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Title	Who is doing what in primary care? An administrative data method for identifying comprehensive primary care physicians in Ontario, Canada
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Reviewer 1	Dr. Wilson Pace
Institution	Department of Family Medicine, University of Colorado, Aurora, CO
General comments (author response in bold)	<p>This manuscript utilizes claims data from a centralized claims data warehouse in Ontario, Canada to explore the extent to which primary care physicians in this province provide "comprehensive primary care." The authors linked three different databases to find the "pool" of primary care physicians, physician billing for fee-for-service activities and physician treatment activities for those sites in a managed care like environment. The three databases appear to capture the universe of physicians and provide a reasonable approximation of the universe of care activities. Care was taken to identify primary care labeled physicians (for example excluding general internists and gynecologists which do not provide primary care in Ontario.) The study then logically excluded physicians that appeared to spend less than two full months in practice for any given year. The analyzed data extended from 1992 through 2014, an extensive longitudinal dataset. The researchers then identified billing codes for each year that represented primary care services. The criteria for the inclusion of these codes was well defined and reasonable. Though the actual codes used varied slightly from year to year the assumption is that the variety occurred at the edges of the level of services covered by these codes not the most commonly used primary care codes. The sets of codes from year to year accounted for >70% of all primary care physician billings. The billing code sets generally corresponded to "processes" or "procedures" related to care and thus were broadly used and not diagnostically specific except in a few exceptions. The billing codes were then grouped into 22 "activity areas." The "definition" of "comprehensive primary care" was set at billings across 7 of the 22 areas. Overall the definitions seem to be carefully considered for the analytical plan and the analytical activities are logical. The decision to include care areas that encompass place of care, types of care and procedures provides a broad view of primary care practice, as is appropriate for the focus of the manuscript.</p> <p>The results indicate that while the majority of self-identified family physicians in Ontario provided comprehensive primary care, a substantial minority do not. Of the physicians who do not provide comprehensive primary care just under 60% provided focused practice. Overall, though the total number of physicians has increased by 37% the number of physicians providing "comprehensive primary care" increased by only 19% indicating the importance for policy purposes of tracking actual work and not specialty alone. The understanding that the primary care physician count needs to be decreased by 33% for policy makers is a significant and important adjustment figure.</p> <p>The discussion and limitations section were well laid out and concise. The identified limitations and missing data do not appear to be likely to alter the findings. Overall this is a tightly written manuscript that is easy to read and comprehend.</p> <p>There are a few minor issues with the current version.</p> <p>1. The decision to divide services into 22 areas seems rather arbitrary and at times highly granular. There are some combinations of 7 services that could be provided and be fairly restrictive in the populations served and type of practice (for instance focusing on physicians that provide solely "palliative" care and then considering all the items they might bill for one could image hitting 7 areas. These atypical combinations would not likely be very common nor are they likely to affect results to any great degree. Nonetheless, grouping immunizations into one group, grouping the three general "assessments" into one group and perhaps allergy shots and other injections would be just a few of the areas that would guard against potentially over counting similar kinds of services. By grouping the codes into fewer "care areas" the algorithm for comprehensive care may be easier to use as well.</p> <p>We agree that other approaches to defining activity areas would be reasonable, including having fewer activity areas. However, we feel that the current 22 activity areas are quite homogenous within categories and maximize heterogeneity between categories. We agree with the reviewer that atypical combinations do occur uncommonly but would be unlikely to affect the results in a major way. It is our preference to retain the current activity areas but to invite those working in other jurisdictions to adapt these methods to their own data and settings.</p> <p>2. The codes used are specific to Canada and would not translate well to other countries, but the concepts most likely would. Translating the work to other codification schema may also be easier with a few less categories to cross-walk. Overall these are minor concerns and could be accounted for if others are interested in "replicating" this work.</p> <p>We agree with this comment and would invite others to make their own adaptations for other settings. We note in the Conclusion that "We believe this general approach to be widely applicable although the details of how it is implemented would be expected to differ by jurisdiction."</p>
Reviewer 2	Dr. Lee Green
Institution	Department of Family Medicine, University of Alberta, Edmonton, Alta.
General comments (author response in bold)	<p>The question is an important one for health services researchers, particularly as primary care is undergoing the most profound transformation since the Flexnerian revolution. Though data characteristics are specific to each province, the authors have chosen a method that is readily generalized to other provinces, as well as to most OECD nations. (And to US states, caveat that the fragmented multipayer system makes comprehensive data harder to obtain.)</p> <p>The introduction frames the question and the need for the research clearly. The review of existing literature is very brief, but suffices for the purpose of this paper.</p> <p>Methods</p> <p>1. p 4 line 46 the term "shadow billings" is not defined. A simple parenthetical statement would suffice. We have clarified that term. Under Data sources we have added "Shadow billings are submitted by physicians paid through alternate funding arrangements for which they may receive incentives of 10-30% of the full fee."</p> <p>The explanation of the definitions and grouping is sufficiently clear to permit replication in other jurisdictions.</p> <p>Results</p> <p>2. The results are clearly presented. The presentation of the numbers of primary care physicians, and especially the change over years, would be enhanced by including the population changes over those years. Physician:population ratio is more meaningful than raw numbers of physicians.</p> <p>We agree with the reviewer and thank him for this excellent suggestion. We have incorporated these changes in Appendix C and the text of several sections of the paper:</p> <p>Abstract: "Over this period there was an 8.8% increase in population per comprehensive primary care physician."</p>

Results: "While the population per active physician decreased by 7.4% over this time period, there was an 8.8% increase in population per comprehensive primary care physician."

Interpretation: "Despite increases in physician numbers, population growth mean that the availability of comprehensive primary care physicians to the Ontario population declined substantially over time."

Conclusion: "...along with a substantial decline in the availability of comprehensive primary care physicians to the growing Ontario population."

3. The dichotomization of physicians into comprehensive or not, rather than an ordinal scale of comprehensiveness, is a likely point of contention. A sensitivity analysis of sorts, exploring how the results would differ if the dichotomization were done differently, would be useful. For example, non-office settings (hospital, long-term care, and house calls) figure heavily in the results but are debatable as roles for 21st-century family physicians in urban environments (from a health system policy and planning perspective - understanding that those are fighting words to many family physicians). The authors seem to begin to address this in the Interpretation, but do so only partially.

Interpretation

The authors address the key findings and important limitations clearly, with the caveat of the issue addressed immediately above. They outline next research needed thoughtfully.

4. The one item I found missing was discussion of those who were not classified as comprehensive, but not focused either. Examining the profile, that would likely describe many - perhaps even most - family physicians practicing in integrated delivery systems in the US, and that setting is known to do well on the quadruple aim. That should give a health systems planner or policy maker pause.

We thank the reviewer for commenting on this interesting group. In our setting there were 1190 physicians (9.2% of the primary care pool) who were not comprehensive and were not in focused practice. In our case, half or less of their billings fell into core primary care or their billings were restricted to fewer than seven activity areas. These physicians were therefore likely practising in multiple settings. Canada does not have integrated delivery systems such as accountable care organizations so we are unable to comment on how this group would be characterized or how they would be functioning in the US.