Reviewer's report

Title: NHS Health Checks through general practice: randomised trial of population cardiovascular risk reduction

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Reviewer: Angela Craigie

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Overall I found this paper to be a well written and well balanced account of an important evaluation of a national screening programme. I have much sympathy for the authors who did well to modify their study in light of the launch of the NHS health checks. Whilst I have provided a number of suggestions for editing, most of these are to improve the clarity to the reader.

- Major Compulsory Revisions

1. Results: In order to truly be able to answer whether one intervention is better than another, I feel it is important to report whether the degree of change seen in the ‘Health check plus’ group was smaller or larger than the change seen in the ‘Health Check’ group. I may have missed it or misinterpreted some of the findings, but as yet it appears as if only separate comparisons between the groups at baseline, and at follow-up have been made. This only tells us whether they were significantly different at these two time points, and not whether one intervention was better at bringing about improvements than the other. I would recommend that this further analysis is added before publication.

2. Results: Final paragraph. Mean scores seem to have been given for diet and physical activity. Given that these are categorical variables, I’d have thought that means would not be appropriate. It also seems inappropriate to give mean scores to one or two decimal places when participants would only have been allocated scores with whole numbers. Please check with a statistician and amend if necessary.

3. Conclusions: Whilst the statement ‘there was no further reduction in risk measure from the additional lifestyle support package offered to patients” may well be true, I don’t think it can be made without carrying out the analyses recommended in point 1.

- Minor Essential Revisions

4. Abstract: It is stated that there were ‘601 (365, 236)’ patients – please state what the two numbers in brackets relate to.

5. Methods: Outcome measures - A relatively crude method has been used to categorise the lifestyle variables, particularly diet, and I have doubts that it would not be sensitive enough to pick up on some of the changes that may have occurred. For example, improvements to one or two aspects within a category
may be insufficient to move someone from e.g. ‘poor’ to ‘average’, yet they would still be considered improvements. I think it is important to acknowledge this.

6. Methods: Randomisation and recruitment - I found the recruitment of participants to the trial is a little confusing and although it is possible to refer back to Davey et al. (2010), it would be helpful to briefly summarise the recruitment process as this would also bring clarity to the reason as to how some were excluded as they were already seeing their GP or receiving treatment. If there were any changes to the protocol for selection and recruitment of participants (prior to randomisation), please also specify this.

7. Methods: Intervention compared - although I realise the detail can be found in the previous publication (ref 17), it would still be helpful to provide a brief summary of the structure and content of the intervention. For example, the format (telephone or face to face, individual or group sessions), how often they were seen and how many times.

8. Results: A large proportion of potentially eligible patients were excluded on the basis that they had already been seen by their GP and were receiving some sort of treatment. Was there any potential to modify the recruitment process to avoid this and could this have affected the representativeness of the sample? If so, this may be something that could be picked up in the discussion.

9. Table 1: Please define the cut-offs used to define ‘deprived’, ‘intermediate’ and ‘affluent’.

10. Results: Para 2 – it is noted that ‘Changes in HDL, weight and BMI were negligible, though a small significant reduction in BMI of 0.25kg/m2 was noted’. Technically a reduction in BMI was only found for the ‘Health check plus’ group so this should be clarified, particularly as the Health check group’s BMI had actually increased marginally. As a minor point, it is also noted that the units in this sentence are to two decimal places whereas the table is only given to one decimal place.

11. Table 4: The formatting of this table is quite confusing. Please amend it to make the distinction between which values are the means and which are the 95% confidence interval values clearer e.g. by using brackets.

12. Table 4: It would be useful to specify that the follow up values were subtracted from the baseline values to clarify why positive values refer to a reduction and negative values refer to an increase.

13. Table 4: It may be a misinterpretation on my part, but please check the values for weight and BMI. Table 2 suggests that for both of these, the ‘health check’ group increased whilst the ‘health check plus’ group decreased, whereas Table 4 suggests both groups reduced their weight and BMI.

14. Table 5: Given the different numbers of participants in each group, it would be helpful to show the percentage of patients with the risk factors at each time point. This would allow an easier visual comparison of the two interventions. Removing the numbers without the risk factor would also simplify the table.

15. References: Reference 19 is no longer available and should be updated.
- Discretionary Revisions

16. Abstract: If possible within the word limit, it would be helpful to add some more detail on the ‘health check plus’ intervention, e.g. in terms of format (telephone vs. face to face, individual vs. group), duration, frequency and number of sessions.

17. Methods: Outcome measures. References to cut-offs used for high cholesterol, blood pressure and BMI would be beneficial.

18. Figure 1: Since a relatively large proportion of potential participants were excluded for ‘other reasons’, it would be helpful to break this down according to the reasons listed in the text. This would also save the reader having to refer to the text for further information.

19. Table 3: To ensure the tables stand-alone without the need to refer to the text, I’d suggest a footnote is added whereby the factor abbreviations are defined, as they are in the text. Alternatively, rather than give the abbreviations in the ‘Factor’ column, the full titles could be given removing the need to have any of these abbreviations in the paper. The coding, particularly where it isn’t obvious e.g. for gender, should also be added as a footnote.

20. Statistical analysis para 1, Results and Table 3: Two ways of expressing the levels used in the model appear to be used interchangeably - Levels 1, 2 and 3 or practice level, individual level and identifier variables. For clarity, it would help the reader if only one system was used, preferably the latter which is more meaningful.

21. Discussion: The last sentence in paragraph 1 seems quite negative to the programme overall whereas I’d have thought the question over cost-effectiveness would relate more to the lifestyle intervention aspect. Should it be revised to read “… population readiness to make changes is not as good as it may need to be to make the NHS Health Check plus programme cost effective as a national policy’?

22. References: The General Practice Physical Activity questionnaire reference refers to the report, which is fine, but it would be useful to also add a reference to the questionnaire itself.

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 declare that I have no competing interests.