Author's response to reviews

Title: The Impact of EHR and HIE on Reducing Avoidable Admissions: Controlling Main Differential Diagnoses

Authors:

Ofir Ben-Assuli (ofir.benassuli@gmail.com)
Itamar Shabtai (itamar@colman.ac.il)
Moshe Leshno (leshnom@post.tau.ac.il)

Version: 3 Date: 6 January 2013

Author's response to reviews: see over
Cover Letter to Editor-In-Chief

Dear Mr. Adrian Aldcroft,

We would like to thank you and the reviewers, Prof. Chatzoglou and Prof. Rodrigues, for your interest in our work and for your efforts to promote the necessary modifications. This letter details the changes made to the manuscript in response to the reviewers' comments.

Responses to comments made by Prof. Prodromos Chatzoglou:

We would like to thank Prof. Chatzoglou for the approval of our work, and thanks for the compliments.

There were two minor comments in this review:

Regarding the discussion section - "The discussion section could be expanded. Managerial implications should have been considered."

Our Response: Regarding the discussion section, we expanded the section by elaborating on managerial and organizational aspects that derived from the study results (on pages 11-12). Specifically, we tried to discuss clinical and administrative implications of using EHR and HIE networks, as well as the benefits from interoperability.

The presentation of technical and human characteristics of the EHR IS – "Also, no information is provided as far as the technical (characteristics of the EHR used), human (users characteristics) and process/access (time available to access, who/how each user is using the info provided, who/how new info is entered into the system, etc) issues involved."

As for the issue of a more detailed presentation of technical and human characteristics of the EHR IS, we added a brief explanation of the research field and target population (in the 'Method' section, on pages 6-7) which include a description of the main characteristics of the EHR and HIE network that was adopted by the HMO as well as technical data about the system deployment, type of data, users etc.

Responses to comments made by Prof. Pedro Pereira Rodrigues:

We would like to thank Dr. Rodrigues for the thorough review of our work. The following lists our response to the comments (by their numbers):

C1: Thanks for the compliment. We tried to continue to write the paper with the same style.
C2: We added much more content that belongs to the background to 'Background' section from the other parts of the paper. Consequently, the paper seems more organized than before. We thank the reviewer for this comment.

C3: We expanded the 'Method' section in the abstract to include a brief explanation on what log-files are and the way they are being used.

C4: A general description of the research question and hypotheses has been added to the abstract.

C5: We rephrased the results section of the abstract, making it more explicitly related to the statistical procedures used. We also changed the 'Method' section in the abstract to express the connection of it to the research question.

C6: We thank the reviewer for this important issue. The description of the HMO and the EHR IS has been moved from the 'Background' section to the 'Method' section, where it is available under "Research field and the target population" (page 6). Certain parts of it were also moved to the limitations section ("Research Limitations and Future Research" on page 12) and to the 'Background' section (page 3). In addition, some parts of the dependent variables description were moved to the hypotheses paragraph in the 'Background' section (pages 5-6). Consequently, there are no references left in the 'Method' section, as requested.

C7: Firstly, the research question and the research hypotheses were merged into one section as requested. Secondly, the citations and references from the beginning of these sections ("Research Question and Research Hypotheses") were moved to the later parts of the 'Background' section.

C8: Indeed, we couldn't tell the raised assumption from the corrected admissions. However, we moderated our assumption and we also gave some references to works that made similar assumptions or used quite similar scales (on page 4 at the 'Background' section). We also declared it as a primary limitation in the 'Research Limitations and Future Research' section (page 12) starting with the sentence "First, in this analysis we were not able to differentiate justified from unjustified admissions".

C9: This is indeed important information that we mistakenly left out. The main diagnoses were selected in advance. This is now clearly stated in the article (page 6) – "These frequent diagnoses were chosen – prior to the data-analysis – by a panel of senior physicians in cooperation with the main HMO".

