Reviewer’s report

Title: Lifestyle precision medicine: the next generation in type 2 diabetes prevention?

Version: 1 Date: 13 Jul 2017

Reviewer: Jason Gill

Reviewer’s report:

This is an interesting review on the potential of lifestyle precision medicine to enhance the potential for prevention of type 2 diabetes. The review is well-written and comprehensive. I have the following comments which the authors may wish to consider when revising the manuscript to improve it further.

1. The first part of the manuscript includes a comprehensive review of modifiable lifestyle exposures which could alter risk of diabetes. This is novel and informative. I appreciate that the authors are attempting to quantify the strength of evidence for each of these factors in their strength of evidence score, but I am unsure whether it is possible to combine different aspects of a study into a single score as they have attempted. For example, I am not sure what the appropriate weighting should be for duration of followup vs size of study vs type of study here, and it would seem that different weighting choices would influence the findings and interpretation. For type of study, I am not sure that I would necessarily score an intervention study without controls lower than a nested cohort study. As a minimum I think that it would be helpful for the authors to provide some more justification of the weighting choices that they made when devising the evidence score. Even better, in my opinion, would be not to attempt to combine the findings from different types of study into one score. Broadly, I think it would be helpful if the authors could do a bit more to link this to the first section. A wide range of potential lifestyle factors associated with diabetes risk were reported in the first section (e.g. coffee drinking, stress, alcohol, red meat etc). It would be helpful if the authors might be able to structure the second part of the manuscript to consider evidence (of any) for how risk associated with these lifestyle factors could vary according to genotype or other -omic
characteristics. They could also point out areas where evidence for differential risk by genotype etc does not yet exist.

3. It would be helpful if the authors in their conclusion could point out their vision about what future studies might be needed to advance the field of precision lifestyle medicine. What are the gaps which still need to be addressed? Perhaps they could provide researchers of a checklist of things that need to be considered when designing studies in this field in order to advance understanding? What are the future analytical approaches that may help advance the field?

Minor.

1. Please define the exposures reported in the legend. What are POPs? How were healthy/unhealthy diets, long work hours, healthy lifestyles etc defined?

**Are the methods appropriate and well described?**
If not, please specify what is required in your comments to the authors.

No

**Does the work include the necessary controls?**
If not, please specify which controls are required in your comments to the authors.

Yes

**Are the conclusions drawn adequately supported by the data shown?**
If not, please explain in your comments to the authors.

Yes

**Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?**
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

Not relevant to this manuscript

**Quality of written English**
Please indicate the quality of language in the manuscript:

Acceptable

**Declaration of competing interests**
Please complete a declaration of competing interests, considering the following questions:
1. Have you in the past five years received reimbursements, fees, funding, or salary from an organisation that may in any way gain or lose financially from the publication of this manuscript, either now or in the future?

2. Do you hold any stocks or shares in an organisation that may in any way gain or lose financially from the publication of this manuscript, either now or in the future?

3. Do you hold or are you currently applying for any patents relating to the content of the manuscript?

4. Have you received reimbursements, fees, funding, or salary from an organization that holds or has applied for patents relating to the content of the manuscript?

5. Do you have any other financial competing interests?

6. Do you have any non-financial competing interests in relation to this paper?

If you can answer no to all of the above, write 'I declare that I have no competing interests' below. If your reply is yes to any, please give details below.

I declare that I have no competing interests

I agree to the open peer review policy of the journal. I understand that my name will be included on my report to the authors and, if the manuscript is accepted for publication, my named report including any attachments I upload will be posted on the website along with the authors' responses. I agree for my report to be made available under an Open Access Creative Commons CC-BY license (http://creativecommons.org/licenses/by/4.0/). I understand that any comments which I do not wish to be included in my named report can be included as confidential comments to the editors, which will not be published.

I agree to the open peer review policy of the journal