values do we find high correlations between pairwise inequality orderings. These findings add to previous evidence on the role of status when ranking countries in terms of univariate inequality (Costa-Font and Cowell 2016).[14]

[14] See Tables 4 and 5 in the on-line appendix.

Table 3: Determinants of inequality (categorical data), downward and upward looking status

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	$I_{-2}(\mathbf{s})$	$I_{-1}(\mathbf{s})$	$I_{0}(\mathbf{s})$	$I_{0.99}(\mathbf{s})$	$I_{-2}(\mathbf{s'})$	$I_{-1}(\mathbf{s'})$	$I_{0}(\mathbf{s'})$	$I_{0.99}(\mathbf{s'})$
	[downward-looking status]				[upward-looking status]			
median health	-26.45	-0.251***	-0.0029	0.916	1.605***	0.231***	0.0570***	0.934
	(19.47)	(0.0359)	(0.0127)	(0.658)	(0.180)	(0.0313)	(0.0140)	(0.658)
health expenditure	-8.392	-0.0067	0.00635	0.328	-0.0810	-0.00655	0.00281	0.327
	(5.933)	(0.0109)	(0.00388)	(0.200)	(0.0548)	(0.00955)	(0.00428)	(0.200)
percapita GDP	0.00185*	3.37e-06*	-1.06e-06	-7.19e-05**	-4.73e-06	-2.00e-06	-1.50e-06**	-7.22e-05**
	(0.00103)	(1.89e-06)	(6.72e-07)	(3.47e-05)	(9.49e-06)	(1.66e-06)	(7.41e-07)	(3.47e-05)
% female	8.458**	0.0178**	-0.00539*	-0.296**	-0.0722*	-0.0107	-0.00609**	-0.296**
	(4.193)	(0.00772)	(0.00274)	(0.142)	(0.0387)	(0.00675)	(0.00302)	(0.142)
% over 65	1.493	-0.0064	0.0003	0.0217	0.0402*	0.00636	0.00209	0.0225
	(2.552)	(0.00470)	(0.00167)	(0.0862)	(0.0236)	(0.00411)	(0.00184)	(0.0862)
control of corruption	11.74	-0.0077	0.00363	0.832	-0.224	0.00430	0.0218	0.842
	(26.68)	(0.0491)	(0.0174)	(0.902)	(0.246)	(0.0430)	(0.0192)	(0.902)
rule of law	-16.77	-0.0237	0.0276	0.499	0.0200	-0.0338	-0.0146	0.476
	(31.30)	(0.0576)	(0.0205)	(1.058)	(0.289)	(0.0504)	(0.0226)	(1.058)
political stability	11.32	-0.0102	-0.0055	-0.0742	0.178	0.0225	0.00393	-0.0694
	(11.56)	(0.0213)	(0.00756)	(0.391)	(0.107)	(0.0186)	(0.00833)	(0.391)
regulatory quality	-125.1***	-0.133**	0.0127	1.285	0.887***	0.119**	0.0365	1.292
	(32.18)	(0.0593)	(0.0210)	(1.088)	(0.297)	(0.0518)	(0.0232)	(1.088)
gov effectiveness	91.47**	0.165**	-0.0470**	-2.647**	-0.613*	-0.0801	-0.0440*	-2.639**
	(35.30)	(0.0650)	(0.0231)	(1.193)	(0.326)	(0.0569)	(0.0254)	(1.193)
voice & acctability	-12.87	-0.0042	0.0119	0.334	-0.108	-0.0151	0.00132	0.331
	(17.91)	(0.0330)	(0.0117)	(0.605)	(0.165)	(0.0289)	(0.0129)	(0.605)
openness	-0.433	-0.0007	0.00035	0.0321**	-0.00131	0.000593	0.000652**	0.0323**
	(0.411)	(0.000756)	(0.000268)	(0.0139)	(0.00379)	(0.000661)	(0.000296)	(0.0139)
constant	-278.4	0.924**	0.824***	43.20***	1.697	0.552	0.650***	43.16***
	(219.8)	(0.405)	(0.144)	(7.427)	(2.029)	(0.354)	(0.158)	(7.428)
R-squared	0.391	0.634	0.262	0.336	0.750	0.674	0.487	0.338

Notes. Each column gives OLS estimates for a specific instance of equation (9) using the categorical-data inequality measure I_α, one of four values of the sensitivity parameter α and either downward- or upward-looking status. For details on independent variables see Table 1. Standard errors in parentheses: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. N=69

