Author’s response to reviews

Title: Utilizing patient data from the Veterans Administration electronic health record to support Web-based clinical decision support: Informatics challenges and issues from three clinical domains

Authors:

Nallakkandi Rajeevan (n.rajeevan@yale.edu)
Kristina Niehoff (Kristina.niehoff2@va.gov)
Peter Charpentier (peter.charpentier@yale.edu)
Forrest Levin (Woody.Levin@va.gov)
Amy Justice (amy.justice2@va.gov)
Cynthia Brandt (cynthia.brandt@yale.edu)
Terri Fried (Terri.Fried@va.gov)
Perry Miller (Perry.Miller@va.gov)

Version: 1 Date: 02 Jun 2017

Author’s response to reviews:

Response to Reviewer 2: MIDM-D-16-00185

Sincere thanks for reviewing our manuscript and the reviewers’ comments. We are very sorry that the revision took more time than expected and thanks for extending the deadline for re-
submission. The reviewers’ comments were very detailed and helpful for us. We have made major revision of the manuscript and believe we answered most the concerns of reviewer #2 and hope this revision be accepted for publication in the Journal of BMC Medical Informatics & Decision Making.

Below are the responses to specific comments by reviewer #2:

1. This article reports on an important topic - and could be useful. However, the range of interested audience is limited (VA) and little is provided regarding generalizability in the scientific sense. The article was a bit hard to read, often redundant and perhaps not an accurate expression of the VA research environment as many tools commonly in use were not mentioned.

This paper reports on the experience on developing three web based clinical decision support (CDS) systems within the VA EHR, currently one of the largest electronic health record systems. We encountered many shortcomings of the current system that required careful and extensive problem solving tasks. We believe that other researchers developing such applications as well as those using the VA EHR would benefit from what we have described in this paper. The paper has been completely revised and rewritten. Some of the tools available to VA researchers (e.g. VINCI) are described and reference to all the tools from VistA is included.

2. The inclusion of 3 different projects is useful and adds some diversity to the paper. However, the authors did very little to show how this work added value to the research world. What other tools are in use for extracting and manipulating data? What is known and not known? How does their experience relate to the big picture issues?

The revised paper now includes descriptions of some of the tools (e.g. VINCI and Clinical Reminders) mentioned in the reviewer’s comment and for other tools we have provided a link accessible from outside the VA. In the paper, we address some of the deficiencies in the data from VistA that other researchers might also experience.
3. There are many tools, software and approaches in the VA and much of it has been included in research reports and are certainly available to researchers. Hence, it is difficult to get a sense of the nature of their specific experience except from a narrow scope and time slot. For example, no mention is made of Online analytical processing (OLAP) for VA data. Nor did they talk about the DSS national data sets, VINCI, or ProClarity desktops, just to name a few of the VA tools for handling big datasets. Even a dull description of the Clinical Reminder software would have been useful as it is well integrated into CPRS and often used for CDS. Their work seems somewhat local and a bit outdated. The VA Financial and Clinical DataMart overall includes many aggregated datasets along disease registry formats as well as person-level data that merges financial, billing and clinical data. These datasets can be used with a web-based software tool. It would have been very helpful if the authors had framed their work in this larger narrative. It would have also been important to include something about the VA’s future focus and plans. Otherwise, this article is basically outdated before it is published.

The revised paper now includes descriptions of some of the tools (e.g. VINCI and Clinical Reminders) mentioned in the reviewer’s comment and for other tools we have provided a link accessible from outside the VA. Though this paper details how the three applications accessed VA aggregate data from VistA and CDW using web service and SQL queries, it also describes in detail how the deficiencies in the available data (e.g. determining drug class from medication data) was addressed. For example, we describe how from the name and sig fields of a drug we matched it to one in the formulary table. Ideally, this matching should have been done at the source (e.g. in VistA), we believe, it would take a while for this to happen.

4. The methods described were more in the line of examples and a real summary of all the technical challenges they encountered. Solutions to these challenges seemed to focus on regular expression extractions and clinician data input. It was not clear in their descriptions if these were effective (did the clinicians enter in data?) What did they do with the 10% error rate?

One of the main challenges we encountered was in deducing the dose, schedule, and the class of drugs from the web service data fields. As described in the paper these fields are sometimes left blank and need to be extracted from either the name or sig fields. For the TRIM application, it is essential that the class of the drug be known. We obtain the drug class by matching the drug name in fiduciary table. If this matching was not possible, we looked this up in a local table that was previously populated manually each time a problem drug was encountered. This process improved the error rate over time. As an informatics solution, these field must have been filled in
at the source of data (VistA or CDW). Currently, however, we have to rely on ad hoc methods as described in the paper.

5. The writing was a bit redundant and the overall paper could use another review. It might be easier to summarize according to problem types and not according to the intervention. The use of acronyms so often was distracting (had to go down to the bottom of the paper to see what they were and I did not know that the first time through).

The paper is now completely revised and rewritten. The expansion for Abbreviations are now included when it is first used.