

Research letters

World Health Report 2000: inequality index and socioeconomic inequalities in mortality

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Monitoring of inequality in health has become an increasingly important task of development agencies. We compared the inequality index as published in the World Health Report 2000 with available evidence on socioeconomic inequalities in mortality in 15 industrialised and 43 less-developed countries. We found that the World Health Report index does not correspond with international variations in the size of socioeconomic inequalities in mortality. These findings indicate that the index should not be interpreted as a reflection of socioeconomic inequalities in health, nor should the index be used to replace the indices developed to monitor socioeconomic inequalities in health.

In the World Health Report 2000,¹ the WHO published for the first time a ranking of 191 countries according to child mortality distribution within a population. The aim of this index is to measure all inequality in mortality across populations, without any preconceptions about the dimensions along which mortality is unequally distributed. Doing so, the index departs from established research that focuses on mortality differences between socioeconomic groups. Nonetheless, many readers of the report might be inclined to interpret its index in terms of socioeconomic

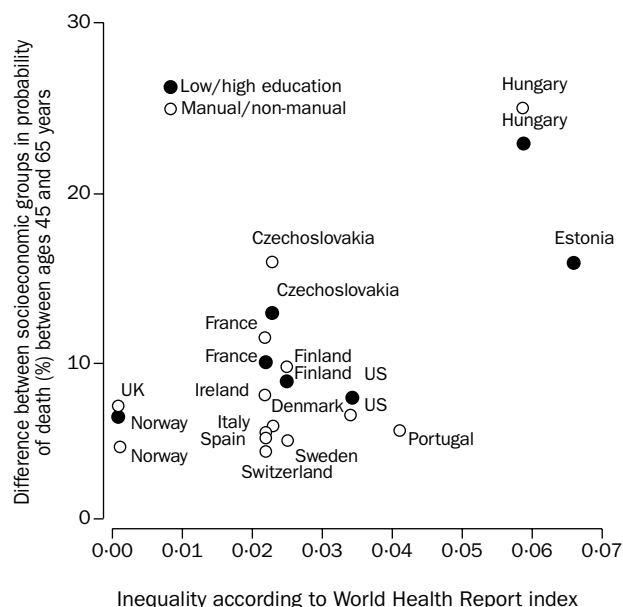
inequalities in mortality. We question the extent to which there is an empirical association between the World Health Report 2000 inequality index and available estimates on socioeconomic inequalities in mortality.

The objective of our analysis was to find the extent to which international variations in the size of inequality in mortality according to the report's index agree with international variations in the size of inequality according to well-established measures of socioeconomic inequalities in mortality. We compared the World Health Report index with: (1) measures of socioeconomic inequalities in premature mortality that are available for 15 high-income countries; and (2) measures of socioeconomic inequalities in under-5 mortality that are available for 43 low and middle income countries.

For a description of the World Health Report index, readers are referred to the actual report and one by E Gakidou and G King.² The main estimates of socioeconomic mortality differences that are available in a comparable way for several high-income countries are those concerning occupational (manual *vs* non-manual) and educational (low *vs* high) differences in mortality among men of 45-64 years of age.³ These data are available for 15 countries, and are regarded as a key indicator of inequalities in mortality in industrialised countries. For less-developed countries, estimates are available for differences between rich and poor in under-5 mortality.⁴ This measure could be estimated in a comparable way for the 43 countries covered by the Demographic and Health Survey's II and III. Households were grouped into wealth quintiles based on an asset index developed by the World Bank.⁴

We used the absolute values, instead of country ranks, of the World Health Report's index. To compare with other indices, we recalculated the report's index values by subtracting them from 1, so that small numbers would indicate low inequality (with 0 indicating complete equality) and large numbers would indicate high inequality (with 1 indicating extreme inequality). In the World Health Report index, no preference is given to either a relative or an absolute approach. Therefore, we compared the recalculated index to both relative and absolute measures of socioeconomic inequality in mortality.

We found some correspondence among industrialised countries between the World Health Report index and both relative and absolute measures of socioeconomic inequality in mortality (figure, table). However, closer examination of the data shows that this correspondence is based on two outliers (Hungary and Estonia). When these two countries are excluded from analysis, the association disappears. France, for example, has small inequalities according to the World Health Report index, whereas socioeconomic differences are substantial as compared with the rest of western Europe. The two countries that are close to perfect equality according to the World Health Report index, UK and Norway, still experience considerable socioeconomic inequalities in mortality.



