Article details: 2022-0061
Title: Distance, access and equity: a cross-sectional geospatial analysis of disparities in access to primary care for official-language minorities in Ottawa, Ontario
Authors: Christopher Belanger MBA PhD, Kady Carr MBA, Cayden Peixoto MSc, Lise M. Bjerre MDCM PhD

Reviewer 1: Dr. John DeGroote
General comments (author response in bold)

Major issues

33. How do the DB level geography and the ONS geography line up? ONS are not based on DBs?
We have adjusted the text to make it clearer that ONS neighbourhoods do not always align with DBs.
ONS neighbourhood boundaries are constructed in consultation with community members and are intended to reflect residents' own views of their communities. Dissemination block (DB) boundaries are set by Statistics Canada based on road networks. These two boundary sets are constructed using different methodologies, and they align in some but not all cases. (Study population, p.5)

34. In Interpretation the statement 'these inequities are generally smaller, however, in neighborhoods with a large proportion of French-only speakers'. o A bit unclear to me and possibly could be be rewritten to be a little clearer.
We have streamlined the Interpretation section for clarity and concision.
(Interpretation, pp. 7-8)

35. P. 5 paragraph lines 14-29. How many is a 'small number of trips' for the comparison? How compared? What constitutes reliable, realistic?
This response is parallel to #28 above.
Since Valhalla's reliability is outside the scope of this paper, we have moved this comment to an appendix and focus in the text on our results.
As a sidebar, the reviewer may be interested to learn that we are working on a separate comprehensive methods paper that will benchmark Valhalla against more common commercial offerings and will address this point more fully there.
(p.5, Appendix B, p.9)

36. P. 5, line 46, 'Each Db was mapped...' maybe change to assigned and change the noun?
We have made this change, and moved the detailed discussion of the algorithm to an appendix where it will not disrupt the main flow of the article. (Appendix B, p.10)

37. Map p. 10. Understand the maps may be made in R but if possible could improve with a base map for some context? And a scale bar? What are the kind of light blue lines (urban to suburban to rural)?
We have added a map of the Ottawa area with a scale bar, overlaid with ONS neighbourhood boundaries, as Figure 1 to provide context. Also made in R.
(Figure 1)

Minor Issues

38. P. 3, line 32, 'The ONS has profiled....'. The verb profiled maybe covers a lot of ground and needs to be explained more.
We have removed the reference to the ONS's work "profiling neighbourhoods" since it is not relevant to the present study. (throughout)

39. P.3, line 37-38, 'Geospatial mapping has ..' change to 'Geospatial analysis.'
We have made this change. (Introduction, p. 3)

40. P. 3 line 43 '..to describe the geospatial access...' needs to be rewritten
This sentence has been rewritten. Instead of framing our objective as "to describe the geospatial access…" it is now described as "to estimate the difference in travel burdens, measured as distances and times…" (Introduction, p. 3)

41. P. 4, line 7, '...geospatial analysis of knowledge of official language...' is unclear? Is this meant?
We have revised this sentence as follows: "We conducted a descriptive cross-sectional geospatial analysis to estimate neighbourhood-level travel times to language-concordant primary care for French-only speakers and the general population in Ottawa, Ontario." (Study Design, p.4)

42. Under Participants, p. 4 started with n=4,997. Did the steps described reduce this n? I see it comes later but mentionhere?
Yes, we have edited the text to clarify the steps that brought the sample down from n=4,997 to n=869. (Study population, p.4)

43. P. 4, '50 kilometers of ...'. Is this a buffer around polygons or a centroid of the city?
It was a buffer. This has been clarified to read "...within a 50-kilometer buffer of Ottawa's city boundaries…" (Study population, p.4)

44. P. 5 line 5 '...indicating...' should be '...indicated...' – 20% physician
This section has been completely rewritten. (n/a)

45. P. 5 lines 9-10 approximately, '...as the geographical centre...'. Is it meant that the # of people in a DB are assigned that centroid?
Yes, when measuring travel burden we assumed that each resident's trip started from the centroid of their dissemination block (DB). We have rewritten this in a section called Geospatial Analysis that more clearly addresses this point.
(Geospatial analysis, p.5)

