Author's response to reviews

Title: Prevalence estimates of multimorbidity: a comparative study of two sources

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Author's response to reviews: see over
To the BioMed Central Editorial Team,

On behalf of my colleagues and myself, I would like to thank you and the reviewers for the comments on our manuscript “Prevalence estimates of multimorbidity varied with study population and the number of candidate diseases considered: a comparative study,” Version 1 (MS: 1702711119328713), submitted for publication to BMC Health Services Research. Please, note that we have changed the title of the manuscript to “Prevalence estimates of multimorbidity: a comparative study of two sources”.

Below, you will find a detailed response addressing each reviewer comment.

Reviewer: Helena Britt

Comment:
1. Abstract
The objective is not clear – the two studies different in more ways than the ‘study populations”. They also use different methods to collect the data. I suggest the last 2 lines of Background should read:' ….from two sources and to examine the impact of the number of diagnoses considered in measurement of multimorbidity'.

Response:
The last two lines of “Background” were changed according to the suggestion.

Comment:
2. Title: The title is somewhat verbose – could it be shortened without losing meaning?

Response:
The title was changed while keeping with the subject of the study.

Comment:
3. Background:
3.1 Line 6. The studies have diverse data collection methods too and this also affects results. Broaden the statement.

Response:
The statement in line six now lists the diverse data collection methods used and questions how this may affect results.

Comment:
3.2 Last line page 1: ‘careful consideration’ will not fix the lack of uniformity. I suggest you replace this: ‘ used should be uniform’.
Response:
The expression was changed according to the suggestion.

Comment:
3.3 Page 4 lines 2 and 3: this almost reads like a non sequitur. Needs re thinking.
Response:
The paragraph containing line 3 of page 4 in version 1 of the manuscript, which is the last paragraph of the Background section, was changed to logically follow the idea of the previous paragraph.

Comment:
3.4 Last two lines of Background: this is an awkward sentence. Do you mean “…derived from general and family practice-based populations and to examine the impact on prevalence estimates within the practice based population, of variation in the number and range of different diagnoses considered.”?
Response:
The meaning in the last paragraph of the Background section was clarified.

Comment:
4. Discussion
4.1 See comments in methods.
Response:
Responses to comments are in Methods

Comment:
4.2 Page 8: last paragraph. This section makes me wonder if the problems chosen in you study from the records were limited to ‘active’ or ‘ever’ managed? Also ICPC diagnostic groups are called ‘rubrics’ rather than diagnostic groups.
Response:
The problems retrieved from the records were considered active unless stated as resolved. Antecedents were also recorded but not included in the count of chronic problems if they were no longer “active”. The expression ‘diagnostic groups’ was replaced with ‘rubrics’.

Comment:
4.3. first paragraph makes the point that Netherlands study included all patients from the register. This could be made more clear if you put in brackets (including low attenders) at the end of the second last sentence in this para. It would also make it clearer if you extended the sentence before ( line 10 of the para) by pointing out that those with complex needs come more often and therefore have a higher chance of selection in the sample. You and I know that…. But have others thought about it?
Response:
Suggestions were included to make the discussion of this issue clearer.

Comment:
4.4 The suggestion that there should be a standard list of chronic conditions is good. However, there is. See O'Halloran J, Miller GC, Britt H. Defining chronic conditions for primary care with ICPC-2. Fam Pract 2004 Aug;21(4):381-386. Admittedly this is according to ICPC and since the data in your study are not classified it would not be perfect. However, perhaps you should be aware of it and discuss this paper?

Response:
We thank the reviewer for the suggestion and addressed it in the discussion.

Comment:
4.5 Page 10 para 2: Your higher prevalence in men of younger age-groups is logical considering the recruitment process (consecutive) + the fact that younger men are known to attend far less often than younger women, so they have an even higher chance when recruited in this way, of having chronic problems. Note that ref 7 measured multimorbidity as 2+ CIRS groups, rather than individual diseases – more implications!

Response:
We expanded our discussion of ref 7 about the use of CIRS in prevalence estimates.

Comment:
4.6 Patient self report Page 12. There is a myriad of literature showing patient knowledge as well as recall are poor regarding their own health. And more that study differences between patient self report and medical record audit – not just for multimorbidity, but for specific morbidity. While you talk about it, the ‘knowledge versus recall issue is not raised and there is a lack of reference to the latter set of studies.

Response:
The limit to patients' recollection of their diseases is now addressed in the discussion.

Comment:
4.7 Overall, The discussion somewhat rambles and goes far beyond the implications of the results. It needs tightening up and could do with some resorting into a more logical argument, with the limitations put together in one section.

Response:
The discussion was lightened by removing sentences and paragraphs that went beyond the implications of the results. It is now more focused on the main objective of the article.

Comment:
5 Methods
5.1 Was the self report open or a set list to which an answer was required for each? I cannot access the referenced article. It is important because open ended
question will result in less recall than a set list with yes/no response to each. This has implications for your discussion.

**Response:**
As it is now explained in the discussion, with the exception of psychiatric diseases, questions about the presence of diseases in the Canadian Community Health Survey used a determined list.

**Comment:**
5.2 I note from ref 13 that you did not adjust for the cluster design in your study. It is of no consequence how small the intracorrelation is, it should be done automatically. It will not affect the point estimates in the current work it will just broaden the CIs. In this paper it would in fact make no difference to the overall results because the differences are so large. However, if adjustment is not to be done in this paper you need to repeat the statement about the lack of adjustment for the cluster.

**Response:**
The statement on the lack of adjustment for the clustering of patients by physician was included in the Methods section.

**Comment:**
5.3. Was the decision as to what should be classed as chronic disease (in any medical record) left entirely to the staff? What happened when a patient record had both a diagnosis of ‘hypertension’ (which would presumably be uncomplicated), and later in the record a diagnosis of hypertension with kidney involvement-- “complicated hypertension”, Would this be classed as one diagnosis with progression, or as two? This ties in with the lack of a clear definition of inclusions for chronic disease. Please make clear in the method. These issues also need to be considered and brought up as in the discussion.

**Response:**
Good point. If a diagnosis of renal failure was noted in the chart of a patient with hypertension, it was considered as a distinct chronic disease, whether related to hypertension or not. The same was applied to any diabetes complication. If a complication was stated in the chart, then it was recorded as distinct. This way, a patient with diabetes, renal failure and neuropathy was considered as having 3 chronic diseases or conditions.

**Comment:**
6. Results: In general clear.
6.1 Line 7-8: This sentence is wrong I think. It seems it should read: ‘In the general population the prevalence of => 3 diseases was 3.4%... among men and 4.5%.... among women (otherwise we have >90% of your population with no gender!).

**Response:**
The sentence was corrected.
Reviewer: Thomas O'Dowd

Comment:
I would like to see the list of seven diseases from the community studies, listed in an appendix.

Response:
The list of seven (7) diseases used in the Canadian Community Health Survey was included towards the end of the first paragraph of the Methods section.

As requested, we have provided a written response for each point made by the reviewers. We hope that you now find our revised manuscript suitable for publication in your journal and look forward to hearing from you.

Sincerely,

Martin Fortin MD MSc CMFC