Reviewer's report

Title: Impact of social ties on self reported health in France: Is everyone affected equally?

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Reviewer: Amanda Nicholson

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This paper addresses an interesting and important research question: does the impact of social ties on self-rated health (SRH) vary by income. Examining the variation in response to social exposures is an important part of understanding social influences on health. However the paper does not adequately answer the question it set. In order to study potential effect-modification by income, stratified results should be presented in addition to interaction tests. There seems to be some confusion about the meaning of odds ratios in the models with interactions.

Major compulsory revisions

1. Statistical Methods: Why was ordered logistic regression used for the analyses? Self-rated health is most commonly used as a dichotomous dependent variable in logistic regression. The phrase odds ratio reflect the association between the level of SRH and explanatory variables does not make it clear what is being reported in Table 3. In ordered logistic regression the coefficient reported is constrained to be the same for all possible cut-points of the SRH scale eg 1 vs 2-6, 1-2 vs 3-6, 1-5 vs 6. This may not be appropriate for SRH. Has the assumption of parallel regression been tested?

2. The relationship between social ties and SRH may differ between men and women. Were the analyses run separately in sexes and compared before being combined?

3. Inadequate control for confounding

The relationship between social ties and health may be confounded by marital status (which may or may not be considered as social tie) and health behaviours. These variables should be included in models if they are available. Reverse causality (ie does poor health limit social contact) could be assessed by including some other measures of health in the models eg number of visits to doctors.

4. Testing effect modification

The results of stratified analyses are needed to show how the relationship between social tie and SRH varies by income level. Models with interaction terms is often used to assess how adding interaction term to the model improves model fit, assessed by likelihood ratio tests.
5. Results: Table 2: the numbers in each cell would give the reader a better idea of the data structure and reliability of results. Confidence interval for ratios should be given here and in Table 3.

6. Odds ratios in models with interaction terms

Interpretation of odds ratios in models with interaction term is complex and some would advise against reporting them. It is not accurate to refer to interaction terms reducing the odds ratio for social ties. The odds ratio for the social tie item in the model with interactions included appears to be for those in the reference group eg high income. The odds ratio for participants in other income groups are obtained by multiplying by this odds ratio by the appropriate interaction term.

7. Discussion A fuller discussion of the nature of the outcome (SRH) is required. Although it is consistently related to mortality (see Idler & Benyamin), it is a subjective assessment. Reporting tendency may affect assessment of both health and social ties (especially eg such as having no friends or feeling alone which may be a feature of depression).

Minor essential revisions

1. Abstract
The first 2 sentence of the results are not relevant to the aim.

2. Self-rated health.
The precise wording of the 6 point Likert scale would be helpful in the text as well as Table 2. The definition of poor health used is unusual in that it includes the 4 of the 6 categories. This should be justified in the text.

3. Social ties questions: What was the rationale behind the selection of the 5 questions used? It would be helpful to have a discussion of which were considered structural and which cognitive measures of social networks. As the authors discuss, living alone measures marital status more than social ties. The paper would be clearer if the authors gave definitions of what they were considering as social ties, as this affects to some degree what should be considered as confounders

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: 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.