Reviewer’s report

Title: Contribution of main causes of death to social inequalities in mortality in the whole population of Scania, Sweden

Version: 2 Date: 9 January 2006

Reviewer: Jean Adams

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General
This article describes an analysis of the relative contributions of socio-economic variations in different causes to overall socio-economic inequalities in mortality. The authors conclude that cardiovascular diseases make the largest contribution to socio-economic inequalities in mortality in the population studied. Although this reflects a number of previous findings, the authors claim the study is novel because of the population sample and presentation of results according to age and sex specific groups. Overall the analysis appears sound. However, the English is poor in places leading to potential misinterpretation and confusion. The methods could be clearer and further discussion of a number of issues raised would be helpful.

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Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)

1. Abstract line 25-6 (and elsewhere), “As expected, diseases with well established mechanistic links with SEP made major contributions to the mortality differences seen.” This sentence appears to suggest that establishing a causal pathway between SEP and any particular disease leads to that disease making a greater contribution to socio-economic inequalities in mortality. I’m not sure why it would be expected that things that are better understood make a greater contribution to socio-economic inequalities in mortality. Cardiovascular disease (and the socio-economic patterning of it) is primarily well understood because it is a major public health issue – not because it is socio-economically patterned.

2. Introduction line 2-3, “associations between social inequality and health inequality”. I’m not absolutely convinced there is a relationship between social inequality and health inequality. There is a relationship between social status and health, and a relationship between social inequality and health – but between social inequality and health inequality? Furthermore, health inequality is a pretty non-specific term – it needs to be qualified in terms of what has been compared in order to find inequality – gender, age, race, socio-economic position etc.

3. Introduction line 2-6, “associations between social inequality and health inequality are contingent on mechanistic links between social position and major risk factors for different causes of death. As such the strength and patterning of social inequality in mortality will differ across age, causes and over place and time”. It is not clear to me how the second sentence necessarily follows from the first. It would seem to me that variations in socio-economic inequalities in mortality according to the variables listed are, at the least, dependent on variations in risk factors according to the same variables. I think this would need to be added to make the logical progression that is implied. Of course, there are other reasons why socio-economic inequalities in mortality are not consistent across populations – including variations in the effect of and response to risk factors.

4. Introduction line 6-8, “to most efficiently reduce social inequalities in mortality, it is important to establish which causes of death contribute most to socioeconomic mortality differentials.” Again, this doesn’t seem to me to be necessarily true. I suspect the one most effect way to reduce socio-economic inequalities in mortality would be to eliminate the socio-economic spectrum.

5. Introduction line 8-9, “Earlier studies have investigated patterns of the main causes of death to socioeconomic inequalities in mortality.” A summary of the findings of this previous work would be
helpful.

6. Introduction line 15 “the contribution of specific causes of death”. In the previous paragraph, previous work which investigated the contributions of “the main causes of death” to socio-economic inequalities is criticized for failing to focus on “diseases”. However, this sentence appears to suggest that the present work will also focus on “causes of death” and not diseases. I think there should be some clarification of terminology here. What exactly is meant by the two different terms?

7. Methods line 17-23, “The data on occupation...” My understanding is that occupations were assigned based on current situation in 1991 with those less than 20 being assigned an occupation according to their household and those over 65 being assigned an occupation according to their occupation at retirement. There appears to be significant lack of comparability between these measures – careers are just beginning at age 20 and may not be a good indication of what will unfold by age 65. Similarly, inclusion in the workforce was measured only once – many people will move in and out of the workforce through their lives – particularly students and mothers who return to work after a period of staying at home with children. Given the rich data source that is available, I would think it would be useful to look at either a more comparable measure of occupation – the occupation held at age 20 in everyone, for example – or attempt to measure socio-economic position using a more longitudinal approach – using data from more than one point in time. If neither of these things can be done, this limitation needs to be mentioned in the discussion.

