Reviewer’s report

Title: Health Timeline: An Insight-based Study of a Timeline Visualization of Clinical Data

Version: 0 Date: 17 Sep 2018

Reviewer: Thomas Reese

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This was an interesting analysis that evaluated a data visualization (Health Timeline) display with Insight methodology. The visualization organizes information along a timeline. The comparison was between a graphical visualization and a tabular format presentation. Five psychiatrists participated in 10 assessments. Overall, there were several missing and questionable aspects of the paper.

Major comments:

1. Goal 1 states, "By applying the methodology, we can determine the degree to which the visualization assists clinicians to understand the clinical data." From the perspective of applying the Insight methodology to a realistic novel use case, there are limitations to the performed analysis.

   * It is suspect that the primary significant finding is, perhaps, the most susceptible to bias (insight score). The manuscript lacks information on how coding objectivity was maintained. Suggest adding information on insight coding (e.g., independently conducted, validated by subject matter experts). Suggest adding information on how insight classification relates to clinical impact. For example, one of the highest rated insights states, "and developed comorbid diabetes." Why does this statement reflect clinician understanding and an impactful insight?

   * The authors mention a couple well-known timeline visualizations (e.g., LifeLines, LifeFlow); however, it is difficult to understand how Health Timeline is unique or amenable to this type of evaluation. Suggest adding design rationale for Health Timeline features. Suggest adding information on how Health Timeline builds from these other displays (e.g., LifeLines). Suggest adding justification on how timeline features and insights gained are analogous to those observed in the Bioinformatics context.

2. Goal 2 states, "To document the process of applying the methodology in the context of clinical data and assess the effectiveness of the visualization in the decision-making process." From the perspective of analyzing and documenting the impact of the visualization on clinical decision-making, the methods have limitations.
The title states "Clinical Data," but on Page 6, Lines 18-28, it appears the data source administrative (i.e., Pharmaceutical Benefit claims and Medicare Benefits Scheme claims). Do psychiatrists routinely sort through administrative data for insights? How does this mimic a "real-world" environment? How do the insights impact decision-making? Suggest adding information on how the task context is clinically relevant. Suggest adding limitations to the Discussion section.

The authors and other researchers have mentioned a key aspect of visualizations is interaction with the display to gain insights. Page 6, Lines 44 and 45 state, "The psychiatrist's observations during the assessment sessions were recorded on an answering machine over a phone connection." How did this procedure document visualization display interaction?

Rationale for selecting patient cases is lacking. Where the patients selected for profile complexity or representativeness? Where the same patient cases used for both displays? How was sample size determined? Was the display presentation order controlled?

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

No

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.

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