Reviewer’s report

Title: Harnessing repeated measurements of predictor variables for clinical risk prediction: A review of existing methods

Version: 0 Date: 13 Mar 2020

Reviewer: Ram Bajpai

Reviewer's report:

I have reviewed the manuscript titled "Harnessing repeated measurements of predictor variables for clinical risk prediction: A review of existing methods". This manuscript is well planned and presented by authors. However, there are following points that required clarification from authors;

As title of this review suggests that it is a review of existing method. So being a reader you expect all key features (such as available methods, sample size, validation methods etc.) of clinical prediction models. However, this article has only focused on the available frameworks. Other aspects either overlooked or left for future research. Being a reader, I may be over expecting to provide each and every information in just one article. However, a brief description for each key feature is expected with some good citations so readers can get some further useful information.

Authors have also considered machine learning (ML) models as one of the classification. However, no specific search terms were used to find ML models related to longitudinal data. For example, random forest for survival (FR-S), CForest, and Rangers etc. So, in my opinion, ML longitudinal models terminology should have been used in key words to find appropriate articles. Following references may be useful for time-to-event data;

Inclusion Criteria Set B, point 2 says at least one predictor is used for abstracts and full-texts screening. However, at least two predictors should be considered to form a multivariable risk prediction model.

As model validation is an important part of any clinical risk prediction model. Therefore, authors should also consider one more table showing common methods for model validation (i.e. discrimination and calibration) for each framework. Readers of this article would like to know this info in addition to the available frameworks.

Level of interest
Please indicate how interesting you found the manuscript:

An article of importance in its field

**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/](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