Author's response to reviews

Title: Measuring agreement between decision support reminders: the cloud vs. the local expert

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Author's response to reviews: see over
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Dear Editor,

Please find our revised manuscript, “Measuring agreement between decision support reminders: the cloud vs. the local expert,” enclosed for your consideration as a Research Article.

We greatly appreciate the time of the editors and reviewers. Please find below our responses to each of the constructive critiques provided in the previous review. We explain how we have addressed the comments in the revised manuscript, or we provide our rationale for why changes were not made to the manuscript text. Given the useful critiques, we believe the revised text is stronger and provides information that can be applied by the reader.

Associate Editor
"The authors should especially address the issue of avoiding the term "cloud-based" without explaining the difference between a usual online system and the cloud-based approach. I would recommend removing the term "cloud-based"."

AUTHORS’ NOTE: We respectfully disagree with the Assoc. Editor and Reviewer 1 regarding their suggestion to drop the term ‘cloud-based.’ The CDS system at Partners was implemented as a Software-as-a-Service (SaaS) model in which the knowledge base and rules engine run remotely in a community cloud according to the definition from NIST (The NIST Definition of Cloud Computing: Recommendations of the National Institute of Standards and Technology). Therefore the term is appropriate.

In the following paper, we describe the technical details of the cloud-based CDSS at Partners. We did not wish to repeat that content in this paper given the new manuscript’s emphasis on comparing the output of Regenstrief’s local system with the Partners’ cloud-based system. However, we have added a bit more detail to justify the use of the term cloud-based (see pages 8 and 9). We refer readers to the other paper for greater explanation on how the SaaS model implemented by Partners works.


Reviewer 1

Major
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1) The term "cloud-based" seems to have no relevance to your work (buzzword only?). Although one CDSS is remotely hosted and accessed via SOAP requests, this does not justify the term cloud-based, IMHO. None of the traditional cloud characteristics is used or required and you do not consider it a keyword either.

=> please consider removing it (or e.g. replace by "remote", "web/webservice-based")

AUTHORS’ NOTE: Please see comments above. In addition, we did not choose it as a keyword because we only selected MeSH terms for keywords to aid in indexing in PubMed/MEDLINE. It could certainly be used as a keyword.
2) Discussion: The discussion seems to blend two issues: list kinds of reasons for discrepancies and analyse the discrepancies in the examples. While both are important, they should be treated separately. E.g. analyse (methodologically) the results and then conclude the observed and potential kinds of reasons (local practice variations, terminologies, scope etc.)

AUTHORS’ NOTE: We revised the paragraph at the bottom of Page 14 to better segregate our methodological analysis of the results from the exploration of the discrepancies that contributed to the discordance between the two sets of output. We now summarize the results of our adjustment for bias and prevalence, then we list the four areas of discrepancies.

3) Discussion: What do you mean by the chief limitation is the "lack of a gold standards for assessing the correctness of decision support systems"? Yes, medical correctness is laborious to assess, but necessary if this is the goal. But is this the goal of *your* work? Or is it the comparison of two systems - for which the lack is not a chief limitation? My impression: the latter.

AUTHORS’ NOTE: We concur. Therefore we have removed this paragraph.

4) Conclusion: You state "future efforts ... possibly with more complex rule logic": do you consider this a limitation of your work? While you raise the point, i.e. you consider it important, you to not discuss it or give the reader a hint on the possible effect: can it be expected that the CDSS differ more? Have you some indications from preliminary work?
=> perhaps move this to limitations

AUTHORS’ NOTE: Greater complexity would not necessarily affect the CDSS, except with more complexity comes greater opportunity for difference in implementation schemes (or greater difference of opinion when it comes to clinical expertise). We have moved this paragraph from the Conclusion to the Limitations because the salient point here is that these 11 rules are rather plain when compared to many existing guidelines.

5) Conclusion: While the topic of our research is important, there seems to be a gap between the immediate findings of your study and your conclusion: Even if both systems had 100% accordance, there is required more until "cloud-based CDS provides valuable advice...around the world".
=> reconsider including recommendations for future research also by others (not only your hope to focus or the potential pause to reconsider your work)

AUTHORS’ NOTE: Agreed. We have expanded in the conclusion on other R&D efforts in CDS that would advance not only the CDSC but all institutions and nations seeking to provide CDS services to clinical users. See pages 19-20.

Minor
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* p21 Reference 1: "[1.
* p27 Table 4: row 1 cell "95%..": hyphen is shorter than below

AUTHORS’ NOTE: These items have been addressed.

Reviewer 2
The authors assess the degree of agreement between decision support reminders originating from the cloud and a local CDS. They find substantial agreement. The study is well done and limitations are appropriately considered on pages 13 and 14. The authors could perhaps add more depth to the discussion. They raise the important issue of a universal CDS (in the cloud) juxtaposed against a local CDS. The question is to what extent 'universal' knowledge should be adapted to local practices (because of nature of patient population and local work practices). A similar discussion concerns the question how medical guidelines should and can be localized. Studies have shown that clinical guidelines advanced by national or international professional bodies are never implemented as intended, but adapted to local habits. The authors raise especially the problems of local resources and costs of configuring decision rules. I can imagine that the cloud approach could be very valuable to small and under resourced hospitals. I suggest to expand on what I see as an important contribution, namely how do local practices (embodied in rules) relate to the universal character of rules stored in the cloud.

AUTHORS' NOTE: Your comments are encouraging and inspired three new paragraphs at the end of the Discussion section on pages 17-18. It is here that we expand on our discussion regarding the juxtaposition of local versus cloud-based CDS. We drive home the salient points to articulate in your critique. We agree that expanding on these ideas strengthens the paper. Thank you.

We hope the editors and reviewers now find the manuscript ready for publication.

Sincerely,
Brian E. Dixon on behalf of all the authors