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: 31 Oct 2017

Reviewer: Aileen Chan

Reviewer’s report:

This manuscript reported the associations of total cholesterol with cardiovascular and non-vascular mortality in old age, and associations with use of cholesterol-lowering medications. The manuscript was well written with valid arguments and literature support.

Some areas need to be clarified:

1. Data collection

* Walking speed was measured by asking a person to walk 6 or 2.4 meters. How to determine the distance selected and why?

* Did the blood samples for total cholesterol are fasting blood?

* The blood lipid profile was lacking, this was important in determining the contributing factors of mortality, such as the 'good' and 'bad' cholesterols.

* Cholesterol-lowering medication compliance was also lacking, this would lead to a mislead result if those noncompliance participants were counted as drug users.

2. Results

* Those died during follow-up were less likely to be currently smoking. This result was different from prior literature. It would be better if history of smoking also being reported, e.g., number of ex-smokers, years of smoking, etc.

* 12.4% of subjects used cholesterol-lowering drugs at baseline. These subjects might have lower total cholesterol due to drug effects. Some still had high cholesterol level, was that due to not enough dose or noncompliance to drug therapy?

3. Discussions
When assessing association between total cholesterol and mortality, did smoking also being controlled, as it showed lower mortality? May need discussion on the lower mortality of current smoker.

Overall impression:

The manuscript did not add much new knowledge. The conclusion was similar to prior findings as the results had been well addressed in literature that cholesterol had inverse association with mortality.

The major weaknesses, though addressed as limitations, were the incomplete information on blood lipid profiles and medications for lowering cholesterol. These were the main factors that affected the results.

**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.

Unable to assess

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Yes

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I am able to assess the statistics

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