Reviewer’s report

Title: Intra-cluster correlation coefficients in adults with diabetes in primary care practices: The Vermont Diabetes Information System Field Survey

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Reviewer: Martin Gulliford

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Intra-cluster correlation coefficients in adults with diabetes in primary care practices

This is an interesting and useful paper that presents data for intraclass correlation coefficients estimated from 73 primary care practices in the Vermont area. There are a number of areas in which the paper would benefit from revision.

Major compulsory revisions

1. In general the paper clearly describes the work that was done but it is not particularly well written. Considerable attention could be given to redrafting the paper. Specific suggestions include:

Abstract line 2: ‘outcomes’ should be used instead of ‘variables’

Abstract line 5: the figure of 8,808 is a bit misleading as most ICCs were estimated from a subsample of about 1,000 which based on a response rate of 64%. These points should be included in the Abstract.

Abstract, line 9: ‘ICCs varied widely’ - describe the distribution using median and range or interquartile range. This should be done separately for continuous and binary variables (see below). Also ‘likelihood of’ should be ‘proportion with’.

Background, line 5: ‘will be in error’, state what the nature of the errors will be.
line 14, ‘inflationary factor’ should be ‘variance inflation factor’

2. In the methods section, it would be worth describing the health care context in more detail for an international readership. How were the primary care practices sampled? What are the practices like? For example, how many doctors, nurses or other health professionals are present? What is the nature of the relationship of the patients to the practices in terms of long-term registration or receipt of care? Do the practices provide most diabetes care or do patients also attend specialist clinics for diabetes screening activities? Are the practices urban or rural?

3. The measures used are generally clearly described. However, it is not clear whether the blood analytes were estimated from a specially taken sample or whether routine clinical measurements were used. Was the blood sample taken fasting?

4. The section on statistical analysis needs to be expanded. An algebraic definition of the ICC should be given. The estimation method used should be stated (was one way analysis of variance used?). A word of justification for applying this method to binary outcomes should be given. What method was used to estimate the SE. Presenting confidence intervals for the ICC would be more relevant. How did the authors deal with missing values, departures from normality, and ordinal variables?
5. In the Results section, data for the binary outcomes should be separated from the continuous outcomes as completely separate Tables. The SD should be given for the continuous outcomes. For both continuous and binary outcomes, the number sampled per practice should be presented in the Tables as no (n-nought). It seems strange to see the data presented for demographic and economic variables as these are unlikely to be considered as potential outcomes for a study. If they are to be included then this should be justified. The text associated with the results includes some discussion.

6. The Discussion could be extended with reference to other recent papers, including the following papers and the references cited in them:


Campbell et al suggest that ICCs are higher for process measures than for outcomes. Is this confirmed in the present data?

We showed that there is an association of ICC and prevalence for binary data. Is this confirmed?

What were the effects of adjusting for variables such as age, sex and socioeconomic position.

How generalisable are the estimates between health care systems?

In summary, an interesting paper. The presentation of the material needs to be developed and refined from a statistical point of view.

**What next?:** Unable to decide on acceptance or rejection until the authors have responded to the major compulsory revisions

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Needs some language corrections before being published

**Statistical review:** No

**Declaration of competing interests:**

I declare that I have no competing interests