Author's response to reviews

Title: Do decision support systems influence variation in prescription?

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Author's response to reviews:

Dear editors,

We are pleased that two out of three reviewers share the opinion that we improved our paper substantially and that the improved paper can be published. However, one of them still has some concerns. We will address these concerns as well as two remarks from one of the other reviewers point by point. Based on the comments of this reviewer we were able to improve our paper even further.

We hope that our revised manuscript and our reaction take away all concerns. We look forward to receiving your reply.

Yours sincerely, on behalf of all authors,
Judith D. de Jong

Our point by point reaction:

Marek Brabec
1) Make explicit over what index you are doing the summation on page 10.
Authors' response:
We changed the sentence on page 10: “The HHI was measured as #(a/b)2; where a is the number of times a specific drug was prescribed per diagnosis per GP and b is the total number of times any drug is prescribed for this diagnosis per GP. The HHI was measured for each drug prescribed per diagnosis per GP and these values were summed for all drugs prescribed per diagnosis per GP.”

2) Support the claim that the HHI is often used in health economics and more often used than the one suggested by the reviewer.
Authors’ response:
A search in Pubmed with the words “Hirschman-herfindahl health services research” gives 9 hits, while a search with the words “kullback-leibler health services research” does not give any hits. Therefore, we conclude that in our field
of research the HHI is more common than the Kullback-Leibler distance.

Ed Hammond

3) There is lack of information to clearly understand exactly what is being evaluated.

Authors’ response:

We agree with the reviewer that although content is a function of beliefs and judgement, the perception of the reader needs to be clarified. The reviewer suggests to change the title of the article into “Do decision support systems influence prescription?”. This title ignores the fact that our article is about variation in prescription. However, it is clear that the title is not clear for the reader. Therefore we removed the brackets from the title and changed it to “Do decision support systems influence variation in prescription”.

From the comments of the reviewer we understand that the subject of the article is not clear. The reviewer seems to be most interested in the DSS, where we are interested in variation in prescribing in relation to the DSS. This should be clear from the beginning and therefore we added a paragraph to the introduction (see question 4). We believe that this paragraph makes clear what this article is about and that the subject of variation in medical practice is important.

4) Does the DSS recommend a single drug or a set of drugs for a given problem? Does the (ATC) coding system identify a class or type of drug, or does it identify a specific drug?

Authors’ response:

On page 12 we wrote: “DSSs give recommendations for prescribing certain drugs. The DSS for prescribing by GPs that we studied advises several different drugs or recommends a stepwise treatment starting with one type of drug and changing that type of drug later on when necessary. We were not able to take stepwise use of different drugs into account in our definition of conformity to the advice of the DSS. As a consequence, variation can be generated.” The Anatomical Therapeutic Chemical (ATC) is a classification system in which drugs are divided into different groups according to the organ or system on which they act, and their chemical, pharmacological and therapeutic properties. The Anatomical Therapeutic Chemical Classification System is used for the classification of drugs. It is controlled by the WHO Collaborating Centre for Drug Statistics Methodology, and was first published in 1976. The ATC code identifies a type of drug; the code is based on the chemical/therapeutic/pharmacological subgroup. We added a reference: Anatomical Therapeutic Chemical (ATC) classification index. 1993. Oslo: WHO Collaborating Centre for Drug Statistics Methodology.

5) You need to set the stage better as to the value of this study. Is variation good or bad?

Authors’ response:

This article is not meant to address the question whether variation in medical
practice is good or bad. Without a doubt, medical practice variation raises questions about the quality of care and about the use of resources. We added to the introduction: “Although different treatments can be effective, and innovations are not likely to occur when there is no variation, the existence of variation will have an effect on the profession of medicine. Physicians will have to explain why there is variation. Policy makers and third party payers will get involved as they might be convinced that health care expenses can be limited when all physicians choose the most cost-effective treatment. Variation might give patients a choice (at least in theory and as far as patients are able to choose) in the treatment they prefer, and it might help in finding better treatments, but as long as there are questions about the justifiability of variation physicians will have to deal with it, limit or explain it, or otherwise insurers or the government probably will.”

6) You should define acronyms and refer to “this what”.
Authors’ response:
We clarified the subject of the sentences throughout the article and defined acronyms before using them.

7) Why is unwanted variation in prescribing negative?
Authors’ response:
With “unwanted variation” we meant “illegitimate variation”. In general, part of variation can be legitimate, while another part is not. Anderson and Mooney (1990) define variation as a result of differences in patient characteristics such as morbidity and age, as legitimate, while variation caused by ignorance is considered illegitimate. That part of variation that is not legitimate should be reduced. We have changed the sentence on page 5: “The introduction of DSSs is expected to result in more rational prescribing and less unexplained and illegitimate variation in prescribing between physicians [12, 14, 15, 16].”

8) How did you control for the differences in GPs who did not have a DSS and those who did not use available DSS?
Authors’ response:
We did not control for differences in GPs who did not have a DSS and those who did not use available DSS, because our analysis focuses on differences between GPs using a DSS and GPs not using a DSS. In the current paper we did not have a research question or hypothesis concerning the difference in GPs who did not have a DSS and those who did not use available DSS.

9) How does the HHI apply to MD prescribing?
Authors’ response:
As the reviewer correctly states the HHI takes into consideration unequal volumes. This applies to prescription as it does to all kinds of things were unequal volumes appear. The HHI measures competition and in our article the HHI measures competition between drugs. It is therefore a measure of concentration that is appropriate in our study. Originally, the Herfindahl-Hirschman Index or HHI, is a measure of the size of firms in
relationship to the industry and an indicator of the amount of competition among them. The HHI is defined as the sum of the squares of the market shares of each individual firm: ie the average market share, weighted by market share. Increases in the HHI generally indicate a decrease in competition and an increase of market power, whereas decreases indicate the opposite. In our article we use the HHI as a measure of concentration for drugs prescribed. If not many different drugs are prescribed, concentration is high (competition is low). We measured the amount of different types of drugs prescribed per diagnosis as an indicator of the concentration (or the amount of competition) between them. This could have been done by counting the number of different drugs per diagnosis, but counting does not take into account unequal volumes. The major benefit of the HHI is that it takes into consideration unequal volumes. That is why we chose the HHI.

10) Why do you think the age and sex of the patient would apply to the parameters of this study?

Authors’ response:

GPs with different patient populations could have different prescribing behaviour. We did not find an effect of age and sex and therefore these characteristics were not included in the final analyses. In the article we wrote: “To account for differences in patient population between GPs the mean age and sex of the patient population of a GP were initially included. These variables did only have a small effect and were excluded from the final analyses.”

11) The material on page 11 is redundant.

Authors’ response:

We were unable to make changes here, because we are not sure to what material the reviewer is referring.

12) The material on page 12 is particularly disturbing.

Authors’ response:

The material on page 12 was meant as a critical note in general. This material should not be disturbing. Since this critical note is not absolutely necessary and readers could misinterpret our meaning, we removed the paragraph from the article.

13) Table 1 is not useful.

Authors’ response:

We removed Table 1 from the article.