C10: Firstly, the 'Method' section was rewritten in order to resolve the mentioned problems, and among them the absence of a definition for log-files. In addition, a basic definition of log-files has been added (page 3) to the 'Background' section. Consequently, several references have been added to the paper or better elaborated (Andrews, 1998; Vest et al., 2011; Yen and Zhao, 2012).
C11: First, following to the previous point, a brief explanation of log-files and their characteristics has been inserted in paragraphs 3-4 of the 'Background' section (page 3). Thus, the part in the 'Method' section regarding log-files (under "research method") has been truncated. Secondly, regarding the space issues, we revised our explanation about the observation wards in Israeli hospitals on page 8 ("Only admissions from an ED to a specific hospital department were recorded and included. In addition, similar to many EDs around the world, hospitals in Israel maintain observation wards in which patients are supervised for a period of 12-24 hours. This period of observation was not included in the calculations"). We also added a brief description of this option in the 'Background' section (page 4).

C12: We changed completely the 'Method' section by providing more detailed explanation regarding the research field and the target population.

C13: "A Closely related condition" is defined as a condition that clinically resembles the main complaint/diagnosis which led to the previous admission. This explanation has also been added to the article (page 7, under "Readmission within seven days").

C14-15: The segments were moved to the 'Background' section, prior to the presentation of their respective hypotheses.

C16: This segment was moved to the 'Background' section, and added to the paragraph discussing information technology in the medical domain.

C17: The coding was removed from the variables section, and added to the footnote at the bottom of the regression tables.

C18: The missing details in the 'Method' section were filled in including the description of the data and the measures used in the study (under the sub-section 'The research method').

C19: We revised the 'Results' section according to this comment, and now it does not include the methodology's content.

C20: We added more information regarding the descriptive statistics to Table 2 including the number of patients, the number of readmissions, the number of single-day admissions and etc. Following other comments, we described the details of number of clinicians, number of physicians, the number of hospitals, details on the HMO and the chosen IS, as part of the description of the 'Research field and the target population' (on page 6).

C21: We accept the reviewer's notion of the figures being unnecessary. They have been removed.

C22: We tried to avoid presenting the results straight in the text without reference to a specific table.

C23: Thank you very much for bringing this to our attention. We clarify now in the
paper (on page 8 at the beginning of the 'Results' section) that all presented statistical analyses were consistently made on the admitted patients.

C24: All the tables in the manuscript have been reformatted into three-line tables.

C25: The column titled "Total" has been moved to the right-hand side of the table.

C26, C28: We revised Table 2 according to these two remarks regarding the continuous variables. It now includes the Median and the Quartiles in addition to the means.

C27: In light of this comment, an explicit explanation had been added to the footnote at the bottom of this table (Table 2). In fact the whole table was revised in order to be both more readable and informative.

C28: See the answer at comment #26 above.

C29: The comparison of HMOs was done for reasons of information gathering in pursuing a better understanding of the study population. It is not mentioned to give causality conclusions on the HMOs. We added this clarification in the presentation of Table 2 results on page 8 (on the 'Results' section). Moreover, in order to make sure that the findings cannot be partially accounted for by differences between HMOs, the HMO was added to the regression analysis as a factor.

C30: The mentioned qualifier was replaced with a more objective, descriptive one-"substantial".

C31: We added a footnote explaining the requested missing technique for the calculated percentages (on the bottom of Table 2: "The percentages in the Table were calculated out of the total number of admissions. For instance, the percentage of readmissions when medical history was viewed for all DDs: 4.1% is gained as consequence of dividing the number of Readmissions when medical history was viewed (2956) with the total number of admissions in which medical history was viewed (72,689), See at Table 2. All similar percentages were calculated similarly"). We hope it is better clarified now.

C32: We added in Tables 3-4 the p-value in the case when it was not lower than 0.001, as requested, and in addition to the existing information and signs.

C33: The tables have been revised to include only the odd ratios.

C34: The significance levels in each table entry are now in asterisks. The table footnote has been updated accordingly.

C35: We tried to elaborate more on the confounding factors during the whole paper and to share more details on these factors.
C36: The statement regarding the ethical approval (page 8) was revised to include more required details. In addition, as for the data anonymity, the log files that we used for this study didn't contain any personal details on the patients including the patient id. This field was hushed before we received the file so it was anonymized (This sentence was also added to page 8).

We hope that the revised version of the manuscript is now suitable for publication in your journal.

Sincerely,

The authors