Reviewer’s report

Title: Evaluating the impact of prediction models: lessons learned, challenges and recommendations

Version: 0 Date: 15 Dec 2017

Reviewer: William Whiteley

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1. The English is rather tortuous - suggest editing to improve readability

2. The model doesn't seem to have very good discrimination - could you write a sentence to either explain why this was not felt to be a problem (or explain to me if I have misunderstood).

3. It is always a problem to know if the association between predictors and outcomes changes over time and populations and practice changes; does this need more cycles of testing and validation? How often should this be done?

4. If a model is ready for practice, it's surprising that predictors should be missing; is this because users didn't want to fill in the model, or because they thought it was irrelevant?

5. P8 suggest that you discuss the relative weakness of a before and after design compared to the cluster randomised design, which may also account for your observed difference.

6. Was the direction to treatment (i.e. probability threshold) in the second trial derived from patients preference, clinician recommendation, or something else?

7. P9 Is it feasible to train uses on a model's underlying assumptions or idiosyncrasies? Surely these should be either ironed out, or made obvious in the interface?

8. Should the control group of interventions based around predicting prognosis be usual care, or the use of another model, or some other systematised way of thinking about prognosis (even a checklist with the question: do you think this patient is at high risk of PONV?).

9. P14: stepped wedge and cluster randomised before and after period studies are also possible

10. It seems very inefficient to study each model in a new cohort. It would strike me as much more sensible to study these in situations where there is already ongoing data collection (for example hospital or nationally based audits), which have the advantage that the decisions are implicitly important (because they have been chosen as a quality metric) and the cost of data collection is borne by a non-research team (reducing cost)

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