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Title	The primary care and other health system use of home care patients: a retrospective cohort analysis
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Reviewer 1	Dr. Paul Vaucher
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General comments and author responses	<p>This manuscript presents the results from an exploratory descriptive study on period prevalence of primary care use for home-care patients in Ontario.</p> <p>The study uses combined data from registries covering 226'000 patients over six months. The study is however subject to selection, observation and reporting bias. Residual confounding to define patterns of healthcare use is important. The observed associations lead to uncertain conclusions that have been explored using more relevant methods. The manuscript is difficult to follow, research questions are not clear and there are many inconsistencies between stated objectives, methods used to investigate them, and methods to analyse data. Tables are very difficult to read and cover more than one page.</p> <p>Please find my comments, questions and suggestions below.</p> <p>Title</p> <p>1. The study design is confusing. You might want to consider changing the design name from "A retrospective cohort analysis" to a "A descriptive study".</p> <p>RESPONSE: STROBE guidelines indicate that the study design should be included in the title and the phrase "descriptive study" does not indicate a specific design. We believe that retaining "retrospective cohort" is valuable to distinguish the study from other types of that may also be descriptive, e.g. cross-sectional or survey designs.</p> <p>Abstract</p> <p>2. Line 65 – consider changing "examining" to "describing".</p> <p>RESPONSE: We agree that this may be clarifying and have updated the text. (p. 4).</p> <p>3. Line 67 – avoid using the term "retrospective cohort study" as this is something quite specific in epidemiology and does not seem to correspond to your design. This is a clear retrospective cohort study in which we use explicit criteria to identify home care patients from administrative data, measure their characteristics at baseline, and examine health service utilization in the subsequent six months.</p> <p>RESPONSE: This is a clear retrospective cohort study in which we use explicit criteria to identify past home care patients from administrative data, measure their characteristics at baseline, and examine health service utilization in the subsequent six months.</p> <p>4. Providing a clearer description of the study objective would make it easier for readers to follow. Apparently, the study aims to identify and quantify the frequency of patterns of home visits and identify sociodemographic determinants of these patterns.</p> <p>RESPONSE: The key objective of the study, the description of primary care use by home care patients, is stated in the last sentence of the background section (p. 4)</p> <p>5. The methods section should clarify how the patterns were defined and how determinants of interest were chosen.</p> <p>RESPONSE: The primary and secondary outcomes are listed in the methods section of the abstract. However, the abstract is strictly limited in length and therefore there is not sufficient room to provide the details of how each primary care use measure was calculated</p>

or which patient characteristics were selected for multivariable analysis. This is covered in detail in the methods section in the main body of the manuscript. (p. 9-10)

6. What is the exposure of interest? Is this really a cohort study? How was the control group chosen? It seems this study is an exploratory study aiming to describe different visit health service pattern use.

RESPONSE:

The primary objective of this study was to describe primary care use. Examining associations between patient characteristics ("exposures") and primary care use was a secondary objective of this study so there is less detail on which characteristics were examined in the abstract although this is covered in the methods section.

Again, this is clearly a retrospective cohort study, which do not select case or control groups separately.

7. Line 75, The study identified participants or included them? What assessment? Is it not easier to simply say that 226,054 participants were included in the study?

RESPONSE:

We prefer the term "identification" to "inclusion" as it better fits the reality that we are searching through patient records to conduct this study rather than contacting patients directly. The assessment refers to the index home care assessment which is previously mentioned in the methods section of the abstract.

8. It is difficult to find consistency between your title, your methods section and the result section. What patterns have been identified? What were the determinants of these factors?

RESPONSE:

Our title says that we are doing a retrospective cohort study to examine primary care use of home care patients. Our methods section outlines more details on how the retrospective cohort was created and the primary care use measures we are going to examine. The results section lists the size of the cohort and the rates and prevalences of the primary care outcomes.

Although we did look at associations between patient characteristics and subsequent primary care use, the results section in the abstract only has room to list the primary results, which in this case are the rates and prevalences of our primary care use outcomes.

We understand that the word "pattern" may be causing confusion and have removed it. (p. 4).

