Reviewer’s report

Title: Acute hospital-based services used by adults during the last year of life in New South Wales, Australia: a population-based retrospective cohort study

Version: 2 Date: 24 August 2015

Reviewer: Peter Tanuseputro

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General Comments

This is a descriptive study presenting data on the use of hospital services by residents in New South Wales (NSW) in their last year of life. The study uses linked health administrative databases, and employs a retrospective cohort approach to examine health care use in the last year of life on a census one-year decedent cohort. The paper was well written and easy to read through.

It is overall a study on a topical subject, and gives a rare population view of end-of-life health care. There are however, previous similar studies internationally that the authors have not reference or discussed. This would have been helpful to round out a good background/discussion section. One major gap of this study, as pointed out, is the lack of inclusion of community based health care use. However, this is fine given the lack of data in this region.

The data presented, although only from one health sector is quite rich. It is from this richness that the authors had a difficult time with focus and key messages. I would recommend that they cut down on the number of outcomes reported, and discussed more on the significance (e.g., concept, directionality, modifiability, benchmarking, etc.) of each of the chosen indicators. The paper is missing clear 3-5 key messages that are helpful in descriptive studies such as these. Correspondingly, it is missing hypothesis/exploratory questions that can would be helpful to direct the paper (e.g., those not dying of cancer do not receive adequate care; that the lack of community resources for palliative and EOL care will lead to high % of hospital deaths and hospital use at the EOL). I do not have a problem at all about the descriptive nature of this paper; but good descriptive papers will have a few clear and interesting angles to view the data. The authors almost get there, but I believe were hampered by the number of outcomes/indicators they were trying to report on in one paper.

Major Compulsory Revisions

1. Line 132-133 & background: Agree most studies have focused on EOL care for specific diseases, but should review others that have looked at have not. Below are a few. The last one being very similar and relevant to this paper. Also, in Canada, there have been a series of reports from the Canadian Institute for Health Information in several provinces (Saskatchewan, Atlantic Provinces, Manitoba) that have the same perspective. The findings of this paper should be
discussed against these international findings


2. In these studies, hospital use is put into perspective against the other health sectors. These studies also use other metrics, such as cost, that are informative. The authors should discuss the findings of this study (including the choice of outcomes) against this literature

3. The authors have examined quite a few indicators of health care use. The measures outlined in lines 217-222 include no less than 8 different outcomes. In my opinion, this unnecessarily lengthened the papers as some of these indicators get at the same concepts. I would have much rather they choose half the number of indicators, and went into some detail on the indicator concept (what does it try to capture), directionality (i.e., up/down = desirable/undesirable and for what reasons), modifiability, etc.

For example, the two indicators for palliative care was difficult to interpret. First, I don’t think it was well explained, and perhaps not necessary, why 2 very similar indicators (one narrow, one broad) was presented. It was presented together with indicators where higher prevalence is worse, while I’m assume higher palliative care in hospital is presumed to be better (although I’m not sure it is, since this is still care conducted in hospital, as opposed to in the community)

4. The authors point out that comorbid conditions were not included in the
models, which would have made the findings of the models much more compelling. They should justify why this was left out. I presume that they had access to a few years of data of previous hospitalization (i.e., prior to 2007) that they could draw from (e.g., using John’s Hopkins ADG’s or Charlson, etc.). I’m ok if this is not reasonably feasible given the resources they had – but this is a major limitation to the study (at least to the multivariable models) and should be discussed further.

5. The main multivariable models are logistic regressions, with the outcome being in the top quartile for 3 of the outcomes: hospital episodes/number of days in hospital/ED visits. The authors should justify why they used this, instead of, for example GLM for continuous outcomes.

6. There were additional outcomes discussed in the results (lines 380-410) that I don’t think were discussed elsewhere (in methods/discussion). “Procedure during hospital admissions” felt out of place; “Final hospital admissions” is interesting, and adds a time component, but wasn’t in any of the tables/models. I would considering including this indicator, in place of one of the other somewhat redundant 8 outcomes

Minor Essential Revisions

1. Lines 75-77: Fragmented sentence
2. Line 79: Would be helpful to separate out in hospital and inpatient hospice death; the former may be undesirable, while the latter appropriate
3. Lines 81-83: “Differences” – should state what major findings are.
4. Conclusion of abstract: should give some interpretive statements: what are the major findings? Do the rates of hospitalization seem reasonable? What are the significant variations? I realize this is a descriptive study, but can outline some of the helpful directions that the study point to
5. Need to consider excluding or separating deaths from external causes – e.g., for multivariable models – to help interpretation of results. At least for sensitivity analyses.
6. Tables 2 & 4: each of the column should have a total number (n) to go along with the %
7. Table 2 should explain that these are the top quartiles
8. Table 3’s “Cumulative deaths” column does not add much – I would just put the total respective n’s (i.e., 6,909 and 10,777) in an added Total row. It would have been much more interesting to stratify by a factor (e.g., Cancer versus not, or by period prior to death: <1 month, 1-3 months, etc.) that would have added to a clearly identifiable key message
9. Figures 1 & 2: missing y-axis figure legend
10. The Methods section in the Abstract contains a clear description of the data, but did not mention the statistical/analytical methods that were used or the variables that were examined – e.g., the use of logistic regression models to compute odds ratios, controlling for age, sex, country of birth, etc.

11. Statistical results, such as the IQRs, should be presented within parentheses. The presentation of statistical results should follow conventional formatting, involving the use of mathematical symbols (e.g., aOR = 2.68, 95%CI = 2.54-2.83).

12. Minor grammatical and punctuation errors (e.g., commas around the use of ‘however’, and before the word ‘respectively’).

13. Some separation between the discussion of the study’s main findings from its limitations would be helpful in the Discussion section (e.g., with the use of sub-headings).

14. There were some inconsistencies in how sources were referenced.

Discretionary Revisions

1. Uncertain why the words “use”, “mention” and “next set of questions” were included with quotation marks in the Discussion section (e.g., lines 451-452).

2. Line 188-197: I would consider using only one of these palliative care indicators; I would suggest the broader second definition. I’m not sure if one or the other adds to the paper.

3. I would also consider adding a time element to at least one of the main outcomes/indicators. For example, while acute care hospitalizations 6 months prior to death may be appropriate for curative efforts, if they were able to describe an increasing number of hospitalizations near the end of life they would be able to make a stronger argument about potential preventability. A figure at least (e.g., describing lines 259-261) may be informative

4. Consider making circulatory causes as reference population, as opposed to “other causes” which is difficult to interpret

5. Table 1: recommend consider adding columns for an interesting stratifying factor (e.g., by cause of death, or by quartiles of whatever chosen main outcome)

6. Consider presenting unadjusted OR’s in Tables 2 & 3

7. I would remove “Accessibility” from the category “Accessibility/Remoteness” – I think this is presuming too much. Maybe just use Region or Remoteness

8. Table 4: I would consider having only palliative care indicator(s) in the table, and moving time spent in ICU in Table 2. This would help in the interpretation of the directionality of the OR’s – that low OR’s are desirable or not
**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Acceptable

**Statistical review:** Yes, and I have assessed the statistics in my report.

**Declaration of competing interests:**

I declare that I have no competing interest