Reviewer’s report

Title: Education-based health inequalities in 18,000 Norwegian couples: The Nord-Trondelag Health Study

Version: 4 Date: 7 September 2012

Reviewer: Anton Carl Jonas Lager

Reviewer’s report:

Dear Editor and Authors,

Although the paper has been carefully revised, there are still some loose ends concerning the issues that I commented on the last time:

1. What “has not been resolved” in relation to “the health impact of the partner’s socioeconomic position”? And in what way does this study move things forward in this field? According to previous literature, are we not expecting the partner’s socioeconomic position to be correlated with the first person’s health, and isn’t this exactly what also this study suggests? (Note also that “health impact” seems to suggest causality – something that cannot be approached in the data).

2. Although the “social context”-motive for studying partners has been toned down in this version, there is still something hinted here that I don’t think is called for. The concept of “social context” to me suggests that we must assume a more complicated picture (in one way or another) than the one that can be captured by simply studying the exposures that each individual is exposed to. In this study, one of the exposures is the partner’s education. As long as this exposure does not mean different things in different couples, I think the use of “social context” confuses more than it clarifies.

(3. My old comment here was a replication of comment 1, my bad.)

4. Thanks for showing the models with adjustment for partners’ education.

5. It is stated that “As shown in Figure 1, we used cubic splines to assess the associations between education and the health outcomes” but as I understand it; you ONLY use cubic splines for this figure, which is only there to give a description of the data, and not in the main analyses, right? Then this information could with benefit be moved, e.g. to the figure legend, or at least moved from the very beginning of the “Statistics” section.

6. The problem with comparing the effect of education within and between couples that I pointed to last time has not been resolved. You state in the abstract that “A one-year increase in education relative to that of one’s partner was associated with an improvement of 0.6 scale points (95% confidence interval 0.5 to 0.8) in the subjective health score (within-couple coefficient). A one-year increase in a couple’s average education was associated with an improvement of
1.7 scale points (95% confidence interval 1.6 to 1.8) in the subjective health score (between-couple coefficient)” and consequently that “Education-based inequalities in health were more pronounced between than within couples”. But this is still an unfair comparison. What you seem to have shown is that 1 year of education for 1 person explains less variation in health than for example 1 year of education for 2 persons, or 2 years of education for 1 person (that is, in both cases, an average increase of 1 year in the couple’s average education). Isn’t this stating the obvious?

Further, and probably more importantly, if you control for “couple average education” – it does not seem surprising that individual education becomes relatively unimportant (both to own education in model 1-2 and to “between couple” education in model 3) – given that most of the individual’s education in model 3 is subsumed by the couple’s average.

7. My comment on over/underestimating the effect of education has been dealt with.

Finally, I wonder if there is a specific reason for the interest in “within couple inequalities”: are you expecting some kind of relative, rather than absolute, “effects” due to e.g. social comparison between the spouses, and if so, could you expand on this? If not, is it necessary to refer to “inequalities”?

To sum up, I still think it is an interesting paper but one that in its present form, I am afraid, risks stirring up more confusion than it resolves. I consider comment 6 to be a “Major Compulsory Revision” and the rest "Minor Essential Revisions". There are also typos that need to be dealt with.

Good luck with the final work with this study.

Best regards,
Anton Lager

**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