Reviewer’s report

Title: Machine learning can predict survival of patients with heart failure from serum creatinine and ejection fraction alone

Version: 1 Date: 08 Dec 2019

Reviewer: Slade Matthews

Reviewer's report:

The authors have addressed my concerns in their revised manuscript. I think that there are two main issues that must be borne in mind, the first concerns the claims made in the paper about the utility of this model that clinicians can and should change their practice based on a single study - this is not how such tools are adopted - surely! The authors should tone down such claims to be a little more realistic since further confirmatory studies are essential before an ML model is taken up into clinical practice. That brings me to the other issue which is that this paper seems to me an exploratory paper about the utility of ML and certain combinations of variables in predicting survival. From my point of view as an ML practitioner it is an interesting paper but I agree with reviewer 2 that claims made should be kept realistic.

So one thing I would suggest the authors attend to is the conclusion in the abstract where it says "This discovery can have immediate impact on clinical practice" perhaps "This discovery has the potential to impact on clinical practice" would be more accurate since as I stated earlier further studies of this model - preferably a prospective study using new patients should be implemented before the model is adopted in the clinic.

There are also a few minor points that I would like to point out for correction.

1. Page 6 "receiver characteristic operating (ROC) area under the curve" is not correctly described although it is correct in 4 other places in the manuscript. ROC stands for "receiver operating characteristic" which stems from its roots in signal detection see SWETS, J.A. (1964). Signal detection and recognition by human observers: contemporary readings. New York: Wiley.

2. I note that you have put the SD’s into table 3. The symbol in the header seems to be the Greek letter rho while it is usual to employ a lower case sigma to denote SD.

3. Table 7 contains Chi-square results but it appears P-values are reported under "Chi Square"

On the whole the statistical section of the paper remains unclear and the authors should show this to their statistician for further improvement before publication is warranted.

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.
Yes

**Does the work include the necessary controls?**
If not, please specify which controls are required in your comments to the authors.

Yes

**Are the conclusions drawn adequately supported by the data shown?**
If not, please explain in your comments to the authors.

Yes

**Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?**
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I am able to assess the statistics

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