Author's response to reviews

**Title:** International benchmarking of specialty hospitals. A series of case studies on comprehensive cancer centres.

**Authors:**

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**Author's response to reviews:** see over
**Rebuttal:** MS: 7893510483207319

**Paper title:** International benchmarking of specialty hospitals. A series of case studies on comprehensive cancer centres.

Authors: WAM van Lent\textsuperscript{A}, RD de Beer\textsuperscript{B}, WH van Harten\textsuperscript{AC}

Dear Editor,

Enclosed, our response to the comments of the referees considering our manuscript (MS: 7893510483207319, revised version submitted 17-03-2010).

We adjusted the paper upon the remarks of reviewer nr 1 as reviewer nr 2 was satisfied with the earlier revision. A detailed point-by-point response is given below.

In this rebuttal, we consecutively discuss how we responded to the remarks of:

1. Reviewer 1
2. Editorial request:

We cite the reviewers in Arial 11 and in Italics, then we give our response to the remarks (Arial 11) and adapted text is presented in (Arial 10 double spaced and in Italics).

In the revised manuscript version we used the track changes function.

Yours Sincerely,

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Reviewer 1

Reviewer’s report
Title: International benchmarking of specialty hospitals. A series of case studies on comprehensive cancer centres.
Version: 3 Date: 21 April 2010
Reviewer: Klaske Wynia

Reviewer’s report:
The reviewer wrote:
In general, this paper improved compared to my first review, but still needs major revisions before it is possible to decide on acceptance or rejection. Therefore I will give suggestions for improvements.

In general: I would suggest the author to look for more support on writing a research paper before submitting this paper again.

Our response:
Various textbooks and papers on research on organizational aspects show that the socio-dynamic character and many, sometimes hardly comparable factors render this type of research into a challenge. Operations management tradition relies very much on single case studies, whereas this type of evidence is looked upon as rather meager in the medical domain. As controlled studies are very difficult to organize in studying organizational interventions, a next step is to embark on series of case studies, which from the medical point of view might still be considered insufficient but represent a rigour in OM literature that is not yet very common (Øvretveit 19981, Van Harten 20012). With this paper we hope to contribute to the knowledge of thoroughly comparing organizational aspects, possibly as a basis for larger series.
The reviewer is correct that it is hard to fit this type of research into the usual medical paper format, but we hope to have adapted it in such a way that it sufficiently meets the expectations.

You wrote:
Abstract
1 The Methods section is incomplete and should contain information on the design of the study, methods for data collection and measurements.
2 The Results section presents information concerning methodology aspects.

Our response
1. We added the requested information to the methods section of the abstract. The original text was:

Methods: Three international benchmarking case studies were conducted in three comprehensive cancer centres (CCC), three chemotherapy day units (CDU) and four radiotherapy departments.

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Methods: Three independent international benchmarking studies on operations management in cancer centres were conducted. The first study included three comprehensive cancer centres (CCC), three chemotherapy day units (CDU) were involved in the second study and four radiotherapy departments were included in the final study. Per multiple case study a research protocol was used to structure the benchmarking process. After reviewing the multiple case studies, the resulting description was used to study the research objectives.

2. In the results section of the abstract we moved the information about the methods. The original text was:

Results: Case study 1 concentrated on benchmarking operations management within CCCs. This resulted in general recommendations for the organizations involved and for the benchmarking process. In the other cases, the benchmarking process was further refined, and success factors were examined. In Case 2, we applied benchmarking to the CDU; together with lean management this led in one unit to a 24% increase in bed utilization and a 12% increase in productivity. In Case 3, we focused on the indicator development process. Two radiotherapy departments are currently working on the improvement of linear accelerator downtime and on the clinical trial inclusion process.

