Reviewer's report

Title: In-home Solid Fuel Use and Cardiovascular Disease: The Shanghai Putuo Cohort Study

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Reviewer: Wei Huang

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Review on EH Manuscript titled "In-home Solid Fuel Use and Cardiovascular Disease: The Shanghai Putuo Cohort Study" by Lee et al.

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The authors assessed association between in-home solid fuel use and cardiovascular diseases (CVD) in a Chinese population. The authors collected questionnaire information on demographic characteristics, exposure to solid fuel use and smoking, and multiple CVD endpoints. The authors compared cardiovascular endpoints between users and non-users, and examined association between various exposure doses (derived) and each CVD endpoint. The authors further examined exposure-response trend, and potential interactions by gender and smoking. The authors concluded that in-home solid fuel exposure might be associated with increased risk for CVD in adult Chinese. The study addressed an important issue in the field of indoor air pollution and health effects. However, I have concerns on the study design and method which need to be clarified or further addressed:

The study population consists of over 14,000 subjects of age 18 to 60 yrs above, and the assessment was conducted for the period before 2007. Due to domestic energy consumption structure changes in the past decades in Chinese cities, the use of solid fuel in homes becomes largely insignificant in urban residents younger than 40 yrs, whereas it was quite significant in subjects above 40 yrs in their early life. In this retrospective cohort study of cumulative exposure to in-home solid fuel use, it’s questionable to relate CVD endpoints with in-home fuel use, without sufficient control on the age and other social economic position (SEP) factors.

I have specific concerns summarized below:
(1) Study population, cohort subject selection criteria, and potential selection bias:

Though the authors noted that a total of 14,068 subjects were randomly selected from census data, the subject selection/exclusion criteria applied for current analysis should be described with more details. As indicated in the manuscript that “biological samples” were also collected for the base cohort, it is not clear whether the subjects were selected from an existing cohort and what’s the primary study rational for the existing cohort? What factors might potentially bias the subject selection for current analysis?

The authors are advised to summarize the number of subjects included in each analyses in a more concise way. At present, the total counts varied in places in Method and Results sections, which is difficult to follow.

(2) Statistical analysis

Ever-use subjects appeared to be largely aged than non-users, of 62.7% above age 50 yrs in ever-users vs 76.3% less than 40 yrs in non-users (in Table 1). The differential age structure between ever-user and non-user groups has impact on sequential between-group comparisons on various CVD outcomes. He et al. indicated that CVD is a leading cause of death in Chinese above 40 yrs (NEJM 2005). In a long-term follow-up, age, gender, education and some other disease factors, are of potential impact on the exposures and outcomes. The between-group comparison analyses should be adjusted for potential confounding factors.

Logistic regression approaches (also in line 3-6 on Page 7 in Results) may be better explicated in Stat section, with an equation.

(3) Results

The authors may consider putting demographic summary statistics first in a separate table.

What’s the rational and implication of comparisons between age, education, BMI, WC, and smoking groups in Table 1? Are those discussed anywhere in the manuscript?

Without controlling for potential confounders, between-group comparison results for CVD is over-stating (in the last paragraph on Page 6). Adjusted comparisons are strongly suggested to be conducted and presented instead.

(4) Discussion and Conclusions

I did not find the discussion was overall responsive to the main findings. Further, the conclusion that “solid fuel use was associated with increased risks of hypertension, CVD, stroke, and diabetes in urban residents in China” is premature.

Based on the review, I suggest for a major compulsory revision for the
manuscript "In-home Solid Fuel Use and Cardiovascular Disease: The Shanghai Putuo Cohort Study" by Lee et al., before it can be considered for publication.

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

**Quality of written English:** Acceptable

**Statistical review:** Yes, but I do not feel adequately qualified to assess the statistics.

**Declaration of competing interests:**

None.