Reviewer’s report

Title: Health of Spanish centenarians: a cross-sectional study based on electronic health records

Version: 0 Date: 26 Feb 2019

Reviewer: Karen Andersen-Ranberg

Reviewer's report:

The centenarians belong to a highly interesting population of very old persons who have survived to an extreme age. And the authors seem to have found a solid and almost complete centenarian population in a public health system. However, it does not make sense to compare the centenarians with younger persons in the same time period, as they would belong to younger birth cohorts. Moreover, period effects also apply. In other words, the authors are comparing apples with pears and plums. The data are heavily biased by being depending on health care use, which depends on a number of things, e.g. access to, family support, discrimination towards oldest olds etc. All in all, I do not recommend this study for publication in its present form, i.e. the comparative analyses. The only way to compare centenarians with persons of younger age, is if you would have data of people born in the same year, but dying at a younger age. One exemplary study was made by Oksuzyan, A and published in Age and Ageing in 2013 (DOI: 10.1093/ageing/aft031). This study using hospital admissions showed that centenarians had fewer hospitalisations than their age peers who died earlier than age 100.

Yet, I do recommend a major revision, by which I mean and suggest that the authors keep to the centenarian population and describe them as they are. To my knowledge, no Spanish centenarian study has been published in an English language journal, which is why I think it would be of interest, despite the retrospective nature and the bias described above. But if these weaknesses are addressed in the discussion, I think it would be of interest.

Minor points:
The authors should reflect upon the methodology and sample sizes in the referenced centenarian studies. Some studies used retrospective data, incl. memory recall, and very selected populations, others made epidemiological prospective projects visiting all participants in their domicile and did objective clinical assessments. It should also be taken into account how representative the centenarian study populations were. What were the participation rates? Were proxy interviews allowed?

The number of centenarians is not increasing due to increased life expectancy, but due to substantial declines in old age mortality together with larger birth cohorts. See e.g. articles by J.W. Vaupel, B. Jeune.

Multimorbidity and hospitalisations in centenarians are difficult to assess as you do not know whether diagnostics were reduced do to their high age (ageism - discrimination due to high age). Do you have the causes for hospitalisation?
If the authors want to use the EDC, it should be mentioned why they made that choice. Did other centenarian studies use it?

Don't use the wording: "The elderly" - it is considered ageist, and pejorative.

The geographical area where the centenarians are living is not interesting. The question is, did they live there their whole life? Or did they move to this area at a high age to be closer to the family? How many lived by themselves? In nursing homes? living with family?

**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.

No

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

No

**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.

I am able to assess the statistics

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

Needs some language corrections before being published

**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