Table 4: Determinants of inequality (cardinal data), simple and inverse cardinalisation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	$G_{-2}(\mathbf{s}^{\uparrow})$	$G_{-1}(\mathbf{s}^{\uparrow})$	$G_{0}(\mathbf{s}^{\uparrow})$	$G_{0.99}(\mathbf{s}^{\uparrow})$	$G_{-2}(\mathbf{s}^{\downarrow})$	$G_{-1}(\mathbf{s}^{\downarrow})$	$G_{0}(\mathbf{s}^{\downarrow})$	$G_{0.99}(\mathbf{s}^{\downarrow})$
	[status from simple cardinalisation]				[status from inverse cardinalisation]			
median health	0.0356***	0.0244***	0.0188***	0.0162***	-0.0191**	-0.0215***	-0.0222***	-0.0233***
	(0.00841)	(0.00544)	(0.00406)	(0.00342)	(0.00910)	(0.00718)	(0.00645)	(0.00646)
health expenditure	0.00336	0.00218	0.00158	0.00128	0.00342	0.00285	0.00260	0.00258
	(0.00256)	(0.00166)	(0.00124)	(0.00104)	(0.00277)	(0.00219)	(0.00197)	(0.00197)
percapita GDP	-6.28e-07	-4.20e-07	-3.17e-07	-2.65e-07	-5.13e-07	-2.82e-07	-1.51e-07	-6.48e-08
	(4.44e-07)	(2.87e-07)	(2.14e-07)	(1.81e-07)	(4.80e-07)	(3.79e-07)	(3.41e-07)	(3.41e-07)
% female	-0.00268	-0.00177	-0.00132	-0.00108	-0.00152	-0.000887	-0.000532	-0.000311
	(0.00181)	(0.00117)	(0.000874)	(0.000736)	(0.00196)	(0.00155)	(0.00139)	(0.00139)
% over 65	0.000490	0.000324	0.000247	0.000212	-0.000268	-0.000462	-0.000582	-0.000696
	(0.00110)	(0.000713)	(0.000532)	(0.000448)	(0.00119)	(0.000941)	(0.000846)	(0.000847)
control of corruption	-2.29e-05	0.00199	0.00286	0.00336	0.0136	0.00715	0.00330	0.000630
	(0.0115)	(0.00746)	(0.00556)	(0.00469)	(0.0125)	(0.00984)	(0.00884)	(0.00885)
rule of law	0.0202	0.0127	0.00877	0.00671	0.00777	0.0101	0.0124	0.0152
	(0.0135)	(0.00875)	(0.00653)	(0.00550)	(0.0146)	(0.0115)	(0.0104)	(0.0104)
political stability	-0.000428	9.88e-05	0.000320	0.000449	-0.00178	-0.00235	-0.00276	-0.00323
	(0.00499)	(0.00323)	(0.00241)	(0.00203)	(0.00540)	(0.00426)	(0.00383)	(0.00384)
regulatory quality	0.00912	0.00760	0.00689	0.00669	-0.00317	-0.00512	-0.00584	-0.00634
	(0.0139)	(0.00900)	(0.00671)	(0.00565)	(0.0150)	(0.0119)	(0.0107)	(0.0107)
gov effectiveness	-0.0305*	-0.0225**	-0.0183**	-0.0163**	-0.0215	-0.0147	-0.0119	-0.0112
	(0.0152)	(0.00987)	(0.00736)	(0.00620)	(0.0165)	(0.0130)	(0.0117)	(0.0117)
voice & acctability	0.00258	0.000505	-0.000426	-0.000986	0.00338	0.00335	0.00320	0.00321
	(0.00774)	(0.00501)	(0.00374)	(0.00315)	(0.00837)	(0.00661)	(0.00594)	(0.00594)
openness	4.71e-05	4.49e-05	4.19e-05	3.90e-05	0.000180	8.82e-05	2.99e-05	-1.28e-05
	(0.000177)	(0.000115)	(8.56e-05)	(7.21e-05)	(0.000192)	(0.000151)	(0.000136)	(0.000136)
constant	0.0990	0.0681	0.0526	0.0437	0.219**	0.176**	0.151**	0.140*
	(0.0949)	(0.0614)	(0.0458)	(0.0386)	(0.103)	(0.0811)	(0.0728)	(0.0729)
R-squared	0.371	0.408	0.435	0.456	0.278	0.341	0.382	0.405

Notes. Each column gives OLS estimates for a specific instance of equation (9) using the cardinal-data inequality measure G_α, one of four values of the sensitivity parameter α and either simple or inverse cardinalisation. For details on independent variables see Table 1. Standard errors in parentheses: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. N=69

4.3 Regression Analysis

Having established the empirical relevance of using different measures of status, we move on to consider the specific features that may underlie the heterogeneity of cross-country health-inequality estimates. We use regression analysis to examine the country-specific factors that appear to drive SAH-inequality and to determine whether these factors are different for four different status concepts and several values of the distributional-sensitivity parameter α.