We also moved and integrated a part of the conclusions (We adapted existing …… were found) to the results section because this was indeed our answer to the research questions. The new text is:

Results: We adapted and evaluated existing benchmarking processes through formalizing stakeholder involvement and verifying the comparability of the partners. We also devised a framework to structure the indicators to produce a coherent indicator set and better improvement suggestions. Evaluating the feasibility of benchmarking as a tool to improve hospital processes lead to mixed results. Case study 1 resulted in general recommendations for the organizations involved. In case study 2, the combination of benchmarking and lean management led in one CDU to a 24% increase in bed utilization and a 12% increase in productivity. Three radiotherapy departments of case study 3, were considering implementing the recommendations.

Additionally, success factors, such as a well-defined and small project scope, partner selection based on clear criteria, stakeholder involvement, simple and well-structured indicators, analysis of both the
process and its results and, adapt the identified better working methods to the own setting, were found.

The reviewer wrote

Background
1 Has much improved.
2 I still miss a motivation for the growing interest in international benchmarking since 2000 as a consequence of the WHO report ‘Health systems: Improving Performance’.
3 On page 4 Second paragraph starting with ‘Searching PubMed ….’ is not relevant in this context. Text until The importance of indicator development in health care can be left out.
4 Also Table 1 is not relevant and can be left out.
5 The ‘Research relevance’ section (page 5) should be more comprehensive.
6 On page 5 the objectives of this paper are presented and on page 6 the research questions are presented. This is double, and one (page 5) should be left out.
7 The ‘International benchmarking ….’ (on page 5) is not relevant and should be left out or findings should be integrated in the text.

Our response
1. Thank you.
2. We were not sure what was meant with this comment, since the previous version included a reference to this report. We wanted to explain that the report fits in the trend to use benchmarking and that the report underlines the possibilities of especially international benchmarking.
   a. We changed the order of the paragraphs in the background section. The old second paragraph containing the reference the WHO report (p. 3 The comparison of health systems …… timelessness and efficiency [3]) is now the third paragraph (p3-4, Health services research (HSR) … improve their processes.)
   b. We changed the original second paragraph (p. 3-4 The comparison of health systems …… timelessness and efficiency [3]) into: Health services research (HSR) applied benchmarking mainly to identify best-practices for national health systems and treatments. The WHO World Health Report [7] concluded that although health status between countries was comparable, the healthcare costs differed considerably. Nevertheless, the ‘knowledge on the determinants of the health system performance, as distinct from understanding health status, remains very limited.’ This conclusion underlines the possibility in understanding international practices as an instrument to improve healthcare performance. International benchmarking helps to explain for instance efficiency differences in hospitals and it supports hospitals to improve their processes.
c. The rest of the background section was slightly changed to enable a better coherence between the paragraphs (see track changes on p 3,4,5)

3. We moved most of this text as suggested. The argument that research on benchmarking on operations management in hospitals is limited has not been removed because this shows the relevance for this paper. The new paragraph is (p4): Although international benchmarking on operations management may improve hospital processes, research on this subject is limited. It seems that so far most attention is given to the comparison of healthcare systems on a national level and to the development of indicators. The importance of indicator development is highlighted by Groene et al. [8] who found 11 national indicator development projects in a systematic review.

Since we all the information about a literature review was left out in this section, we rewrote the conclusion of this section (p4). New text:
We conclude that benchmarking as a tool to improve operations management in hospitals is not well described and possibly not well developed.

4. This table has been left out as suggested, the relevant content is integrated in the text. The new text is presented on page 5 second paragraph. The text is also presented below, remark 5, second paragraph (Benchmarking of …… success factors).

