Reviewer’s report

Title: Impact of Family Average Income on Stroke Prevalence among Urban and Rural Residents in Regional Mainland China

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Reviewer: Virasakdi Chongsuvivatwong

Reviewer’s report:

General

The paper presented interesting findings in China where stroke is a major public health problem. It showed the prevalence risk differential concluding that family with higher average income is at higher risk for stroke.

The style of writing is generally clear and concise although there are certain serious points and minor points that need clarification and corrections.

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

The reason behind the hypothesis ie WHY the authors conjected that FAI would be an independent risk factors should be raised in the Introduction part. Did they hypothesize that the higher SES would have higher risk right from the beginning?

Calculation of sample size required to test the specific hypothesis must be presented.

Since the independent variable of major interest is at the family level, it is essential to know how many family were approached and how many responded.

Descriptive statistics of family size ie. mean, sd, min and max, should be given.

Were all eligible subjects in the same household used in the study or just one subject per one household recruited in the study? If the former case is true, then subjects in the same household would have shared some exposure variables, especially family average income. Analysis using assumption of independent sample would bias the results toward getting significant effects of family-level variable including the family average income. The dataset MUST be analysed using multi-level modelling approach where outcome and other individual exposure variable such as age, gender and education are at first level and family income, family size, level of highest education among family member etc are the second level independent variables. The authors will need to use statistical software that can handle this question and need to consult with experienced analysts who can handle the software for such purpose.
Discussion section:

On page 12, the authors stated "We also found there was no significant association between FAI and the prevalence of stroke among rural residents." This sentence is not supported by the results. The authors must include interaction term ie FAI*rural in the model. There is no such result in the table. The whole paragraph may better be removed.

The authors admitted that cross-sectional nature of the study made it impossible to prove causal relationship and they suggested the need for followup studies. Those are two good points. However, they refused the possible role of access to health services since the poor should be less access yet had lower prevalence of stroke. This is seriously incorrect. A cross-sectional survey is usually suffered from survival bias. Cases with longer survival are more likely to be detected in the survey than cases with short survival. In China, a person in high FAI is more likely to get access to better control of hypertension which is associated with thromboembolic stroke which has better survival. A person in low FAI who is less likely to get control of hypertension would be more likely to get haemorrhagic stroke which has higher case-fatality. Moreover, among the patients who have the same type of stroke, those from higher FAI are more likely to get access to better stroke care both at hospital and at home. With this potential survival differential across the FAI gradients, one would expect to find more stroke patients in the household of high FAI, simply because they survived better, NOT because the occurrence is less often. If this survival differential is a good explanation, and not different in occurrence, the policy implication suggested by the authors that stroke control should be focused more in the upper class is definitely wrong.

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

On page 10 the authors discussed "It is well known that, in developing countries, people in lower SES categories are less likely to be obese and to do more overall physical activity than their counterparts in developed countries [24, 25],..." These two references do not have data from developing countries so comparison could not be made.

Stroke status was based on a screening questionnaire and review of medical records. Several stroke patients are not able to answer the question. Did you use information from the proxy (ie. relative in the same family)

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Discretionary Revisions (which the author can choose to ignore)

Discussion section should start with a paragraph summarizing all the findings and not a repetition of introduction.

The sentence "The results of our study proved the positive association between
stroke prevalence and SES ...” should be rephrased. Positive association was found without prior conjecture in the introduction. The word "prove" is too strong.

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

**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 do not have any competing interests.