4.3.1 Variables

The full list of the country-specific covariates is given as the list of independent variables in Table 1: the variables fall into three categories, (i) distributional aggregates (income per capita and median self-reported health), (ii) demographics (the percentage of females and the percentage of over-65s) and (iii) countries' institutional performance; this third category consists of six measures taken from the World Bank's WGI (Worldwide Governance Indicators) project, including measures of rule of law, regulatory quality, government effectiveness, voice and accountability, openness. Why would these factors be expected to be particularly important?

First, we might expect estimates of the median health and of income to throw light on the relationship – linear or nonlinear – between health or income levels and inequality. Here the relationship can be expected to depend on the status-cardinalisation adopted: for example, a change in the median in the case of the arbitrary cardinalisation (7) works in exactly the opposite direction from the cardinalisation (8); as we can see in Table 4 we get significant but opposite signs on the median-health variable. However there is no such simple link between the median and status in the case of the cetegorical-data inequality indices based on the status measures (3) and (4); this is consistent with the results for the median-health variable in Table 3. Furthermore the relationship between inequality and status could be more complex: if it were to take an inverse-U form this could be evidence of a "Kuznets curve" (Kuznets 1955) for health, a point that we consider below.

Second, one might expect health inequality to be higher where there is a higher concentration of more vulnerable people such as the elderly. Furthermore, given that age and gender are typically associated with specific health outcomes, and inequality studies typically regard those two characteristics as "unavoidable" sources of health inequality, we include two specific covariates: the percentage of women in a country, and the proportion of people over the age of 65.

Third, the WGI are the most widely-used measures of governance quality and include a number of composite governance indicators based on over 30 underlying data sources; and are designed to be suitable for cross-country comparisons. They summarise the views on the quality of governance from a large number of surveyed stakeholders in both industrialised and developing countries in 2005 which is the closest year we could find to match our data. Given that they average information from many different data sources they provided a summary measure of existing information on governance which in turn smooths out idiosyncrasies (Kaufmann et al. 2007). They are measured as an index ranging from -2.5 to 2.5, except for one indicator, "openness," which is measured in percentile rank terms. In each case higher values correspond to better outcomes. We expect WGI indicators to be important on a priori grounds given that democracy and measures of governance quality are expected to increase the influence of disadvantaged groups in social-policy decision making Kickbusch and Gleicher (2014). As Kaufmann et al. (2007) show, the WGI indicators are a robust measure of governance sensitive to changes in the representation of minorities and disadvantaged groups.

4.3.2 Regression results

Tables 3 and 4 allow us to examine the apparent role of income, overall health level, social institutions performance and country characteristics in explaining the pattern of health inequality for the four different health-status concepts examined in sections 4.1 and 4.2.

Table 3 gives the results for the inequality measures (5) for two versions of status and four different values of the sensitivity parameter α. Columns (1) to (4) of Table 3 give the results for the downward-looking ordinal health-status concept: GDP, government effectiveness and the percentage of females in the population increase health inequality when the distributional sensitivity parameter is "bottom-sensitive" ($\alpha = -2$ and $\alpha = -1$). However, in the case of GDP, these coefficients reverse sign when α is positive ("top sensitive"). There is some evidence of reduction of inequality with median health status, but this is significant only for $\alpha = -1$. Columns (5) to (8) of 3 show what happens in the case of upward-looking health status: in contrast to the downward-looking case, we now find that median health is associated with higher inequality and that government regulation is positively correlated with higher inequality. In the case of upward-looking status, government effectiveness is associated with less inequality . However, for non-negative values of α we find that female share and GDP appear to work in the same way as for downward-looking status – they are associated with lower health inequality. For both downward-looking and upward-looking status concepts, "openness" of the economy is associated with higher inequality for top-sensitive measures.