5. We changed the title of the research relevance and objectives into "Specialty hospitals in benchmarking" because this better reflects the contents. In addition to that, we moved a few sentences out of this text to make it more comprehensive. The new text is (p 4-5):

1.1 Specialty hospitals and benchmarking

In order to become more efficient, healthcare is also showing a trend towards specialization of hospitals (or their units). Schneider et al. describe specialty hospitals as hospitals ‘that treat patients with specific medical conditions or those in need of specific medical or surgical procedures [10]’. The number of specialty hospitals is increasing [10-12]. Porter, Herzlinger and Christensen [13-15] suggested that specialization improves the performance, because it results in a better organization of processes, improved patient satisfaction, more cost-effective treatments and better outcomes [13-15]. Most research involving specialty hospitals concentrates on the differences with general hospitals [10] whereas identifying optimal practices, especially regarding operations management, is seldom the topic of research.

Because specialty hospitals represent a trend, and the opinions about the added value are divided, more insight into the benchmarking process in specialty hospitals could be useful to study differences in organization and performance and the identification of optimal work procedures.
Benchmarking of operations management in specialty hospitals has not been frequently examined. By the end of 2009, we could find only 23 papers in PubMed about operations management in specialty hospitals, 6 of them concerning cancer centres. About half of the 23 papers turned out to be a mismatch with the research topic. Most of the relevant papers appeared to be non-scientific, mentioned just a few outcomes, and emphasized the experiences of the project members. Only four publications reported on a competitive benchmark for specialty hospitals, but none described benchmarking in an international setting, nor did any focus on the benchmarking process or the success factors.

6. The research objectives on p5 have been left out as suggested.
7. The text ‘International benchmarking…’ on page 5 has been integrated in the text. We felt that the paragraph could not be left out because this explains the unique character of our research. The new text is presented under remark 5, second paragraph (Benchmarking of …. The success factors).

The reviewer wrote

Methods section
1. The author explained why ‘case studies’ were used but did not explain what was meant with a case in this study. As a consequence, the sentence ‘The number of cases per case study’ is confusing.
2. Page 7: Paragraph label ‘Case study research methodology’. I would suggest ‘Case study research protocol’ as more appropriate in relation to the context of the paragraph.
3. In the final line of this paragraph the author reports about ‘an important distinction …’. What are the consequences of this distinction?
4. On page 8 ‘lessons learned’ are already reported by describing the added steps compared to the case before.

Our response
1. This sentence has been removed. We understand that the word case study caused confusion. We therefore use the term “multiple case study” to refer to any of the 3 independent benchmarking projects, we use “case” or “case study” to refer to the individual cases. The second paragraph in this section explains now carefully what the cases are. New text (p5-6):

2.1 Study design

International benchmarking with the objective to identify OM improvements in specialty hospitals is examined on the basis of three independent multiple case studies in comprehensive cancer centres. We used multiple case studies, because they are suitable for exploratory investigations and allow in-depth research. Each multiple case study consisted of international comprehensive
cancer centres (CCC) or departments within a CCC, as these may be representative for specialty hospitals operating in an internationally competitive environment. A comprehensive cancer centre means a (partly) tertiary hospital specializing in the treatment of oncology patients, that is involved in education and translational research.

Each multiple case study concerned a different hospital level: total hospital level, unit level and department level. Multiple case study 1 was limited to the comparison of operations management within CCCs. Three CCC’s were included. In study 2 a small project scope was defined to enable to go through the complete benchmarking process, including the translation of more optimal working procedures and the evaluation of the implemented changes. Three Chemotherapy day units (CDUs) were the cases for this study. In study 3 the scope was widened to a department, but the study was limited to the delivery of recommendations to the involved organizations. This study especially evaluated the involvement of internal stakeholders and the indicator development process. Radiotherapy departments were the cases of this study.

2. The text has been changed as suggested.
3. We changed the sentence (previous version p 7, An important distinction …) and explained the consequences of this distinction. New text (p 7): A distinction between HSR benchmarking and the approach taken in this paper was that our process focused on gaining insight into the organizational aspects, thus creating learning opportunities to improve performance. This research did not emphasize the development of extensively validated indicators or procedures to validate the comparability of organizations (for example on case mix).

