Reviewer’s report

Title: The current application of the Royston-Parmar model for prognostic modelling in health research: a scoping review

Version: 0 Date: 29 Sep 2017

Reviewer: Willi Sauerbrei

Reviewer's report:

This is a nice paper which will help the Royston-Parmar (RP) model to become much more popular in practice. I have a minor point with the title and one major point with each of the two main parts of the paper.

1) The title is too general. You consider only the Royston-Parmar model and that should become obvious from the title. Other approaches can be considered as 'flexible parametric survival models'.

2) The RP model is suitable for flexible modelling but your description is extremely positive without pointing to any potential drawback (what about necessary assumptions, numbers and placement of knots), and without providing any empirical evidence (eg by simulations) for these statements. In your review only 2 of 12 papers mentioned a minor limitation - but that is the summary from a highly selected group of modelers who decided to use the RP approach. Is there any paper which provides more evidence that RP is much better than Cox and other competing approaches? Always or in more specific situations? In the review you excluded such studies (see (ii) on page 10)).

At least you should modify some of your statements to better reflect current knowledge. Better would be a section about the studies comparing RP with other models.

3) Your review provides some ideas of the weaknesses of using RP models. Number of knots vary strongly without giving any reason for it and the placement is often not given (see Table 2). The latter may only be a problem of reporting or the analysts may have played around with numbers and placement of knots and give results from the best fitting model. Overfitting may be a (severe) disadvantage of the RP model. In times of increasing awareness of transparency, good reporting is an important part of each paper. Do you have ideas how to report an RP model in a suitable way? You were surprised that number and placements of knots were often not reported (426). I am surprised seeing a summary of survival analyses without seeing the effective sample size (number of events) and the number of variables in the study (univariable analyses, 10, 20 or more variables in a study? Any variable selection method used? (see Table 2)). Some (not all are relevant for your
summary) of the items of the REMARK and TRIPOD guidelines provide help for better reporting.


**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/). 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.