Pearson's correlation coefficients

	Occupational measure		Educational measure	
	Absolute	Relative	Absolute	Relative
Including all countries	0.60 (p=0.022)	0.62 (p=0.018)	0.80 (p=0.032)	0.62 (p=0.135)
Excluding Hungary and Estonia	0.06 (p=0.843)	-0.02 (p=0.950)	Too few countries	

Inequality in industrialised countries according to World Health Report index versus absolute socioeconomic inequalities in mortality

Indicators	Pearson's correlations with inequality measure			
	World Health Report index		Absolute poor-rich differences	
	No control	Control for overall under-5 mortality rate	No control	Control for overall under-5 mortality rate
Under-5 mortality rate†	0.78†	–	0.45†	..
Fertility rate§	0.64†	–0.02	0.23	–0.29
Female literacy rate§	–0.63†	–0.10	–0.29	0.09
GDP per capita§	–0.64†	–0.22	–0.16	0.25
Public expenditure on health as % of GDP§	0.14	–0.18	–0.27	–0.49†
Overall care delivery rate†	–0.50†	–0.15	–0.11	0.17
Absolute poor-rich inequality in delivery care†	0.11	0.03	0.37*	0.36*
Overall immunisation rate†	–0.38*	–0.10	–0.18	0.01
Absolute poor-rich inequality in immunisation rate†	0.52†	0.32	0.59†	0.48†

* $p < 0.05$; † $p < 0.01$. Sources: ‡Gwatkin E, King G §Human Development Report (1998), www.undp.org/hdro/indicators.html

Correlation of World-Health Report index and poor-rich inequalities with development indicators: 38 low and middle income countries

There are many explanations for the large discrepancies between the two indices. In industrialised countries, inequalities in child mortality commonly show patterns that are distinct from the more important inequalities seen at higher ages. A higher degree of correspondence might be expected in the analysis of less-developed countries, for which both indices refer to the same age range and use the same data source. However, for these countries no consistent link is seen between the World Health Report index and measures of socioeconomic differences in under-5 mortality. The World Health Report index correlates negatively with relative inequalities in mortality. The correlation with the poor-rich mortality rate ratio was -0.41 ($p=0.006$). However, the correlation with an absolute measure, the poor-rich difference in mortality, was positive and equally strong ($r=0.44$; $p=0.003$).

The correspondence between the World Health Report index and absolute poor-rich differences in mortality is examined in the table. If both measures roughly correspond, do they also exhibit similar links with development indicators? Correlation analysis was done for 38 countries for which data on all development indicators were available. According to the table, the report's index mainly reflects the overall under-5 mortality rate. This result might provide an explanation for the fact that the correlation between the report's index and poor-rich differences in mortality is in opposite directions for relative and absolute measures. Absolute poor-rich mortality differences are sensitive for overall mortality levels, whereas relative mortality differences are not.

The World Health Report index also correlates with a few other variables, such as gross domestic product (GDP) per capita and female literacy rate, but these correlations disappear when we control for under-5 mortality. By contrast, absolute poor-rich differences in mortality are not only correlated with the overall level of mortality; after control for this level, associations persist with inequality in immunisation, inequality in the delivery of care, and public expenditure on health as a percentage of GDP. The results for relative poor-rich differences show the same tendencies. All these correlates are indicators of the degree to which health care is made available and accessible to the poor.

Evidence on socioeconomic differences in premature mortality has become available for more countries from all parts of the world. Monitoring these differences, both over time and between countries, gives support to policies that aim to improve the health of disadvantaged people. Unfortunately, despite its emphasis on inequalities in health, the World Health Report 2000 has not seized the opportunity to combine and disseminate this information for as many countries as possible. The new index that was included bears little relationship to socioeconomic

inequalities in mortality. Even though we would like to remain open for the potential values of this new index, we do share the fear of others⁵ that its applicability for monitoring and tackling inequalities in health may turn out to be very limited. We therefore strongly recommend that the World Health Report returns to the use of indices directly measuring the gap between the poor and the rich.

- 1 WHO. The World Health Report 2000. Geneva: WHO, 2000.
- 2 Gakidou E, King G. An individual-level approach to health inequality: child survival in 50 countries. GPE Discussion Paper Series: Number 18. Geneva: World Health Organization, 2000.
- 3 Kunst AE. Cross-national comparisons of socio-economic differences in mortality (thesis). Rotterdam: Erasmus University Rotterdam, 1997.
- 4 Gwatkin DR, Rutstein S, Johnson K, et al. Socio-economic Differences in Health, Nutrition, and Population. Washington, The World Bank, 2000.
- 5 Braveman P, Krieger N, Lynch J. Health inequalities and social inequalities in health. *Bull World Health Organ* 2000; **78**: 232–34.

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Use of pentoxifylline in membranous nephropathy

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Urinary TNF- α excretion correlates with proteinuria in patients with membranous nephropathy (MGN). Pentoxifylline suppresses or reduces the production of TNF- α . Between April, 1999 and August, 2000, we did a single-centre, prospective, pilot study to assess the effects of pentoxifylline (1200 mg/day) on proteinuria in patients with idiopathic MGN. Ten patients were included and treated for 6 months. Pentoxifylline significantly decreased proteinuria from 11 g/day [range 4.6–27] to 1.8 (0–10.9); $p=0.001$. Pentoxifylline may be a safe and effective adjunct to steroids and immunosuppressants in patients with MGN.

MGN is an immune-mediated glomerular disease in which antibodies against unknown antigens produce immune complexes, with subsequent activation of the complement cascade. This process results in increased production of TNF- α in the glomeruli,¹ which is reflected by altered urinary excretion of this cytokine.² Urinary TNF- α excretion has been shown to correlate with proteinuria in patients with MGN.² In-vitro and in-vivo studies have shown that pentoxifylline suppresses or reduces the