4. The remark of the reviewer was not traceable to us. After reading the first remark about the results section we added information about the lessons learned to the methods section (p7, second paragraph under case study research protocol). New text: The benchmarking process used in each multiple case study differs on details as the lessons learned were integrated in the next multiple case study.

5. As the reviewer suggested we sought feedback on the writing style. We removed some remarks in the methods section because they did not belong there. We removed (p8, second paragraph):
During the benchmark it became apparent that not all indicators were as useful as expected. The development of indicators for case study 3 was most thoroughly done and will be published in a separate paper.

The reviewer wrote

Results section:
1. The author frequently reports ‘conclusions’ which is not appropriate for a results section. Obviously ‘lessons learned’ in a case study were integrated in the next case study. However, this method is not described in the method section.
2. For the ‘lessons learned’ the author should be more explicit in reporting and explaining in the proposed adjustments in the benchmark process. (response to question 2, page 10)
3. In general: results should be presented in the past tense.
4. Page 10: why are results described for case study 1 not reported in Table 4?
5. In general: the structure of the results section is confusing throughout the manuscript. Again I suggest the author to treat each case study as an independent study with different benchmark processes. By doing so the results of the three case studies can be integrated for each research question. By doing so:

The objectives for this paper should be (i) to present a process model for international benchmarking of operational performances by comprehensive cancer centres (or departments), and (ii) to give a description of success factors for international benchmarking in comprehensive cancer centres. Results can be reported for these both objectives.

Our response

1. The results section no longer uses the word conclusion. In the second paragraph of the case study research protocol section (methods p 7) we added the following sentence:

The benchmarking process used in each multiple case study differs on details as the lessons learned were integrated in the next multiple case study.

2. The answers on the research question about the benchmarking process (question 2 previous version, question 1 current version) contain more information about the lessons learned and the changes made in the benchmarking process. Per research question the results of the multiple case studies are discussed. This involves a major revision of the results section and can be found on p 9,10,11,12,13.

3. The changes have been made as requested.
4. The reviewer is right; some information was not reported in Table 4. This has been corrected, the results reported in the text are all presented in Table 3.
5. The following changes have been made:
   a. We also emphasized in the methods section (p 7) that we conducted independent multiple case studies. The section study design (p5,6) now explains the differences between the cases better. See this rebuttal, remark 1 about the methods section for the new text.
b. We changed the structure of the results section as suggested. Per research question the results from the cases are presented. As earlier described this resulted in a major restructuring of the results section on pages 9-13.

c. As we shuffled the text, some parts could be shortened.
   i. Previously we described extensively the verification process at the success factors of case 3. The new text about the verification of the comparability is:

   Since the CDUs found verification of their comparability useful, e.g. in respect of patient case mix treated and the services delivered, we included this as a new step in the benchmarking process (see Table 2, step 4). A self-made instrument was developed to test the comparability involved organizations. The case mix was examined with the ICD-9 coding system, the percentage of urgent patients and the duration of the treatments. The delivered services were examined based on the main techniques used for treatments. Table 4 shows that the patient case mix and services offered were similar.

   ii. Also a remark about the indicators (previous version, p13, Despite the efforts …… a reasonable period) was shortened to (p 11):

   The improved benchmarking process (see Table 2) resulted in better acceptance of the indicators, although it proved difficult to obtain all the requested data.

d. We changed the research objectives from three to two. The new questions are (p5):

   i. What is the most suitable process for benchmarking operations management in international comprehensive cancer centres or departments (benchmarking process) to improve hospitals?

   ii. What are the success factors for international benchmarking in comprehensive cancer centres (success factors)?

e. We changed the abstracts to include the new objectives. The new text is (p2):

   Background: Benchmarking is one of the methods used in business that is applied to hospitals to improve the management of their operations. International comparison between hospitals can explain performance differences. As there is a trend towards specialization of hospitals, this study examines the benchmarking process and the success factors of benchmarking in international specialized cancer centres.
The reviewer wrote

Conclusions:
1 This section should also report on strengths and limitations of the study, and elaborate on the implications of the conclusions for further research and clinical practice.
2 This section should not end with a reference to a table representing results!

