

## **Author's response to reviews**

**Title:** Development of a minimization instrument for allocation of a hospital-level performance improvement intervention to reduce waiting times in Ontario Emergency Departments.

### **Authors:**

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**Author's response to reviews:** see over

Martin Eccles,  
Co-Editor in Chief  
Implementation Science

March 20, 2009

**RE: Development of a minimization instrument for allocation of a hospital-level performance improvement intervention to reduce waiting times in Ontario Emergency Departments**

Dear Mr. Eccles,

We would like to thank the editor and referees for their attention to the above named manuscript. We have addressed each point in the sections below.

**Referee #1:**

1. Could some additional description be added on the 4-stage framework in the methods section? (eg who developed the framework; what the setting was)

*We agree that a short description of the 4-stage framework developed by Golden (2006) is helpful; and have provided a sentence on page 7 of the revised manuscript.*

2. Table 1 summarizes the candidate factors but could all the original 33 factors be listed? A full list might be useful for investigators in other contexts.

*We feel that a listing of the 33 original indicators would be a repetitive and cumbersome table within the manuscript, which is why we developed Table 1 to synthesize the themes encompassed by candidate factors. However, we have provided this table as an appendix, and recommend that the journal provide this in the online-version of the publication should the editor also agree.*

3. What was the process for selecting volume and geographic region as the demographic minimization variables?

*The allocation method described in the manuscript aims to use Emergency Department Volume and Geographic region as stratification variables. Both of these factors are known to be highly predictive of Emergency Department length of stay (ED-LOS) We have cited relevant references (page 8) and updated the reference list accordingly.*

4. In round 1, it was not clearly described how the panelists made the judgment on whether the factors were correlated with the demographic variables – was it just a rating scale?

*Panelists rated the degree to which each candidate factor was correlated with the stratification variables based on their expertise and knowledge. The response scale for panelists was: High, Low or Unsure. We have specified this rating scheme on page 8 of the revised manuscript.*

5. Were the panelists roughly the same people the 1st (n=19) and 2nd (n=21) rounds? Please clarify in text.

*19 of the panelists were the same in both survey rounds. In Round 2, two panelists were added to include an international perspective. We have clarified this point on page 10 of the revised manuscript.*

6. There is no information given in the paper about how each of the 4 factors was to be scored for use in a minimization algorithm (aside from grouped into low and high). This is important – if the factors cannot be adequately categorized by the centres in the study then they are useless as minimization factors.

*On page 12 we state that “Each factor has been defined in the form of a question with a 9-level response scale. Responses from volunteering hospitals will be assessed for variance and grouped into two levels (0 ‘Low’ and 1 ‘Moderate/High’) accordingly for evaluation in the minimization algorithm.” The hospital CEO responding to the minimization questions will use a 9-level Likert scale. As minimization requires dichotomous or categorical variables versus ordinal, we will review the results to determine the appropriate cut-off in each distribution for each factor and group results appropriately to capture site-to-site variability.*

7. Table 2 – the “mean” column should be to 1 decimal place.

*We have adjusted the “mean” column in Table 2 to reflect original figures with 1-decimal place.*

8. p10 Discussion 1st Paragraph – this is not a published example of a minimization algorithm (none have been randomized in this manuscript), rather it is a structured approach to identifying factors to be used in such an algorithm. Please amend.

*We have edited the sentence.*

9. Related to comment 6 above – I wonder if the authors might want to put in a comment that some piloting of the factors before use in a trial would be prudent? If there is little variance in the identified factors in the trial centres then it is not worthwhile using them as factors.

*We agree, that researchers should be advised to pilot these factors before use in a trial; and have provided a sentence to this effect in the paragraph on limitations (page 14). Further to this point, since we submitted this manuscript we were provided the opportunity to pilot test the instrument among a small number (n=6) of CEOs from hospitals selected to pilot the ED-PIP intervention. We have added into the revision the results from the pilot sites, but not*

*altering the focus of the paper given the small number of sites involved. Nonetheless, we feel the results do demonstrate variability between hospitals, as we expected. We have concisely updated the methods (page 10), results (page 11) and discussion sections (page 13) of the paper in this regard.*

10. Abstract (2nd sentence) – the survey instrument is not part of the minimization algorithm, it is part of the identification of factors to be used in a minimization algorithm.

*We have edited the sentence.*

11. Consistent use of word “factors” – eg page 4 last paragraph uses “covariates”

*We have replaced the word ‘covariates’ on page 4 with ‘factors’ to maintain consistency of terms.*

## **Referee #2:**

1. The authors have attempted to develop a structured panel process that seems a bit convoluted and somewhat disjointed in its explanation. I need to understand why they did not rely on the Delphi or modified Delphi process, a very well-defined and cited method for performing the same exercise as they attempting here.

*We agree with this important point, which is related to Referee #1’s comment #8 above. The modified-Delphi process is the method for that we are reporting. Our methodology is similar to our previous modified-Delphi processes used to develop Emergency Department quality of care indicators for adults and children (Lindsay et al, 2002; Guttman et al, 2006). The term ‘structured panel process’ has been used previously in the description of the modified-Delphi method, leading to some confusion with terminology. In order to more clearly describe our method, we have described the study method/design as a modified-Delphi and nominal group process (page 8-10); and refer to the design as a ‘structured panel process’ only when referring more generally to the study method.*

2. On page 8 of the paper, the authors indicate that highly correlated factors were excluded from consideration. “Highly correlated” was not well defined. How was correlation defined with an ordinal allocation factor?

*See response #4 to Referee #1.*

3. As mentioned on page 10, there were missing responses in the first and second rounds. First, why should there have been a failure to respond from pre-chosen panelists, who presumably agreed to participate in the first place. How did the authors accommodate the missing responses? Were they concerned at all about non-response bias?

*We were not concerned with a small number of non-respondents. Even in small deliberately selected panels, some participants may agree to take part and yet be unable to do so when the time comes. This is especially true with the senior level scientists and health system decision makers included in this process. We nonetheless facilitated multiple reminders and e-mails over an extended data collection period (1-month), but were unable to achieve a 100%*

*response rate. Missing responses were therefore excluded from all quantitative analyses. We are not concerned with response bias as there were an equal number of research scientists (n=3) and health system decision makers (n=3) among the non-response groups.*

4. The final four minimization factors listed in Table 3 will need to be categorized in order to be used in this randomization methodology. How do the authors intend to do that?

*See response #6 to Referee #1.*

5. As the method of minimization is not well understood by many of the readers of his journal, it would be important for the authors to give at least a brief introduction to this methodology since it provides some of the rationale for the current paper.

*We see the value in including this information to the reader, which is why we focus our second paragraph in the Introduction on page 1 to describing the method of minimization in the context of Dynamic Randomization. We believe this section is clearly written and provides a succinct description and appropriate citations (1 through 8) that document the original theorists, mathematical foundations and utilization of the method.*

We hope the revised version is satisfactory. We have taken the opportunity to make minor grammatical changes to the text elsewhere. All changes in the revised manuscript are tracked using Track Changes. We look forward to your response at your earliest convenience.

Thank you,

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