9. It is hard to see in what way the conclusion is supported by the reported results.

RESPONSE:

The conclusions around the rate of primary care visits and prevalence of coordination are drawn directly from the results listed in the results section the abstract. It is true that comparison with other studies is helpful in determining what is high or low utilization and this is covered in the discussion section. (p. 14)

Background

10. Lines 86-92 – These claims are relevant but it is difficult to link them together and understand what we are trying to get to. It is difficult to have a clear view on the conceptual framework linking all these concepts together.

RESPONSE:

The objective of the first paragraph is to demonstrate the importance of primary care and outline evidence for the aspects of primary care delivery that we will examine in the paper. We have added additional text to the introduction to try and clarify the conceptual flow. (p. 5).

11. Line 98-102. What do you mean by primary care physician use of patients? In what way do physicians "use" patients? This needs to be rephrased. It is unclear what type of patterns is being investigated. The underlying research question is unclear. It is unclear whether this is an exploratory study to find patterns in healthcare use by home-care patients, whether it is a study that aims to describe health use amount home-care patients, or whether it is a study

exploring determinants of patterns of healthcare use amount home-care patients.

RESPONSE:

We have re-worded the objective to avoid confusion. This is a descriptive study, first describing utilization of primary care and then examining associations between primary care use and patient demographics and health characteristics. (p. 5-6).

Methods

12. Apparently, people enter a specific program after an initial assessment. The study follows patients entering the program for one year. Their healthcare service use was documented combining information from several national datasets.

13. How are these patients identified to enter the program? What are the conditions to enter the program?

RESPONSE:

Publicly-funded home care in Ontario is available to individuals who require support to remain in their homes. These patients are typically seniors who with functional impairments or other complex medical conditions. We have added text and a reference to the method sections support this. (p. 6)

14. Why were plaintive patients exploded? This study is meant to identify patterns of healthcare use. Why exclude a group that is known to have a specific pattern?

RESPONSE:

Palliative patients form a distinct group of patients in several senses. When a patient is identified as palliative the goals of care shift dramatically. Both the quantity and quality of primary care and home care services are different and patients tend to receive palliative-specific services. Expected health outcomes are also dramatically different. Therefore, we believe that palliative patients are best examined separately from other home care patients and have excluded them from the cohort

15. Why was the follow-up period initiated by a periodical RAI-HC? In what way does this describe periodic overall use of health systems? Could this bias the overall estimate as health use increases following this assessment? If the follow-up period was planned to be of six months because these assessment are usually made every 6 months, why were some patients seen more frequently and there initial follow-up not retained? Does this not introduce selection bias?

RESPONSE:

The RAI-HC assessment is a logical index event for a home care cohort as it is a rich source of clinical information and forms the basis for care planning within home care. We have no reason to believe that primary care use would increase directly following the assessment and the assessment provides an accurate clinical profile that we can use to test associations between patient characteristics and subsequent primary care use.

Home care patients will typically receive assessments every six months, although some will be discharged before a second assessment occurs. In order to avoid the statistical and epidemiological issues that arise from including the same patient twice in the cohort we had to choose one assessment when multiple assessments occurred in the accrual period. Either first or last would be sensible choices, however we chose last as it yields a better balance between initial and follow-up assessments. We do not believe this engenders any selection bias but in fact better reflects the profile of patients receiving home care, some of whom are newly on home care and others of whom have been receiving home care for years. For a descriptive study we believe this is an advantage. In addition, internal sensitivity analysis (data not shown) indicated that there were not meaningful differences in primary care use after initial assessments compared to follow-up assessments.

16. What was the follow-up duration for each patient? This is reported at line 133. It would however be interesting to report this here.

RESPONSE:

We have added text mentioning the six-month follow up to the study cohort section. (p. 7)

17. Line 122-124 – Was this a selection criteria? Is this study only investigating healthcare use for patients with one or more of these three conditions? If so, should this not be reported in the abstract and in the study population?

RESPONSE:

The chronic diseases were not a selection criteria but a baseline characteristic later used as a stratifying factor and independent variable. We feel this is clear as it is located in the "Baseline Characteristics" section rather than the "Study Cohort" section but have edited the text to clarify. (p. 7)

18. Lines 125-130: Is this your exposure factor? Are trying to see if patients using different enrolment systems tend to have different healthcare pattern use? This is not clear and it is still difficult to know what your study is designed to investigate.

RESPONSE: The primary care enrollment model is a baseline factor that was examined in the multivariable analysis. At this point in the paper we are describing what these variables are and later in the methods section discuss how they are used.

