Author's response to reviews

Title: How does lean work in emergency care? A case study of a lean-inspired intervention at the Astrid Lindgren Children's Hospital, Stockholm, Sweden.

Authors:

Pamela Mazzocato (pamela.mazzocato@ki.se)
Richard J Holden (richard.holden@vanderbilt.edu)
Mats Brommels (mats.brommels@ki.se)
Håkan Aronsson (hakan.aronsson@liu.se)
Ulrika Bäckman (ulrika.backman@karolinska.se)
Mattias Elg (mattias.elg@liu.se)
Johan Thor (johan.thor@ki.se)

Version: 9 Date: 22 December 2011

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

We would like to thank you for giving us the chance to develop the paper further. Your comments identified a number of points which we have worked to improve.

Below we respond to your comments and indicate how we have changed the manuscript.

Comments from Referee 1

Comment

The flow of the report is confusing.

- We have reworked the paper to improve the flow. We moved the description of the setting to the main text, and moved it to the beginning of the methods section. We have reworked the text, both in the methods and in the results section, to clarify the structure of the paper. The results section is now organized in the three parts: the results of quantitative analysis, the case description, and the case analysis.

Comment

The report describes the implementation of a Lean influenced redesign program in an emergency department. The authors spend some time on what they describe as a conceptual framework. It is not at all clear that this framework was adopted by the participants in the redesign program itself. Rather, it is the framework adopted by authors to guide their interview component. It represents one view of Lean thinking, but one view only, and a view that is not at all adapted to healthcare.

- In the methods section (last paragraph in “study design and conceptual framework”) we added text to explain that the principles were not used explicitly by the implementers at the hospital to design the lean intervention. Rather, they formed the analytic framework for this study. There is no universally accepted definition of Lean in healthcare. While Spear and Bowen’s principles were originally developed from studies of the Toyota Production System, we deemed them to provide a useful analytic framework as they describe how lean works, rather than prescribing specific practices or steps to take to implement lean.

Comment

I think the article needs to be clearly separated into two components.

- We have reworked the text, as outlined above.
Firstly, the article needs to clearly describe the program of work at the Karolinska, giving a brief discussion of the context of the emergency department within the body of the text, not as a table.

- We moved the description of the context from the table to the body of the text.

Comment

The description of the emergency department pre and post is incomplete. It is not clear how decisions were made on the priority given to patient reviews- were patients seen on a first come first seen basis, was a priority system used (eg a triage score) or what? Was the priority system for queuing to be seen changed after the Lean process- this needs to be better specified.

- In the case description we added the following text: “Patients were prioritized based on a 1-5 scale triage score. This triage system had been locally developed to fit the characteristics and needs of pediatric patients, and was inspired by a triage system in use in Sweden named ADAPT (Adaptive Process Triage)”

- Later in the case description we now explain that the priority system was not changed after the lean intervention.

Comment

It might be helpful for the authors to read some of the existing accounts of Lean implementation within Emergency Departments, rather than rely on summaries in review articles, to get an idea of the issues.

- The authors have read most of the existing accounts of Lean implementation, having authored, among themselves, two of the recent literature reviews. We originally kept most of the original sources out of the paper in order to avoid excessive referencing. In the discussion, we now relate the changes in practice we found in the studied A&E to those previously reported in the literature.

Comment

The numerical analysis is incomplete. The Karolinska has an admission rate of 17%- the analysis needs to subdivide the 4 hour related outcomes into patients discharged directly from the department, and patients admitted from the emergency department into the body of the hospital, to get a clear idea of where the impact of the improvement was best felt.

- This is a useful idea for further analysis. It was not employed by the case organization (which focused, during the study period, on improving patient flow at the A&E) and we do not have access to such data. We have added a remark to this effect in our discussion of the study limitations.

Comment
Then only in the discussion should the authors refer to their personal views about Lean, and then sparingly.

- We have addressed our study question in a qualitative analysis, carried out according to the methodology described by Yin. We have reworked the text in the methods section to explicate that the case analysis aimed to explain, through the lenses of the four principles, how the intervention worked in the local context as well as to identify its strengths and weaknesses. We first categorized the lean-inspired changes based on Spear and Bowen’s principles. Second, taking the explanation building approach described by Yin, we compared and adapted these principles (i.e. theoretical statements) based on our qualitative data. This approach allowed us to offer one interpretation of how and why lean worked in a pediatric A&E context.

We are not unique in taking this approach. Similar approaches to case analysis can be found in articles published by BMC Health Services Research:


- In the methodological considerations section, we stress the need for further testing of these explanations in multiple studies in order to confirm, or modify, them.

Comment

Assessing an intervention against a theoretical set of views that come directly from industry, without any kind of analysis of the modifications necessary to adapt those principles, is a discussion point, and should be seen clearly as such.

- There is no universally accepted definition of Lean in healthcare. We picked Spear and Bowen’s framework because we found it useful as a guide for our interpretation of the lean-inspired changes in the case setting. In the methods/study design section we have added a sentence to explain the rationale for choosing this framework.

- Inspired by this comment, we have also re-worked the case analysis around the four principles, including the analysis of what may have prevented even greater improvement. We believe this has improved our analysis as we were able to more clearly illustrate some contextual challenges to how lean works in healthcare.
Comments from Referee 2

Comment

Consider a limitations discussion and discussion of what the authors believe is novel about this report

- Limitations are discussed under the heading “methodological considerations”.

- We have reworked the discussion to clarify what in our view is the main contribution of this manuscript: “Many articles and books have appeared all trying to reconstruct which principles really explain Toyota’s high performance levels. In contrast, contemporary research into lean healthcare mostly addresses which tools or practices worked, rather than developing a more general understanding of how or why lean works. Drawing on Spear and Bowen’s principles, this study adds to the current literature by explaining how lean worked in one specific paediatric A&E context based on Spear and Bowen’s lean principles.”