Reviewer’s report

Title: A simple, step-by-step guide to interpreting decision curve analysis

Version: 0 Date: 18 Feb 2019

Reviewer: Jannick Dorresteijn

Reviewer's report:

In this manuscript, the authors have given an introduction in interpreting decision curve analysis, a method to evaluate prognostic models and diagnostic tests. This method has been increasingly used in the past years, but many researchers do not exactly understand how to interpret this analysis. The authors offer a step-by-step explanation in which the different aspects of the curve are described in detail, especially the variables of both axis, net benefit and preference, are discussed. Then, several common questions about the use of decision curve analysis are answered. The manuscript does not cover the calculation of the decision curve analysis, for this they refer to previously published articles.

Major comments

The main goal of this manuscript is to give a clear overview of DCA for people not currently working with these curves, e.g. explain clinicians how decision curves should be interpreted. Because I am already familiar with this topic, I asked a PhD student in my group to read the article. He told me that he still found it quite hard to interpret the graphs. He searched for additional resources online to find out what exactly was meant with net benefit in this context or how this method differed from different metrics. Therefore, I think the authors should elaborate more on this basic concepts of DCA, for example:

* Provide an explanation of DCA methods in the introduction.

* Show the actual formula for net benefit as explained in the original article form Vickers and Elkin in 2006.

* Explain the differences between DCA and other metrics of model validity

* Expanding the illustration example from line 58 in step 4 with costs.
Minor comments

1. In the introduction, the authors state that even mastery of any step will give insight in a published decision curve. However, as the decision curve analysis is quite complicated as a whole to understand, I think this should in fact read 'all steps'.

2. In step 2/line 30: y-axis is stated where I think x-axis is meant.

3. At the end of step 2/line 50 the authors use an extremely worried patient as an example of a patient that would go straight ahead for biopsy. From a clinician point of view, however, it is not realistic/advisable that extremely worried patients with very low risk of cancer all get biopsies. Consider rephrasing.

4. If I understand the concept of preference correctly, it would also be possible to use the (minimally preferred) number needed to treat/test on the x-axis (or Number Willing to Treat). For didactic purposes, this might be easier to understand for especially clinicians who may not be used to odds.

5. Question 4- whether there should be confidence intervals: the authors state that "these are not important concepts in classic al decision theory." This could be elaborated in one or 2 sentences to explain why this is not important.

6. In the conclusion, the authors summarize their results from a Pubmed search. This section would fit better in the introduction than in the conclusion.

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:

Not suitable for publication unless extensively edited

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