Our response
1. We made the following changes.
   a. Research strengths are added to the Discussion section (p 16):

   To our knowledge this is the first attempt that examined international benchmarking on operations management in (speciality) hospitals. The approach we followed makes it possible to improve the structure of international benchmarking processes. This process in combination with the provided success factors may increase the chances that benchmarking results in improved operations management performance in specialty hospitals like comprehensive cancer centres.

   b. Although the original discussion section contained two comments on the research limitations we made the limitations more explicit and added information for further research. The new text is (p 16-17):

   A limitation is that our benchmarking process was only tested in three multiple case studies involving three to four cases. Involving larger series could be useful to further improve the validity of the benchmarking process. Furthermore, our multiple case studies were limited to cancer centres, but we presume that the benchmarking process is valid for other multidisciplinary specialty hospitals. Single specialty hospitals might be easier to compare. Further research is required to confirm this. As the benchmarking process seems more time consuming in an international setting as system differences add to the complexity, we suggest that the described process is for certain useful for benchmarking in a national or regional setting provided he objective is to identify relevant operations aspects into sufficient depth.
To our knowledge there is no accepted guideline or norm describing a complete indicator set for comparing the operations management performance in hospitals or hospital departments. Per multiple case study we defined an initial list of indicators, based on relevant literature and stakeholder feedback. Stakeholders provided feedback on the relevancy, measurability and comparability. As a result indicators were removed, adapted and sometimes added. A limitation of this approach is that more emphasis can be laid on the methodological quality of the indicators. However, combining the benchmarking process with a thorough and detailed process of indicator development could further improve the benchmarking, but will prove to be complex and demanding. In this way generic indicator sets on operations management could become available.

The developed indicator sets enabled the assessment of the operations management of specialty hospitals and generated suggestions for improvement. Collecting and interpreting data, however, has to be done carefully and must be based on the total indicator set as there is not (yet) one single best method to organize processes. For example a good performance by one indicator (utilization rate) is often associated with a negative effect on another indicator (long waiting times).

A limitation of the sampling method is that it remains uncertain whether the best practices within the sector have actually been included. Because information on best practices was not available, we used personal management contacts to select presumed good working methods. As data availability and comparability seems more frequently a problem in an international context, we recommend the use of international benchmarking only if comparable organizations are not available within the same country.

Although Gift and Mosel [3] stated that benchmarking is a continuous process, the cases were only benchmarked once. Recurrent measuring seems only useful if different
outcomes can be expected within short time frames, and the partners are ready for a long-term commitment.

c. The clinical relevance is included in the conclusions section, final paragraph, p17. 
This study generated more insight into the process of international benchmarking as a tool to improve operations management in specialty hospitals. All multiple case studies provided areas for improvement and multiple case study 2 presented the results of a successful improvement project based on international benchmarking. The provided method and the success factors can be used in international benchmarking projects on operations management in specialty hospitals.

2. We made the following changes:
   a. We replaced the answers to the research questions from the conclusions section to the discussion section (p 13-16, Based on our results …… practices in the organization)
   b. Success factor f was previously mentioned in the results section, as this is not a fact we moved it to this section. Table 6 was changed according to the changes in this section (p 26).
   c. We added more information to success factor e (p 15, A comparison of financial data ….. within a shorter time frame). This information was previously described at another place in the discussion section, but it belongs to the success factor to keep indicators simple.
   d. The new text of the conclusions section is:

This study generated more insight into the process of international benchmarking as a tool to improve operations management in specialty hospitals. All multiple case studies provided areas for improvement and multiple case study 2 presented the results of a successful improvement project based on international benchmarking. The provided method and the success factors can be used in international benchmarking projects on operations management in specialty hospitals.