Author’s response to reviews

Title: A Bayesian Decision Support Sequential Model for Severity of Illness Predictors and Intensive Care Admissions in PneumoniaShort/ Running Title: Bayesian Pneumonia Decision

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Version: 1 Date: 13 Sep 2019

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We thank the reviewers for their valuable comments and the opportunity to improve our paper.

We have also included analyses with new statistical tool we developed called "Bayesian Number Needed to Diagnose”. This will be the first time such tool is published and we welcome the opportunity.

Specific items revised are below:

Reviewer #1

1. after reading the abstract, I have no idea on the reference standard of the diagnostic study. since it is a meta-analysis, the results section should report the number of studies included and in accordance with the reporting guideline (http://www.equator-network.org/reporting-guidelines/prisma-dta/); the full text manuscript was not written according to this guideline. Strongly suggest to adhere to this reporting guideline before considering for publication.

The study uses a "data recycling" method developed by our group. I did not produce original meta analysis data, but simply integrated the best available data inside our Bayesian model. We have revised the full text and believe we are in adherence with EQUATOR Network guidelines.

2. Many important aspects of a meta-analysis of diagnostic test is missing due to the fact that the authors did not follow the reporting guideline. for example, the risk of bias for each study was not assessed.

See #1
3. At least, the included component trials should be reported for baseline characteristics. All direct references are included

Reviewer #2

1. Critical is the use of Bayesian inference. Not everyone is familiar with the Bayesian approach, and therefore a good motivation as to why Bayesian framework is preferred should be included in the introduction. We have included new items on the intro and discussion sections.

2. Please define the following terms/acronyms as used throughout the document: CURB65; BUN; Done

3. Line 14 - page where the conclusion is: replace "off" with "on" to read ...Our study is based on meta-analysis." Done

4. Contributory statement: Please use initials at peer-review stage. Done

5. Tables should have footnotes to define terms like PCT, LR+,LR- Done