Table 4 gives the results for the conventional GE inequality measure and the two arbitrary cardinalisations used earlier. When we use the GE measure with the simple cardinalisation – in columns (1) to (4) – the most important and consistent finding is that, irrespective of α, median health is associated with higher health inequality; in the case of "inverse" cardinalisation (columns (5) to (8) of Table 4) the association (unsurprisingly) goes the other way. This finding suggests a monotonic relationship between average health and health inequality:[15] raising median health by one category increases inequality by about 2 percent. The other covariates were not statistically significant, except for government effectiveness, which is found to reduce inequality in all values of α, but only for the simple cardinalisation, not the inverse cardinalisation.

In summary, our estimates suggest that, for all the independent variables that are statistically significant, whether the underlying factor raises or lowers health inequality depends on which of the four versions of status, $\mathbf{s}$, $\mathbf{s}'$, $\mathbf{s}^{\uparrow}$ or $\mathbf{s}^{\downarrow}$, is used to compute inequality. This means that, even if we want to address apparently simple questions such as "are better-off countries associated with higher or lower SAH inequality?", we have to accept that the answer must depend on the concept of status that is used, as well as how we capture the categorical nature of SAH. Furthermore, for a given status concept, the effect often depends on the sensitivity parameter, but in different ways for different status concepts as measures of performance of a health system.

[15] In the on-line appendix we report tests of an inverted-U association between measures of health inequality GDP (Table 2) as well as a possible relationship with health expenditure (Table 3). There is no evidence of a Kuznets curve in either income or health, and no association of inequality with health expenditure

5 Conclusion

Health-inequality comparisons are inherently trickier than wealth-inequality comparisons. In the case of wealth inequality, getting better estimates is, to some extent, largely a function of getting better data; but in the case of health inequality, more is involved. Even if one has very good, carefully collected data on self-assessed health, almost always one has to deal with the fact that the data will be categorical in nature and require special treatment in order to make reliable inequality comparisons. Here we have followed a univariate, status-inequality approach that involves aggregation of individual status measures using a family of inequality measures I_α indexed by a sensitivity parameter α; the status concept takes account of the categorical nature of the data and could be downward- or upward-looking in terms of health categories. For comparison we also examined two standard arbitrary cardinalisations of health categories and again used the same principles of inequality measurement to aggregate the information about individuals. In the case of cardinal data the inequality measures become the well-known generalised-entropy indices, G_α.

So in all we have four different individual health-status concepts to which we apply essentially the same aggregation formula (I_α or G_α as appropriate) to provide estimates of inequality. We show that the status measure matters in terms of (1) ranking countries by health inequality, and (2) characterising what appear to be the principal drivers of health inequality internationally.

(1) When we deal with categorical data on SAH using I_α we find that, for low values of the sensitivity parameter α (where the index is most sensitive to the bottom of the distribution) status does matter; there is no, or even negative, correlation between upward and downward-looking versions of status. In contrast, for zero or positive values of α the association becomes positive and large. When we adopt one the standard arbitrary cardinalisation of the categories (the "1-to-5" version) as a measure of status we find that for negative values of α there is a negative correlation between upward-looking status (ordinal) I_α and G_α; this flips and becomes positive for $\alpha \geq 0$. We find a similar story if we use the inverse 5-to-1 cardinalisation for health status; the negative correlation between I_α and (cardinal) G_α that is observed for $\alpha < 0$ becomes positive for high values of the sensitivity parameter α.

(2) The message from the regression analysis is particularly striking. If we were to model health status using the standard cardinalisation – numbering the health categories 1-to-5 or 5-to-1 – the overwhelming driver of health

inequality is the median level of health, which is associated positively with health inequality; almost nothing else is statistically significant. But if we use an appropriate method for modelling health status then, as seems reasonable, GDP, the composition of the population and governance quality are revealed to be important drivers of inequality.

There are important policy implications. First, our findings suggest that government attempts to reduce "pure" or "univariate" health inequality need to pay specific attention to the nature of the data; they also need to specify the relevant sensitivity to inequality in different parts of the distribution (the parameter α) they wish to rely on in accordance with the values of a specific society. Second, we find evidence of heterogeneity in the determinants of inequality across different types of health-status measure; so it is important for policy makers to have a clear argument for the type of status measure they consider appropriate. Finally, our results show that health inequality varies with some measures of institutional performance (such as government effectiveness), suggesting the need to examine further the effect of institutional design on inequality.

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