Reviewer's report

Title: Prognostic survival model for people diagnosed with invasive cutaneous melanoma

Version: 1 Date: 10 October 2014

Reviewer: Branko Miladinovic

Reviewer's report:

The article "Prognostic survival model for people diagnosed with invasive cutaneous melanoma" by Baade and colleagues develops a new prognostic survival model for the patients diagnosed with invasive melanoma. As a reviewer, I am glad that more flexible survival prognostic models are being developed. I have found the article to be well written, with a few suggestions to make it more useful to the reader:

Major

1. It would be useful if the authors commented on other (if any) survival models that have been proposed for melanoma patients in the past. This was not clear in the manuscript and from references 11-13. A thorough literature search may be in order.

2. Although the authors did not detect any significant time-dependent effects, it would be useful to the readers to mention in the Discussion that in the presence of (multiple) time-dependent effects, interpreting the time-dependent hazard ratios is difficult in the log cumulative hazard framework of the Royston-Parmar models. For alternatives, refer to Crowther and Lambert, "A general framework for parametric survival analysis," Stat in Medicine 2014, DOI: 10.1002/sim.6300

3. I presume that the readers of BMC Cancer are clinicians and not statisticians. It would be useful if the authors elaborated on page 9 what "while there was some evidence that sub-site had a time-dependent association with survival..." means or implies clinically.

4. On page 14, the authors refer to the impact of competing risk within the flexible framework. Some work has been done recently in that area (see Hinchliffe and Lambert. "Flexible parametric modeling of cause-specific hazards to estimate cumulative incidence functions" BMC Medical Research Methodology 2013, 13:13.).

5. Finally, presuming the authors would want their model to be tested and used in other (heterogeneous) populations, it would be useful if they commented in the Discussion on how a researcher may do so in the context of the Royston-Parmar survival model, knowing the baseline function, scale used (probit), the knot positions and the prognostic indices the authors report in the manuscript.
Minor

1. Page 5, last sentence should read "The Royston-Parmar models were fitted using the stpm2 package (20, 28)."

2. The authors use "multivariate" instead of "multivariable" throughout the manuscript (page 6, page 9 heading "Multivariate analysis").

**Level of interest:** An article of outstanding merit and interest in its field

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests