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
BMC Health Services Research

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

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

To the Editorial Staff:

Thank you very much for the opportunity to revise our manuscript. We are also grateful to the reviewers for their close attention to our manuscript and for their helpful comments. Our responses are in bold beneath each comment.

In this letter we will respond to each comment made by the reviewers. While we agree with many of their comments, there are areas of substantive disagreement which will be noted in our response.

We hope the revisions and clarifications will adequately answer the reviewers concerns.

Response to comments by Marten Lagergren:

1. As suggested by the reviewer, we have formatted the tables to make them more readable: we have clarified the titles of the tables and in tables 3 and 4, and we have modified used acronyms as Male (M), Female (F), Low Users (L-U), Medium Users (M-U), and High Users (H-U). We are unsure of the claim that the results have not been analyzed. Indeed we have applied statistical tests as described in the methods section.

2. We agree with the reviewer that our conclusions are in agreement with the existing literature. This literature does not, to our knowledge, analyze in detail by age and gender the transitions from one health state to another. It is quite one thing to say this is general knowledge, but quite another to actually assign a more precise measurement to a defined group. We believe that our study showed that when a patient enters to high user state he/she has more than 70% chance to remain in this state and almost no chance to move to low users state. This finding will assist clinicians to inform and prepare the patient for the future course of health services expectations and allow clinicians and care givers to make informed choices about the level of health care utilization they desire. One of us (RU) is an experienced clinician with a largely senior practice. Wishing more precise information on prognosis was a motivating force in this study. We have made changes in the conclusion section to reflect this.
3. We agree with the reviewer that we need to justify the Markovian nature of the process. We modified the paper highlighting the fact that we only used transition probability and didn’t use the possible Markovian nature of the process. We were interested to investigate the short term effect of extensive use of the healthcare system because many treatments are administrated for short term results; therefore we only considered the probability of transitioning from one state to another in one year. The same methodology can be applied for longer term follow up.

4. We did not exclude the long-term and home care data. As we mentioned on page 13, this is a limitation of our study that these data are not available in our secondary databases.

5. We agree with reviewer that the cost and burden of the components of our defined events are not the same, however we demonstrated that they are consistent and measuring the same domain. This issue was addressed in the method and results sections. Recent studies, such as Fleishman J., Cohen J. (Using Information on Clinical Conditions to Predict High-Cost Patients Health Services Research; 45(2): 532 – 552) show similar results. Our own research has indicated that total utilization events are predictive, regardless of any weights that may apply (Nie JX, Wang L, Tracy CS, Moineddin R, Upshur RE: Health care service utilization among the elderly: findings from the Study to Understand the Chronic Condition Experience of the Elderly and the Disabled (SUCCEED project). J Eval Clin Pract 2008, 14(6):1044-1049). The objectives of this study are not economic analysis, but to look at system dynamics.

6. The reviewer inquires about the discussion of results in the Discussion section. These reported results are not our findings. These are results of published studies which are referenced in the article. We know from cited research that most medication prescriptions to seniors are for chronic disease management, particularly cardiac disease, hypertension, osteoarthritis, depression, and gastroenterological conditions. We have added references and clarified this point.

7. The reviewer asks about the population development in Ontario presented in table 1. The reported results in table 1 are not the population of Ontario. They are the number of people who registered as resident of Ontario with the Ontario Health Insurance Plan. We wrote a sentence for clarification.

Response to comments by Donna M Wilson:

1. The reviewer inquires on the use of collective counts of this diverse set of health services as the point of investigation. This issue was also raised by the first reviewer and we have provided our explanation above. While these may be different in terms of cost, they are, surprisingly, similar in terms of prognosis.
We agree with the reviewer that the burden of a surgery on the patient and healthcare system is different with a physician visit. We have conducted additional analysis, using Cronbach’s alpha, showing there is an acceptable consistency among these measures that makes it plausible to combine them as a single measure. We modified methods and results sections to address this issue. All outpatient visits were included in the analysis.

2. The reviewer inquires about why drug claims or medication prescriptions are used in the count, as medications are supposed to keep people well and out of hospital presumably. Here we have a disagreement with our reviewer. We wish it were true that medications kept people out of hospital, but what is actually occurring is that seniors are being prescribed increasing numbers of medications without evidence of benefit. Indeed, iatrogenic illness associated with medication prescription in this population is associated with a high burden of illness and has become recognized as significant cause of hospitalization in this population and a major patient safety issue. In fact most family physicians in Ontario are now in some form of capitated or blended remuneration scheme, not fee for service. Family physicians account for 85% of prescriptions issued to seniors in Ontario, so it is not likely a fee for service effect.

3. With respect to the introduction, we respectfully disagree with the reviewer as we see nothing misleading or unreadable in the first two paragraphs. However, we have edited the first two paragraphs.

4. As to why this study focused only on seniors, part of the explanation lies in the fact that our secondary databases do not include all the services for all residents of Ontario younger than 65 years. This is a limitation of our study that is addressed in the paper. As well, evidence in the Primary Care Atlas, (now cited in the paper) demonstrates that seniors are indeed, the highest users in the health system of Ontario.

5. We agree with reviewer that the finding for people younger and older than 65 will be different, however as we mentioned in the paper we do not have all the information for all residents of Ontario in our existing administrative databases. As well, the focus of our research program is on health services utilization of seniors.

6. The reviewer inquires about the exclusions in our study. All individuals who died were excluded (now added to the Methods). We also assumed that if a person age 65 and over does not have any contact with the healthcare system for two consecutive years, it is very likely that the person is either moved out of province without his/her file being updated or the person is dead and his/her record hasn’t been updated yet. The percentage of this group of people is very small and will be unlikely to alter the findings of this study.
7. The reviewer asks why we did not follow a defined set of people year by year or over time, but instead used annual full population findings. We are interested to look at the healthcare utilizations and the change of state over time from a systems perspective not primarily an individual perspective.

8. We did not focus on each health service separately, but instead collectively count total use of these select services. This is because we believe our number of events as a composite measure is an easy to calculate measure and is a good proxy for the health status of a patient. Please see above comments to reviewer one on our choices. As well, we have separately published detailed separate counts of utilization in the paper we have cited. (Nie JX, Wang L, Tracy CS, Moineddin R, Upshur RE: Health care service utilization among the elderly: findings from the Study to Understand the Chronic Condition Experience of the Elderly and the Disabled (SUCCEED project). J Eval Clin Pract 2008, 14(6):1044-1049.)

9. As suggested by the reviewer, we have revised the Results, and the Discussion/Conclusion sections extensively. Changes are highlighted in yellow. We believe the gender section is germane as the results show marked differences by gender.

10. We thank the reviewer for her point that individuals of different age groups are part of unique cohorts. We are a team well versed and experienced in the provision of care to seniors and are aware of cohort effects. It underscores the importance of our work as the boomer generation will likely not share the health care seeking behavior of the current cohort we have studied. It is fair to assume that the change in healthcare utilizations will follow the same trend at least over the next few years, but may increase dramatically as the boomer generation enters retirement age. Our Table 3 is presented to show how the utilizations of for example people age 65-69 will change over time and it is expected similar trends continue in the near future. We think this method will be robust to these changes and as we have access to data bases we can track these changes over time.

11. The reviewer is correct to point out the suppressed premise, why chronic illness becomes a focus in the later part of the paper. Ancillary data, not presented, indicates that the vast amount of utilization in the late life course occurs for chronic diseases. We have added a reference to the Primary Care Atlas that addresses this issue specifically.

12. The results of table 4 show that the probability of remaining in high users’ state is 70% for people age 65-69 and 0.85 for people age 100+. In our view it is a real risk for a large growing segment of the population that needs immediate and serious attention.

Closing
In conclusion, we once again thank the peer reviewers for their attention to this manuscript. We believe we have answered every call for revision and that the resubmitted manuscript is substantially improved as a result of the reviewers’ insightful critiques.

We look forward to hearing from you in the near future and hope that the move to acceptance to publication will proceed subsequently.

Sincere best wishes,

Jason Xin Nie and Ross E.G. Upshur

On behalf of L Wang, CS Tracy, and R Moineddin