Reviewer’s report

Title: The effect of modifiable risk factors on geographic mortality differentials: a modelling study

Version: 2 Date: 3 October 2011

Reviewer: Shaun Scholes

Reviewer’s report:

My comments on the first version seem to have been incorporated really well into the second version. I hope my comments were useful. I am particularly pleased to see a Supplementary Appendix giving more details of the modelling. However please see the major compulsory revision below. Estimates from survey data should fall within the limits of the published 95% CI.

Major Compulsory Revisions

1. Could the 95% CIs for SPRs in Table 5 be thoroughly checked. The 4th row gives 1.03 (0.98,1.03) and 1.15 (0.99,1.03). The 10th row gives 1.08 (0.97,1.02).

Sincere apologies if I have this wrong.

In addition, the discussion of Table 5 in the text does not mention the 95% CIs which, for example, seem to suggest no significant differences in SBP between the regions in men. The discussion should take the uncertainty in the survey estimates into account. From my experience as a survey statistician, saying one estimate is higher than another based only on the point estimates is insufficient.

2. The text in the manuscript detailing phase 3 of the modelling is unchanged from the first version. The Supplementary Appendix does a much better job of explaining where age comes in. It explains that the modelling uses age-specific mortality rates within each percentile group (by sex and region). Hence I think it would help readers if the text at the bottom of page 4 in the Appendix replaces the shorter text on page 9 of the manuscript (which I felt was inadequate).

Minor Essential Revisions

There are two tables with heading 4a (i.e. the second 4a needs to be 4b).

Discretionary Revisions

1. The results section in the abstract: 29.40% should be 29.4%.

2. In the 2nd paragraph of background: remove the a in "a Outer Regional/Remote regions"? Or I think you mean "combined Outer Regional/Remote group"?
3. Could a sentence be added to explain why the follow up to 2004 was used - rather than follow up to 2008? Would using 2008 make any difference to the conclusions?

4. In the "modelling the effect risk factors on inter-regional mortality differentials" please replace the word 'get' with 'obtain' (or something similar)?

5. P.10. "The aim of the model is to investigate a theoretical impact of blood pressure"...add the word reduction?

6. Could the section on risk factor prevalence in the results section be placed before the results of the modelling? Discuss descriptive analysis before modelling?

7. Table 5 would benefit from a reminder as to what high risk factor values are (i.e. cholesterol >= 5.5 mmol/l and SBP >=140 mmHg).

8. Do the estimates at the bottom of page 13 refer to the estimates in Tables 6 and 7? If so, could you indicate this to the reader. If not, could you indicate this to the reader by saying "data not shown"?

9. Could the results for men (on page 15) be placed before those for women...to be consistent with other sections.

10. Use cardiovascular disease (CVD) at the top of page 19? Take out the 'a' in "leading risk factor for a death".

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

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I have no competing interests.