Reviewer’s report

Title: A classification framework for exploiting sparse multi-variate temporal features with application to adverse drug event detection in medical records

Version: 0 Date: 28 Jun 2018

Reviewer: Jonathan R. Nebeker

Reviewer's report:

This review needs to start with a big warning that I am not qualified to review the bulk of the methods, as I am not expert in math, ML, or statistics. I am an epidemiologist, physician, and expert on ADEs.

Regarding the mathematical methods: The framework for the approach addresses many problems that I have encountered in adverse event modeling. Therefore, this work appears to be a significant contribution to the literature.

However, there are significant limitations in the methods that seem to arise from insufficient clinical input. The dependent-variable classification method is likely to result in a high level of false negatives—probably in the range of 10% to 20% true negative. The data appears to be restricted to ICD10 and laboratory tests. Many of the targeted ADEs do not call to my mind string associations with variation in frequency or value of laboratory tests. There are much stronger clinical associations with medications and other clinical data.

The above limitations are not fatal to the publication. However the limitations section needs significant revision. The conclusions that this is a good method for ADEs in general is also too strong. I strongly recommend adding an author who is a clinician with related methodological experience.

I think that the appropriate conclusion is that this is a very promising approach that deals with common problems with information representation in clinical data and that more study is warranted on more rich clinical data with better dependent variables.

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

Unable to assess

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

No
Are the conclusions drawn adequately supported by the data shown?
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Unable to assess

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If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I recommend additional statistical review

Quality of written English
Please indicate the quality of language in the manuscript:

Acceptable

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