19. Lines 153-161; From the statistical method section, it seems the study mainly aims to describe period prevalence of healthcare use.

RESPONSE:

Describing healthcare use within 6 months of the index assessment is the stated objective of the study.

20. Lines 173-181; It is not clear what primary care use measure was modelled; was it PCP visits? Why more than one model? Is this what you have called patterns of healthcare use?

RESPONSE:

We modelled all four of our primary care physician measures: rate of primary care physician visits, primary care physician coordination with home care, primary care physician home visits, and primary care physician afterhours/weekend visit. We are looking at all four measures as we are interested in the aspects of primary care delivery we identified in the introduction in addition well as overall primary care use. As mentioned previously, we have removed the word "patterns" to avoid confusion.

Results

21. Line 200; one visit per month or one visit over six months?

RESPONSE:

We have clarified that the proportion referred to at least one visit during the follow-up period. (p 11).

22. Line 201; What has billing claims to do with the explored model and why was this not mentioned before as a determinant?

RESPONSE:

"Billing claims" simply refers to the data that we capture from the Ontario Health Insurance Plan database, which is the source of all of our primary care visit data and is a database of physician billings. We have altered the text of the sentence to be consistent with previous language. (p.11)

23. Lines 220 to 227; Here we discover the determinants of PCP coordination. The reported determinants are already known and expected. Why was it important to do this study and in what way can these results be of interest for public health policies. This needs to be clarified in the introduction.

RESPONSE:

Prior to this study it was not known how frequently primary care coordination with home care was billed or with what the use of the codes was associated. The fact that they are billed so infrequently is interesting, even if it underrepresents the true level of coordination. Moreover, the higher prevalence of the codes in interprofessional practices is of interest as it suggests that how practices are organized may influence the likelihood of coordination. The relevance

	<p>of these findings is discussed in the interpretation section. (p. 13-16)</p> <p>Limitations 24. Lines 273-278 It seems important to report that only the determinants that are made available from different registries could be used. These do not provide a clear view on health conditions and needs to explain differences in patterns. Residual confounding is therefore important and the presented model explaining PCP use is limited.</p> <p>RESPONSE: The RAI-HC is a very rich data source so were able to include almost all of the factors that we were interested in. We have additionally highlighted a few pieces of information in the limitations section that we would liked to have known (p. 15). As this is an exploratory descriptive study our conclusions are hypothesis-generating rather than hypothesis-confirming and residual confounding is not as great a concern as it would be in a more inferential study. Nevertheless, we believe we have included the most important predictors.</p>
Reviewer 2	Dr. Leonard Tu Nguyen
Institution	University of Calgary, Pathology and Laboratory Medicine
General comments and author responses	<p>With this manuscript, Jones et al present a cohort analysis of primary home care usage, which has not been greatly studied so far. Their analyses and conclusions seem sound, and the Sankey diagram in Figure 1 is a nice and informative touch for visualization. I highly recommend the publication of this work in CMAJ Open, and I have some minor comments/suggestions (page numbers according to the top alternating corners):</p> <ol style="list-style-type: none"> 1. P.7, line 109 – can you briefly clarify the justification for ethics review exemption? <p>RESPONSE: ICES is a prescribed entity under section 45 of Ontario’s Personal Health Information Protection Act. Section 45 authorizes ICES to collect personal health information, without consent, for the purpose of analysis or compiling statistical information with respect to the management of, evaluation or monitoring of, the allocation of resources to or planning for all or part of the health system. Projects conducted under section 45, by definition, do not require review by a Research Ethics Board. This project was conducted under section 45, and approved by ICES’ Privacy and Legal Office. We have additional text to the methods section adding more details on this exemption. (p. 6)</p> <ol style="list-style-type: none"> 2. P.11, line 203 – remove “than patients” <p>RESPONSE: The text has been removed. (p. 14)</p> <p>The text has been removed.</p> <ol style="list-style-type: none"> 3. Table 4 – please add a footnote to mention $p < 0.05$ for all Poisson and logistic regression models/coefficients if applicable. If not applicable, please point out cases of non-significance. <p>RESPONSE: Our understanding is that the house style prefers 95% confidence intervals over p-values where possible. We have provided 95% confidence intervals for all regression coefficients and since examination of the interval indicates whether the p-value is < 0.05 it would be redundant to add a marker for significant or insignificant p-values.</p>