8. Methods line 46-53, “The study population was followed with regard to all-cause mortality, major groups of causes of death....specific causes of death....underlying causes of death....” As mentioned above, I think it would be helpful to clarify what these different terms mean. Specifically, what are ‘underlying causes of death’, how are these measured, how do they differ form ‘specific causes of death’, and can there be more than one ‘underlying cause of death’? Perhaps it would be useful to include information on what data is captured in a Swedish death recording form in order to clarify this area more.

9. Discussion line 2-3, “CVD and cancer made the largest contributions to these mortality rates.” Given that it is specified in the introduction that this will be an age-group specific analysis, I think this summary statement must include a statement of what age-groups it refers to. CVD and cancer did not make the largest contributions to socio-economic inequalities in mortality in all age-groups, although they did overall.

10. Discussion p16, “mortality rates among those outside the workforce was compared with mortality rates among those inside the workforce, and this group included the relatively large group of manual workers...” Presumably it would be possible to re-run the analysis including all three groups (outside, manual and non-manual) comparing those outside the workforce to those in non-manual occupations to look at the full social spectrum. This might be a useful third analysis that would eliminate this limitation.

11. Although the authors seems to be happy with the coverage of death data, they do not mention accuracy. There is data from the UK suggesting that causes of death on death certificates are only around 50% accurate (Clarke A, Gladwin J, Rooney C, Carter S, N Fulop. “Dead easy? An analysis of the production of death certificates and suggestions for change.” Journal of Epidemiology & Community Health 2002;56(SSM supplement):A5) Further discussion of this issue would be useful.

12. Discussion. Other issues not covered in the discussion that would improve the paper include: potential reasons why cardiovascular diseases make the largest contribution to socio-economic inequalities in mortality; potential reasons why the relative contributions of different causes of mortality to socio-economic inequalities vary over the life-course; potential intervention strategies that are suggested by these results (the authors propose that generating these is a key justification for the study); comparison of results to the 10 similar analyses cited in the introduction.

Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

13. Abstract line 17 (and elsewhere), “differences seen between manuals and non-manuals”. I think it would be more appropriate to refer to individuals with manual and non-manual occupations.

14. Results p11, “Those outside the workforce showed markedly higher relative inequalities”. How can a single group show inequalities? Do the authors mean relatively mortality rates?
15. Discussion p15, “The smaller contribution of cancer in older ages has been argues to be referred...” I’m not quite sure what this sentence means – I think it would benefit from a re-write to clarify meaning.

16. Discussion p16, “Thus, the social inequalities by workforce participation seem to be associated with greater health problem than the social inequalities seen among those inside the workforce.” The authors seem to be confusing the terms “inequalities” and “mortality”. Inequalities in mortality are greater according to workforce participation than according to occupational type; there is no data on the social circumstances of any group (in terms of social standing or income) so social inequalities seen among those inside the workforce can not be commented on.

17. Discussion p16, “Even though there was a pronounced role for CVD, contributing to the mortality differences, the role of other specific causes besides cardiovascular, cancer, external causes or psychiatric disease were relatively greater”. From my reading of Table 6, this was only true in some age groups. For example, the contribution of CVD overall in all men <70 was 44.7%, compared to 24.9% for other causes.

18. Discussion p17, “…the female negative contribution of cancer…” This phrase is confusing and needs to be rewritten to improve clarity.

19. Discussion p18 “Misclassification of end-point is a potential causes of bias…”

Discretionary Revisions (which the author can choose to ignore)

20 Figure 1 – this includes just the population in the workforce. This is not the full population studied and it is not clear why this sub-group is chosen for inclusion in this figure. I think it would be better either to include similar figures for manual, non-manual, in work, and out of work populations, or to just have one figure describing the full population.

21 Results p12, “With the exception for cancer mortality in the ages 31-50 years, women generally showed lower mortality rates than men...” Given that gender differences in overall mortality are not a key aspect of this paper, I think the enumeration of these could be excluded.

What next?: Unable to decide on acceptance or rejection until the authors have responded to the major compulsory revisions

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Needs some language corrections before being published

Statistical review: No

Declaration of competing interests:

I declare I have no competing interests.