Author's response to reviews

Title: A population-based study of the volume of ambulatory and surgical services provided by orthopedic surgeons for musculoskeletal conditions

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Author's response to reviews: see over
Dear Dr. Koutsos,

The authors thank the reviewers for their comments and suggestions. I have included the author’s response addressing the reviewers’ minor and major points below. We feel we have addressed the major points presented in the reviews.

Response to Reviewer 1

Major Compulsory Revisions

Abstract

1. The background section would be improved if it included some description of the problem of ortho surgeon shortage and why these analyses are important. Also, “in the context of services provided for all conditions” is a bit vague and could be misleading (i.e., you are not looking at ALL health conditions – just musculoskeletal).

Response:

- The text was revised and changes were made to indicate how the analyses presented in this paper may provide information to develop strategies to maximize the availability of orthopedic resources. The reference to all health conditions has been deleted. However, although the paper focuses on the orthopaedic services provided for the management of musculoskeletal condition we included all conditions seen by orthopaedic surgeons. Other non-musculoskeletal conditions represented about 6% (Table 1) of all conditions seen.

2. Methods could be improved with more of a description of what was examined – i.e., total volume of services, hospital vs. amb care, according to type of condition, etc.

Response:

- The text was revised and a description of the variables was added to the methods for clarification.

Results

3. Results – 3rd sentence could be removed – first 1 sentences really cover this.

Response:

- The sentence was removed.
4. **Results - 4th sentence – does this refer to amb care of all visits?**

Response:

We have clarified that they refer to ambulatory visits.

5. **Conclusion – 1st sentence may be improved by removing “as well as surgical care” – or make some other change to emphasize that large volume of amb care services performed.**

Response:

We have changed the two first sentences to emphasize the large volume of ambulatory care provided by orthopaedic surgeons.

**Introduction**

6. **First paragraph, last sentence – phrase about cost of injury is a bit unclear & makes the sentence confusing.**

Response:

We have clarified and focused only on musculoskeletal conditions. Text was revised and changes were made.

7. **Last paragraph, second sentence – long & could be shortened / clarified.**

Response:

Text was revised and changes were made. We have revised the last paragraph to more clearly describe the purpose of our study (see also reviewer 2).

**Methods**

8. **First paragraph – it is stated that the claims for 2005/2006 can be “considered to be representative of the total population.” I am not familiar with whether there are waiting lists / times for visits to orthopedic surgeons in the Canadian healthcare system. If so, this should at least be mentioned in the discussion section, as this means that the total volume of services is representative of what orthopedic surgeons are currently doing, but not the total “need”. If this is the case, it further emphasizes the need for augmenting ortho care with other health professionals who may be able to fill some of the amb care needs.**

Response:

We have modified the methods to note that the study is representative of the total population accessing services. We have added a comment in the discussion on the potential impact of the findings on waiting times for patients potentially in urgent need for surgery.
9. How were the specific health conditions for each of 4 diagnostic groups chosen. If this was done by authors’ consensus / expert opinion, that’s fine, but should be mentioned.

Response:

The text was revised and a new paragraph was added explaining that the diagnostic groups used are those employed in early work and were developed with input from a practicing orthopaedic surgeon.

10. I also think that it would be useful for readers to be able to see the health conditions included. If allowed by the journal, consider an online appendix including this.

Response:

The list of conditions included is described on the methods. In addition we have included a table with a list of diagnosis codes at the end of the manuscript.

11. In general more details could be provided regarding the analyses – i.e, analyses were done according to age x gender x diagnostic group categories.

Response:

The text was revised and more details on how analyses were performed are given in the section.

12. It should be noted that when calculating the # of encounters for a given diagnostic group, this was based on the # of visits including an ICD-9 code within that grouping (if that is indeed the case). It should also be mentioned somewhere that the # of visits in each of these categories is not necessarily per-condition or injury. In other words, in estimating the # of visits for people with an injury or related condition, it’s possible that this included more than 1 injury per person. Or someone may have multiple diagnoses in the arthritis category. This is how I’m assuming the analyses were done…this could be clarified.