46. P. 5, line 11-12. Used Google Geocoding API. This is not open source as opposed to the Valhalla...? How many addresses geocoded?
Correct, Google's Geocoding API is not open source. It is, however, free within limits (it was free for up to 20,000 addresses per month last we checked). We geocoded all physician addresses, and have edited the text to make this clear.
(Data sources and collection, p.4)

47. It should be made clear that the methodology for the 3rd step on p. 5 line 37 about spreading the DA level data on language proficiency to estimate at the DB level is a relatively big assumption.
We have added a statement in our fuller discussion of the algorithm, in Appendix B, to this effect. We note, however, that this is a necessary assumption because

language ability is only available at the DA level and not at the DB level. (Appendix B, p. 10)

48. P. 8, line 21 'In all cases results were strongly significant...'. Just using the word 'results' here is not sufficient.
We have revised this section completely, and we now specify which parts of our findings were significant and how. (Results, pp.6-7)

49. What about a map of physician locations mentioned in Figure 1? If too many points a density map? I understand that there is an online map which I wonder why the clustering used in that way. Can precise location of physicians not be shown?
There are indeed too many physicians to show as points on a reasonably-sized publication-ready plot. Because precise physician locations were not our primary study object, and because our paper is already quite rich in visualizations and space constraints, we direct readers to the online map where the locations of all family physicians can be seen precisely by zooming in to a specific area. Furthermore, we provide exact addresses and contact information (phone, fax) for all community-based family physicians with offices in Ottawa (see www.docmapper.ca and www.trouvezunmedecin.ca). (n/a)

Reviewer 2: Dr. Aisha Lofters
General comments (author response in bold)

50. For an international audience, the authors might want to provide a bit more context in the background on the province of Quebec, the official languages of Canada, etc. This is touched upon at the beginning of methods but might be better suited for the introduction.
We have added text near the beginning of the introduction to help international readers, briefly describing Canada's multicultural and officially bilingual status, and the regional linguistic variations in Ontario and Quebec, and the city of Ottawa's proximity to the border with Quebec. (Introduction, p.3)

51. Although this may not have been feasible with existing data, it would have been interesting to examine travel time by transit. Quality and availability of transit can have a significant effect on travel time.
This response parallels response #23 above.
This is an excellent question that requires further study. Including public transit would make the analysis more robust, but also more complex (both theoretically and computationally). We have it in mind for a future analysis.
In the meantime we have listed this as a limitation. (Limitations, p.7-8)

52. Were the French-only speakers excluded from the general population?
This response parallels response #23 above.
For physicians, all physicians reported competency in English.
For the general population, it is true that some non-English speakers will be included. We have included this as a limitation. (Limitations, p.7-8)

53. It is quite surprising to me that of 5,000 physicians, less than 1,000 were family physicians, as my understanding is that roughly half of doctors in Ontario are family doctors (e.g. see https://www.cma.ca/sites/default/files/pdf/Physician%20Data/01-physicians-by-specialty-province-e.pdf). Can the authors comment on this?
This response parallels response #31 above.

There is always the risk of misclassification. However, on the one hand we have transparently outlined our inclusion criteria; and on the other hand, recall that this is our identified population of family physicians providing family medical services to the general public. Some family physicians work in settings that we excluded (e.g. sports medicine clinics, in long-term care homes, etc.). Ottawa is also home to a number of tertiary-care hospitals and specialized medical clinics that are staffed by a large number of specialists, so the proportion of family physicians will likely be lower here than the overall provincial average. (n/a)

54. Although there are differences in travel time, the driving times are in the range of 2-3 minutes overall and 10-12 minutes for rural areas. Can the authors comment on the "clinical" significance of these times?
This response mirrors response #2 above.
We have revised the manuscript in two ways to address concerns about clinical significance and the magnitude of the burdens and inequities we found. First, to avoid over-interpreting, when discussing our overall results, we now emphasize that the difference between French-only speakers and the general population is statistically significant but modest. Second, we highlight that there are geographical pockets of much higher travel burdens which could have real clinical impacts on patients, especially those with accessibility issues.
This more nuanced presentation lets us acknowledge that the median difference is small but statistically significant, while not losing sight of some impactful outliers. (This new framing is found throughout the Results and Interpretation sections, pp. 6-8.)

55. In future directions, consider discussing the use of interpreters. Interpreters are likely quite under-used within our healthcare system.
We have added a sentence considering interpreters to the Future Directions section. (Future directions, p.7)