Reviewer's report

Title: Functional mapping of hospitals by diagnosis-dominant case-mix analysis

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Reviewer: LYDIA KAPIRIRI

Reviewer's report:

General
The authors describe a method with a potential to inform resource re-allocation between different levels of health care. The method proposed is novel and according to the authors- has potential for providing useful indicators for the appropriate allocation of health care resources among different healthcare providers. Since many health care systems are struggling with cost containment- an approach that informs this process is definitely useful to health care providers.

The authors’ main premise for this project was that Japan compares poorly to the other OECD countries as far as efficiency of its health care system goes. They then provide a comprehensive description of their methods.

While the paper presents very interesting findings, and the Methods section is very well and comprehensively described, the paper could be improved.

Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)

Background
1.2. In the 2nd par. The authors state that Japan compares poorly to other OECD countries and specifies the specific areas where they fall short- specific indicators would be useful.

Objectives

2. While there is justification for the study, the study objectives- or the objectives of this manuscript can only be inferred but are not stated explicitly. The authors may consider stating these explicitly.

Results
1. The authors report three main findings
   • The mean RI, CI and DI from the selected diagnosis categories
   • The seven most common diseases in Japan
   • The comparison between the hospitals (Figure1)

Since all these are presented in one paragraph, it makes it difficult to do justice to either topics- which I found to be very interesting- and would be useful to a new reader.

The authors could consider separating (at least by the use of paragraphs) the sections and add a bit of detail on each point explored in the paper.

Specifically, the gist of the paper is Figure 1. However, there is a lot of interesting information lost in just describing what is presented in the figure. For example; More description of the RI, CI, and DI in each specific contest would be useful to include in the results section before presenting the synthesis…Since the results section is just 1 page- the authors have room for including more details which would make the paper easier to understand by a wider audience.

The discussion covers most of the results presented.
However, since in the introduction- one of the premises for this paper is the concern that Japan seems to have an inefficient health care system, I would have expected more discussion on how this method would improve RA- (It is kind of implied in the paragraph 2, Pg.10- in the discussion- but more discussion on how this could be effected would be useful.

In the first section, the authors point out that Japan spends 30% of its total health care budget on Major teaching hospitals-( which may be comparable to other countries (if not then this should be discussed). However in addition- the results seem to justify that expenditure since these hospitals receive the most
complex cases – Intuitively, the budget allocation seems intuitively acceptable. Is this inefficient? Is it one of the evidence of the inefficiencies in the Japan healthcare system? A discussion of these issues would be useful.

On Pg. 9, the “surmise” in the last sentence in this paragraph needs some more concrete backing - do they recommend or do the findings tie up with those from previous literature?

 Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

Background
1. In Par. 2 Pg. 10, the authors state that “…this case mix analysis highlights the potential for health care policy research on the allocation of healthcare resources, e.g. by investigating the introduction of a capitation method in the place of the current fee-for-service system…”

The authors definitely know the link between the two modes of healthcare financing and how the case-mix analysis would facilitate identification of more efficient approaches - however, this may not be obvious to a reader.

I missed the whole discussion on how this approach compares to other existing approaches. And a reflection on the potential “weaknesses”/shortfalls in the approach. Such a discussion would provide a balanced assessment of the approach.

 Discretionary Revisions (which the author can choose to ignore)

1. Some of the sentences are too long and would read better, and make the text more clear if they were divided e.g. the 2nd sentence in Par. 2 pg. 5. And in the par. Just before the methods section

Were the result’s section explicitly structured - the discussion would follow the same structure and it would make following the discussion much more easier.

What next?: Accept after minor essential revisions

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable

Statistical review: No

Declaration of competing interests:

'I declare that I have no competing interests'