Author’s response to reviews

Title: Measuring change in health status of the elderly at the population level: the transition probability model

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Editorial Staff
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Re: “Measuring change in health status of the older adults at the population level: The transition probability model” (MS ID: 1457922378308391)

Authors: Moineddin R, Nie JX, Wang L, Tracy CS, Upshur REG

To the Editorial Staff:

Thank you again for the opportunity to revise and resubmit our manuscript. We would also like to thank our reviewers Donna Wilson and Marten Lagergren for taking the time to read the revised manuscript and make valuable suggestions for improvement. We will address the editorial and reviewer comments in a point-by-point response below. All changes to the manuscript will appear in highlighted text.

Comments by the Editor

As suggested, we have revised the Background section of the Abstract to include contextual information in addition to the study aims. The Background section of the Abstract now reads as follows:

“Background: The current demographic transition will lead to increasing demands on health services. However, debate exists as to the role age plays relative to comorbidity in terms of health services utilization. While age has been identified as a critical factor in health services utilization, health services utilization is not simply an outcome of ill health, nor is it an inevitable outcome of aging. Most data on health service utilization studies assess utilization at one point in time, and does not examine transitions in health service utilization. We sought to measure health services utilization and to investigate utilization patterns and outcomes associated with different levels of utilization.”
**Comments by Donna Wilson**

Dr Wilson has made one further suggestion to improve our manuscript. As suggested, we now have made note in the Limitations section that our study did not investigate patterns of health service utilization among younger persons although they too can be high users of health services. With this project, our specific goal was to understand transitions in health service utilization among older adults as this particular age group is typically under-studied and, even when studied, often classified as one homogenous group (i.e., age 65+). We have long suspected, and our results confirm, that there exists considerable heterogeneity in the population of adults aged 65 years and above.

**Comments by Marten Lagergren**

Dr Lagergren requests several clarifications, which we will address in turn:

1. We are grateful to the reviewer for pointing out again the high annual population increase of older adults in Table 1. We have re-run our statistical model and we found a coding problem that resulted in an error whereby those patients who had passed away were not excluded from the counts for the year 2002 onwards. Fortunately, we have been able to confirm that this error did not affect any of the other analyses. A corrected version of Table 1 is attached. The revised Table 1 still shows an increase in men over the age of 90 greater than females, in relative terms. The increases in older age groups are now consistent with Census Canada data. We apologize for the confusion that was generated by this error on our part.

   With regards to the question re OHIP coverage: there is only a slight difference between the OHIP eligible population and the Ontario population in that there is a small number or people residing in Ontario who are not OHIP eligible. This is a very small number because the vast majority of Ontario residents are eligible for universal health insurance; therefore, this is not likely to influence our results.

2. The reviewer inquired about the possible processes underlying the findings of our study. We do not think that the increases in utilization are due to increasing supply of family physicians because, in Ontario, the supply of family physicians has not kept pace with population growth. Indeed, there are many underserviced areas in Ontario and substantial percentage of Ontarians report no access to family physicians. It is therefore more likely that the influence of clinical practice guidelines explains the increases in utilization, although we note in the revised version of the manuscript that this possible explanation requires further research. We have added the following paragraph to the Discussion section of the revised manuscript:

   “The reason for these increases is unclear. It is not likely a function of increased physicians supply, as Ontario has a chronic shortage of family physicians. The supply of family physicians has not kept pace with population increases. The most
significant increases are associated with medication claims. Thus, it seems reasonable to hypothesize that changes in clinical practice guidelines may be implicated in the increase in utilization, as many medications require ongoing laboratory monitoring. This will be a topic for future research.

3. The reviewer noted that a couple of sentences referring to changes in transition probabilities are unclear. One statement referred to the transition probability in the 65-69 group, while the other referred to the 65-85 age group. We agree with the reviewer that the wording was confusing. We have revised this section in the Discussion in order to address the confusion created by the contradictory statements.

The reviewer also suggests several discretionary revisions:

4. As suggested, we have reformatted Table 3 so that it now fits onto one page. This will greatly enhance the readability of this table and we thank the reviewer for this suggestion.

5. The reviewer suggests that the trends over time in transition probabilities be shown in a diagram or collapsed into fewer categories. We are reluctant to collapse our data into fewer categories – we believe that the finer breakdown of the age data is a great strength of our study – so we will leave this decision to the discretion of the editorial staff.

**Conclusion**

We hope we have satisfactorily addressed the concerns of the reviewers. Again, we thank our two peer reviewers for their time and insightful comments which we believe have significantly improved our manuscript.

We look forward to your editorial decision.

Sincere best wishes,

Ross Upshur, MD

For Rahim Moineddin, Li Wang, Shawn Tracy, and Jason Nie