Letters to the Editor

Is the use of self-rated health measures to assess health inequalities misleading?
From SV SUBRAMANIAN* and KAREN ERTEL

In three studies published in IJE,1–3 authors examined whether the association between self-rated health (SRH) and mortality varied by socioeconomic status (SES). They then used the empirical results to comment on the potential discordance in the magnitude of social inequalities in health when estimated using SRH as opposed to mortality. The three studies, however, arrived at different conclusions about the potential misestimation of health inequalities when using SRH instead of mortality. Huisman and colleagues concluded that a weak interaction between SRH and education whilst predicting mortality is unlikely to result in over-estimation of educational differences in health status.1 Meanwhile, Singh-Manoux and colleagues concluded that use of SRH might under-estimate health inequalities by income and occupation.3 Dowd and colleagues reported that ‘self-rated health does not predict mortality as well at lower levels of SES’, but do not speculate on whether this will result in over- or under-estimation of social inequalities in health.2

Testing whether the association between SRH and mortality varies by SES can at best provide indirect clues as to whether the use of SRH (instead of mortality) over- or under-estimates health inequalities. Furthermore, interpretations of interactions in generalized linear models are not straightforward. It is, therefore, surprising that the authors did not directly test whether social inequalities in health are misestimated with the use of SRH. Instead, they tested whether the SRH-mortality association varied by SES. While interesting in itself, such an approach to ascertaining the magnitude of social inequalities of health is circuitous and potentially misleading. At least in the EPESE dataset, when we tested for this directly, there is no evidence that we are over- or under-estimating social inequalities of health.

Using the Established Populations for the Epidemiologic Study of the Elderly (EPESE) dataset—the same dataset used by Idler and colleagues in their classic study showing that SRH predicts mortality7—we conducted a direct test of the difference in social inequalities in health when predicting SRH compared with mortality. We used education and income collected in 1982 to predict poor SRH in 1994 and mortality before 1994 in the New Haven EPESE study population. The mean (SD) age of subjects in 1982 was 74.2 (6.8). As shown in the Table 1, compared with those with a college degree or more, the odds ratio (OR) for reporting fair/poor/bad health for those with less than a high school education was 2.28 (95% CI 1.22–4.25); the corresponding OR for mortality was 2.04 (95% CI 1.41–2.94). Concordance in the ORs was observed across other educational categories as well as by income (Table 1). We also tested for the presence of an interaction between SRH and each indicator of SES (education and income) when predicting mortality. In our sample, we did not find any evidence for these interactions (results available upon request).

We think it is important for readers to note that in the recent articles that appeared in IJE,1–3 the authors did not directly test whether social inequalities in health are misestimated with the use of SRH. Instead, they tested whether the SRH-mortality association varied by SES. While interesting in itself, such an approach to ascertaining the magnitude of social inequalities of health is circuitous and potentially misleading. At least in the EPESE dataset, when we tested for this directly, there is no evidence that we are over- or under-estimating social inequalities of health by using SRH, a subjective measure, as opposed to the ‘objective’ measure of mortality. It would be interesting to know the results of similar direct assessments in the datasets used in the IJE studies1–3 and whether substantive conclusions would be altered.

References
5 Idler EL, Kasl SV, Lemke JH. Self-evaluated health and mortality among the elderly in New Haven, Connecticut,
Author’s Response
From MARTIJN HUISMAN,1* FRANK VAN LENTHE2 and JOHAN P MACKENBACH2

We find Subramanian and Ertel’s reaction1 highly stimulating. They state that the approach that we took in our study2 is indirect and express surprise that we did not test directly whether social inequalities in health are misestimated when using SRH, by comparing the magnitude of social inequalities in SRH with that of inequalities in mortality.

The terms ‘direct’ and ‘indirect’ that are used by Subramanian and Ertel to denote the different approaches may not be appropriate because both approaches provide answers to different questions. The point of departure of our own analyses was the simple fact that we do not exactly know what SRH means. As we indicated in our paper there may be good reasons to assume that people from different socioeconomic groups judge their SRH on different grounds. This is an intriguing possibility that deserves further analysis. If it would be true, comparisons of SRH between individuals from different socioeconomic groups would not be immediately meaningful. However, we did not find substantial differences in the association of SRH with mortality between socioeconomic groups.

The ecological approach of Subramanian and Ertel answers the question whether the magnitude of socioeconomic inequalities in SRH reflects inequalities in mortality within the population. This is a different type of question. It needs to be recognized that in case of similar inequalities, different socioeconomic groups may still have judged their SRH on different grounds.

To answer the question, however, we have now performed analyses in accordance with this approach on our dataset. Results are presented in Table 1.

One problem with this approach is the choice of the appropriate cut-off. When comparing SRH inequalities with mortality inequalities in our data with the SRH cut-off at ‘fair/poor’, we would need to conclude that health inequalities were larger when measured with SRH (SRH odds ratio 3.48; mortality odds ratio 2.31, but with overlapping confidence intervals), but this conclusion would not be warranted when the SRH cut-off is taken at ‘good/fair/poor’. We also observed a more regular gradient for SRH than for mortality. On the whole, these results do not provide clear evidence for or against the ‘validity’ of SRH inequality.

---

1 Interdisciplinary Center for Psychiatric Epidemiology, University Medical Center Groningen, University of Groningen, 9700 RB Groningen, The Netherlands.
2 Department of Public Health, Erasmus MC, University Medical Center Rotterdam, Rotterdam, The Netherlands.
* Corresponding author. Interdisciplinary Center for Psychiatric Epidemiology, University Medical Center Groningen, University of Groningen, PO Box 30001, 9700 RB Groningen, The Netherlands.
E-mail: Martijn.Huisman@med.umcg.nl

---

Table 1 OR and 95% CI associated with educational and income levels

<table>
<thead>
<tr>
<th>Education</th>
<th>Outcome: Self-rated fair/poor/bad health in 1994 OR (95% CI)</th>
<th>Outcome: mortality before 1994 OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than high school</td>
<td>2.28 (1.22–4.25)</td>
<td>2.04 (1.41–2.94)</td>
</tr>
<tr>
<td>High school</td>
<td>1.61 (0.82–3.14)</td>
<td>1.87 (1.25–2.81)</td>
</tr>
<tr>
<td>Some college</td>
<td>1.84 (0.85–4.02)</td>
<td>1.86 (1.15–2.99)</td>
</tr>
<tr>
<td>College degree or more</td>
<td>1.00</td>
<td>1.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Income</th>
<th>Outcome: Self-rated fair/poor/bad health in 1994 OR (95% CI)</th>
<th>Outcome: mortality before 1994 OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;$5000</td>
<td>1.31 (0.82–2.10)</td>
<td>1.40 (1.05–1.85)</td>
</tr>
<tr>
<td>$5000–6999</td>
<td>1.49 (0.91–2.45)</td>
<td>1.50 (1.12–2.01)</td>
</tr>
<tr>
<td>$7000–9999</td>
<td>1.25 (0.75–2.08)</td>
<td>1.65 (1.23–2.21)</td>
</tr>
<tr>
<td>$10000</td>
<td>1.00</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Models adjusted for age, sex, race, household size and marital status at baseline (1982).


doi:10.1093/ije/dyn205
Advance Access publication 23 September 2008