Reviewer's report

Title: Using mortality follow-up of surveys to estimate social inequalities in Healthy Life Years

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Reviewer: Henrik Bronnum-Hansen

Reviewer's report:

The study has several purposes. First it evaluates the feasibility of using mortality data established by follow-up of two Belgian surveys (HIS and SILC) to construct life tables by educational level. Second it uses these life tables to estimate healthy life years (HLY) by educational level based on health data in the two surveys. Finally, the study compares HLY results from the two surveys and life expectancy (LE) at age 25 estimated by the mortality follow-up of the surveys with that established from census data.

The importance of the study is that population mortality data categorized according to socio-economic (SES) groups, for instance defined by education, is not generally available in most (European) countries. The authors describe the golden standard as that “extracted from databases linking national census data with mortality records from a National Register using a unique identifier” (p 4-5). In fact, in some (Nordic) countries it is possible to calculate socio-economic specific death rates by linkage between nationwide registers (e.g. Bronnum-Hansen H, Baadsgaard M. Widening social inequality in life expectancy in Denmark. A register-based study on social composition and mortality trends for the Danish population. BMC Public Health 2012; 12:994).

Major Compulsory Revisions:

1. In the Methods, Data section, page 5, the mortality follow-up is described and it is stated that “The linkage was successful for 97% of the HIS records and for 96% of the SILC records”. The reader needs to know the percentage of participation to get an idea of the bias introduced by not having linkage to persons who did not participate (and who probably to some extent are characterized by lower educational level, poorer health and higher death risk etc.)

2. On page 7, Analysis section: Three criteria for assessing the feasibility of using mortality of a survey to estimate social inequalities in HLY are stated. But these criteria are not very specific. For instance, the criteria for assessing the feasibility with respect to LE estimates is “the differences between LE estimates using Belgian census and those estimated based on the surveys must not be substantial”. What is substantial in this respect?

3. In the result section and Table 3 mortality rates based on follow-up of HIS and SILC for different educational groups are presented. Does the HIS and SILC
estimates differ statistically significantly? A test is needed.

4. Because the criteria described on page 7 are weak it is difficult to accept the statement (on page 8) “In both surveys, the HLY estimations are precise enough as shown by acceptable width of the confidence intervals”. What would be acceptable if you want to monitor HLY trends in educational inequalities? The width of CI depends on the size of the survey and length of follow-up.

5. In my opinion the results in the last paragraph of the result section is the most important (methodological) part of the study. In fact it refers directly to the title of the paper. Why is this important part of the study understated? I disagree with the statement that a discrepancy of more than 3 years in LE at age 25 is not substantial. Furthermore, confidence intervals of the figures in table 5 should be added. And the figures ought to be presented with the same precision: 1 or 2 decimals for all figures.

6. As I indicated, I do not at first agree with the conclusion, that “This study suggests that it is feasible to use the mortality follow-up of surveys to estimate social inequalities in mortality...” Would it be possible to assess the effect of (differential) non-response to explain the (in my opinion) large differences in LE for some educational groups between the two surveys and the census? Furthermore, I suggest a discussion of how the different definition of educational level in the two surveys might explain the LE differences.

7. Because the relevance of the study is related to the choice of HLY as a structural indicator in the European Union you may want to comment on whether SILC data is useful for international comparisons of HLY by educational level or whether the conclusion might be that the differences between the national SILC surveys are too large.

Minor Essential Revisions:

8. Abstract, Results: Change “statically” to “statistically”.

9. On page 5 some readers might be confused by the terminology when differentiating between “census survey” and other “surveys”.

10. Table 4: Correct the sign of figures of HLY differences.


Discretionary Revisions:

12. Does the reference list include all relevant literature?

**Level of interest:** An article of importance in its field

**Quality of written English:** Acceptable
Statistical review: Yes, and I have assessed the statistics in my report.

Declaration of competing interests:
I declare that I have no competing interests