Response:

In the ambulatory care database only one diagnosis code is recorded per visit. However, a person might have more than one visit for multiple conditions within the year. Persons are counted within each condition (i.e. osteoarthritis, rheumatoid arthritis). For the major diagnostic groups persons were counted once. For instance, if a person had visits for OA and RA, the person was counted within the OA and RA group and was counted one time in the arthritis and related group. The text was revised and changes were made for further clarifications. A new paragraph was added in the methods section to explain this issue with more details.
Results

13. Should the 2nd paragraph have a heading of Ambulatory Care Encounters, or something like that?

Response:

A heading was added.

14. When describing the analyses of amb care encounters according to gender/condition, state that these were results of the Poisson regression models (if that is the case) and whether comparisons were statistically significant in each comparison described.

Response:

The text was revised and more details on how analyses were performed are given in the section. Poisson regression was used to test whether the trend by age and sex was statistically significant. The text in the methods section was revised and explains the analysis in more details.

15. Last paragraph – Is the 1st p-value from a Poisson model, and does it refer to the age or sex parameter?

Response:

The first p-value corresponds to the interaction term between age and sex to support the description that follows. The text now states that p-values were derived from a Poisson regression model.

16. In Figure 1, is “Trauma” the “Injury and Related” category?

Response:

Text was revised and changes were made.

Discussion

17. Overall I think the discussion can be shortened a bit. Some sentences/paragraphs include similar information/themes.

Response:

The discussion was revised and the modified accordingly to condense the information.

18. 6th paragraph, 1st sentence is a bit long & could be shortened or separated.

Response:

Text was revised and changes were made.
Response to Reviewer 2

Major Compulsory Revisions

Because the dataset is quite rich, I suggest the authors pruning the statement with more focus on your findings correlated to the shortage of orthopaedic surgeons, in order to give the readers a clearer picture of your study.

Response:

We appreciate the reviewer’s comment. Although we agree that linking the amount of care provided by orthopaedic surgeons to data on provision of orthopaedic services is important, this is beyond the scope of this paper. The aim of this paper was to examine the amount of care that orthopaedic surgeons provide to identify areas where improvements could be made in order to maximize the availability of orthopaedic services particularly where shortages of these services exist. The text has been revised and changes were made accordingly to emphasize the purpose of the study.

Abstract

1. The 1st sentence in the background mentioned the process of population aging and the consequence of increase in prevalence of musculoskeletal conditions. This may mislead the readers that the population under study was the geriatric group. I suggest modifying the 1st sentence with a statement focusing on the why the study is important. For example, the shortages of orthopaedic surgeons increased due to the aging population increased.

Response:

Text was revised and changes were made.

2. Results, last sentence: “These findings suggest that less than one a quarter of individuals seeing an orthopedic surgeon get orthopedic surgery”— It is difficult to correlated the number of patients were seeing orthopedic surgeon and the number of patients who had orthopedic surgery. You may say that the orthopaedic surgeon may distribute more time at operation than ambulatory service.

Response:

Although this is an important finding that supports the significant role of orthopaedic surgeons in the medical management of MSK conditions we agree with the reviewer that it is difficult to quickly derive the figure from the data presented. The sentence was removed from this section.
Material and Methods

3. In the 2nd paragraph, it would be beneficial if you could give the readers more detailed information on why “ambulatory encounters were obtained by removing claims for diagnostic and therapeutic tests and procedures”.

Response:

Physicians in Ontario submit claims to OHIP for every procedure and consultation performed. It is assumed that claims for these therapeutic and diagnostic procedures are associated with an ambulatory encounter; therefore by excluding those we are ensuring that we are not double counting visits to physicians.

Results

4. Please state only the important relevant findings. No need of detailed description of each number.

Response:

Text was revised and changes were made.

5. 4th paragraph, 2nd sentence: the author mentioned: “only “a quarter of those surgeries were TJR. It would be good to let the readers know why a quarter of surgeries are not enough. You may also want to compare with other countries and provide a reference to support the statement.

Response:

It is clear that we give the wrong impression with this sentence. We meant to emphasize that given the media attention to joint replacement, this type of surgery is a small component of the total work that orthopaedic surgeons do. We have removed the word “only” from the sentence to avoid confusion.

