Reviewer's report

Title: Is the Scottish population living dangerously? Prevalence of multiple risk factors: the Scottish Health Survey 2003

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Reviewer: john glover

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The article is well-written and presents interesting results, in particular the international comparisons with the Scottish experience. The methods used are clearly described, the data are from a well-recognised source and generally support the findings. The article will be of interest to a wide audience and should be published.

The following comments are made for the authors' consideration.

- Discretionary Revisions (which are recommendations for improvement but which the author can choose to ignore)

1. In the abstract, the authors state ‘These behavioural patterns were socioeconomically determined’ – this statement is repeated on page 11, at the end of the Discussion. These statements appear in conflict with the sentence on page 7 that ‘Furthermore, the detailed pathways and mechanisms between the socioeconomic determinants and the risk factors investigated cannot be fully determined from this study’. The former statements infer causality, the latter suggests this can’t be done (from these data).

2. Overweight and obesity are treated as one category (following the WHO BBD Project): it would be of interest to see the results for obesity as a separate group, as this group has, in my experience, even stronger associations with deprivation and poor health outcomes.

3. The Cole cutoff for overweight is quoted as >25. My reading of the Cole article and its application in many studies is that the cut-off is 25, not >25 – and despite a lack of clarity elsewhere, Cole’s Table 2 is title ‘Centiles and z scores for overweight corresponding to body mass index of 25 kg/m² at age 18 years in six datasets …’, supports that view?

4. The education variable used shows powerful results: it can also be useful to look at those who did not complete formal schooling – albeit a smaller group, but also a group with greater disadvantaged.

5. Under ‘Results’, it is good to see the clear statement about the response rate to the survey used and the proportion with full data – and the inclusion of the Table 1 data. I think mention should be made in this para of the overall response rate being 54%, and also the differentials in response by deprivation quintile, as
that for males in Q5 is markedly different from that in Q1. Table 1 could usefully include an additional column of comparative data from the most recent census or survey – what % of the population is aged 40-64?

6. Re Table 3 discussion, comment re ‘Similar results …’ – ‘similar, but generally much stronger,’ would be more appropriate. I would swap the columns, as the discussion is largely about the (2 or 3) column.

7. Under ‘Discussion’, the following sentences (p. 7) are not easy to read – the first thing I noticed was the substantial and the 20% - on re-reading it was clear, but would be better to avoid the double negative.

‘This study also shows that when considering single behavioural risk factors in isolation, it is reasonable to expect that a substantial proportion of the population will not have the risk factor. Even the most prevalent risk factor – poor diet – is absent in 20% of the population.’

8. And the following sentences about ‘most’ – 62.8 and 65.1% would be best put as around two thirds, as they wouldn’t generally be seen as representing ‘most’.

9. Some part of the following sentence (p. 8) is missing: ‘However, it is likely that a lower percentage of individuals would have participated which potentially could reduce the representative of the response particularly with respect to socioeconomic bias.’ This is an important area and deserves discussion (as I noted in comment 5) – and it seems that, from Table 1, the ‘lower percentage of individuals (from most deprived groups)’ is, for males, 19% (rate ratio of 0.81 for SIMD quintiles).

Given the rate ratios of 0.81 for males and 0.89 for females for SIMD quintiles in Table 1, the sentence ‘The Scottish Health Survey is considered to be a socioeconomically representative sample, ‘ doesn’t appear appropriate – although the second part does – ‘and any participation bias would likely contribute to even greater associations with the socioeconomic factors’. I think it would be better to drop the reference, refer to these figures from your analysis, and keep in the last part of sentence.

10. Re the comment (p. 8) ‘Comparing our findings with similar analyses in surveys from across the world (Table 4)’ it would be very useful to if it was a true comparison, sorting the other studies by commonality of risk factors (the same five, or four) and adding in the authors’ results for the same grouping, rather than comparing the proportions from their five with four in other studies. And the n= should be removed from the table.

When this comparison is made there are still important differences, but the results for the USA (2001) and Netherlands (1993-97) studies aren’t so different.

**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 have no competing interests