Reviewer’s report

Title: Potential gains in health expectancy by improving lifestyle: an application for European regions.

Version: 1 Date: 15 Aug 2018

Reviewer: Roland Rau

Reviewer's report:

Dear Editor,

Dear Authors,

Thank you very much for sending the revised manuscript to me. Most of my criticisms have been well addressed. Nevertheless, I still see problems:

- The main issue I still have is the classification of BMI. I disagree with the authors who insist that they want to keep three categories. It is probably correct that there are very few data points for underweight people. But almost any research article, which addressed the issue of a BMI below 18.5 showed that mortality increases tremendously compared to people with "normal weight". Even if the estimates for underweight people are not-significant or problematic, using an extra category would avoid the distorted effect for "normal weight". My expectation would be that the differences between the categories would even become bigger as the baseline mortality risk of people with normal weight should decline once underweight persons are excluded from this category.

- Furthermore, I can see that reviewer #1 has also major concerns with regard to alcohol related mortality. I was very happy to read that they addressed the "problems with alcohol" in more depth. But I have still this uncomfortable feeling how we can be sure that we can trust the estimates of the other risk factors? As far as I can see the whole package/software was only employed by the same people (checking the references and the DYNAMO-HIA website). Maybe this is the fate of many clever projects but it does not boost the confidence for outsiders. And what does it mean to select the best in "...and selected the best available to estimate risks" (line 107 of manuscript)?
- A minor issue is rather technical (and maybe personal curiosity). In the reply to my first set of comments, the authors write that they used the VGAM package of R. I mainly use the function gam() from package 'mgcv', which is included in any standard distribution of R, whereas VGAM is an add-on package. If gam() from 'mgcv' is not used, people use choose gam() from package 'gam', written by Trevor Hastie, one of the "inventors" or generalized additive models. So I wondered why the vgam package is used since the standard gam() can also estimate multinomial models. As I said: This is nothing crucial but would be interesting to me.

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- An article of importance in its field

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

- Acceptable

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