Reviewer’s report

Title: Serum total cholesterol and risk of cardiovascular and non-cardiovascular mortality in old age: a population-based study

Version: 0 Date: 21 Jul 2017

Reviewer: Ben Schöttker

Reviewer’s report:

General comments:

The paper 'Serum total cholesterol and risk of cardiovascular and non-cardiovascular mortality in old age: a population-based study' by Liang et al describes a 10-year follow-up of a population-based cohort with 1059 died to assess the associations of total cholesterol with cardiovascular and non-cardiovascular mortality in old age, and to explore whether their associations vary by use of cholesterol-lowering medications. The follow-up term is relative long and the sample size is large. The author accurately use the Cox proportional hazards model for all-cause mortality and Fine-Gray competing risks regression model for cause-specific mortality. This study shows that the inverse association between high total cholesterol and reduced all-cause mortality in older adults is primarily due to non-cardiovascular mortality, especially among those who are not treated with cholesterol-lowering medications. The result is meaningful for further clinical research. However, some aspects should be mentioned.

Specific comments:

1. Page 4, line 10:

'Institution' should be 'institutions'.

2. Page 5, line 14-25:

The authors didn't show how the comparison of baseline characteristics between alive and died participants. The authors should add statistical analyses to this part.

3. Page 6, line 10:

According to table 1, 'had a higher level of total cholesterol' should be 'had a lower level of total cholesterol'.

4. Page 6, line 8-14:
The text should be rewritten due to the wrong p values in table 1.

5. Page 15:

The P values for current smoking, alcohol drinking, obesity, hypertension, use of cholesterol-lowering drugs and APOE ε4 between alive and died group are not correct. Please check them again.

**Are the methods appropriate and well described?**
If not, please specify what is required in your comments to the authors.

Yes

**Does the work include the necessary controls?**
If not, please specify which controls are required in your comments to the authors.

Yes

**Are the conclusions drawn adequately supported by the data shown?**
If not, please explain in your comments to the authors.

Yes

**Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?**
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics

**Quality of written English**
Please indicate the quality of language in the manuscript:

Needs some language corrections before being published

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