6. Table 1: Some errors were noted in the number of encounters in all conditions (1,326,556# 1,125,800 +182,309) and bone and joint conditions (178,002 # 141,089 +18,466).

Response:

Tables were revised and changes were made.

7. Table 3: Please give more information to explain why the column totals in several subgroups were less than 100%.

Response:

Tables were revised and changes were made. The reason why the percentages were less than 100% are: the variable service setting had missing values in some records and we omitted the category “other surgeries” in the surgical groups variable. Since this created confusion, a note was added to the table when missing values were present and the category “other surgeries” was added to the table for completion.
Discussion

8. Can you provide the commentary on the implications of the age-related and sex-related findings in Figure 1?

Response:

Text was revised and changes were made.

9. Suggest omitting the last sentence in the 3rd paragraph and may give some commentary on the importance of your results.

Response:

We agree with the reviewers that the sentence did not add substantial information, hence it was removed.

10. 5th paragraph: "However, taking into account the average number of visits, the ratio of surgical encounters to the number of patients seen in ambulatory settings suggests that only about a quarter of individuals seeing an orthopedic surgeon are likely to have an orthopedic procedure” Please refer to the comments for abstract.

Response:

This is an important finding that supports the significant role of orthopaedic surgeons in the medical management of MSK conditions. The figure is a crude estimate obtained by juxtaposing the number of ambulatory visits, the number of visits per patients and the number of surgeries. There were 144,705 surgeries and 1,125,800 ambulatory visits (2 visits per patient). 1,125,800/2 = 562,900 patients; 144,705/562,900 = 25.7%. Since the statement generated confusion it was removed from the text.

11. 8th paragraph: The findings in this paper seemed not to be enough to make any inference that trained health professionals can manage non-surgical musculoskeletal conditions and the integrated care model will be a better choice.

Response:

We agree with the reviewer that this paper does not provide information about the appropriateness and benefits of an integrated model of care. The text was revised to reflect the opinion of the authors that one way to increase capacity for surgery is to use integrated models of care which has been shown to be beneficial.

12. Last paragraph: It would be important for the authors to give more information on the difficulties and limitations in using CCI code.

Response:

Supplementary information was added to the text.
13. *It would be interesting if the authors can give us the number of patients with musculoskeletal problems treated by orthopedic surgeon compared with other specialties.*

**Response:**

We appreciate the reviewer’s comment but the purpose of this paper was to examine in detailed the work that orthopaedic surgeons do. Nevertheless, in the third paragraph of the introduction we provide with general information on the percentage of people with MSK problems seeing orthopaedic surgeons.

**Minor Essential Revisions**

**Abstract**

14. *Results: 7th sentence — better to use “fifty percent” rather than “50%” at the beginning of the sentence.*

**Response:**

Text was revised and changes were made.

**Material and Methods:**

15. *In the 4th paragraph, suggest omitting “Diagnosis codes can be obtained from the authors”.*

**Response:**

Text was revised and changes were made. We have added additional information on how the diagnostic groups were created and a table with diagnosis codes was added at the end of the manuscript.

16. *In the 5th paragraph, suggest omitting “More details of the surgical groups can be obtained from the authors”.*

**Response:**

Sentence was deleted.

17. *5th paragraph, last sentence: suggest using identical term in the same article and replacing “day surgeries” with “same day surgeries”.*

**Response:**

Changes were made.
Results

18. Since the study population was very large, it would be better to the authors to present the data of the 95% confidence interval instead of the p values only.

Response:

We agree with the reviewer that since the study population is large it would be better to use confidence intervals. However, given that we do not have a sample since we are capturing almost the total population we decided not to include them in the tables.

Since Poisson regression was only used to test for the overall trend of surgeries by age, sex and diagnostic groups we feel that including confidence intervals will not add significant information to these results.

19. Table 2: Some of the row totals exceeded 100%. May be due to the rounding off process?

Response:

Table was checked and corrections were made.

Discussion

20. At the end of 1st paragraph: the abbreviation “MSK” was first noted here. Suggest replace with “musculoskeletal”.

Response:

Text was revised and changes were made.

Sincerely yours.

Mayilee Canizares