

Article details: 2022-0031

Title: Profiling a COVID-19 hot-spot: lessons from the South Asian community in Ontario

Authors: Sonia S. Anand MD PhD, Corey Arnold PhD, Shrikant I. Bangdiwala PhD, Shelly Bolotin PhD, Dawn Bowdish PhD, Rahul Chanchlani MD MSc MBBS, Russell J. de Souza ScD RD, Dipika Desai MSc, Sujane Kandasamy PhD, Farah Khan, Zainab Khan, Marc-André Langlois PhD, Jayneel Limbachia, Scott Lear PhD, Mark Loeb MD MSc, Lawrence Loh MD MPH, Baanu Manoharan BSc, Kiran Nakka PhD, Martin Pelchat PhD, Zubin Punthakee MD MSc, Karleen M. Schulze MMath, Natalie Williams MLIS, Gita Wahi MD

Reviewer (First review): Name withheld / Manitoba

General comments (author response in bold)

In this article, the authors describe their COVID study involving 3 main sources of data – basic demographic data collected at time of enrollment, dried blood spots for antibody analysis, and survey responses from a subset of enrollees. This study focuses on the South Asian population in Peel, Ontario (Brampton Area, in particular). It shows that the prevalence of COVID in this population, as measured both by self-report and seroprevalence is high at over 23%. The report is unique because it is not just a sero-survey – the Authors also include demographic and survey responses. Unfortunately, the 3 data sources are never combined in the paper.

The authors attempt to define the South Asian “hot-spot”, and I think the data are there to do so, but they fall short in their discussion. More effort at inserting the findings of this paper into context of previously published work and surveillance reporting will greatly improve the impact of this work. This Reviewer is of the opinion that more research into the experiences of BIPOC communities and their impacts on health are essential to informing more equitable practice and equal health outcomes.

1. Definition of South Asian – You refer to census 2016 data. How does your definition of South Asian match theirs?

Our definition of South Asian ethnicity was self-reported and defined by parental South Asian ancestry from the Indian subcontinent, Africa, Caribbean, and Guyana. These are virtually identical to the 2016 Census, which is self-reported ethnicity, defined as South Asian (e.g., East Indian, Pakistani, Sri Lankan, etc.).

Requirement:

Add a sentence to the methods indicating what census data you used (i.e. Ethnic Origin? Visible minority?) and how it compares to your definition.

This has been added.

2. Recruitment methods – please provide more information on your recruitment methods.

Despite the supplementary information, this reviewer lacks an understanding of the make-up of people who did/didn't respond to the survey, why a small number of respondents were recruited outside of vaccination sites, and what effect the choice of recruitment site has on the sample. What

This is essential for any BIPOC community research and it is well accepted that reporting on a certain community can only happen when that community is involved in the research. Were any steps of this project informed by community leaders? If there

was no real attempt at engagement, then that research should be considered unsafe to publish.

Unfortunately, we are unable to provide information on who did not respond to the survey, because we approached people directly at the vaccination centre. People that were not interested in participating also did not want to provide any additional information. We have now added more information regarding our recruitment approach. We have worked with this population for > 15 years and all of our study staff at recruitment centres were South Asian, who were fluent in multiple South Asian languages. Specifically, we write: “Community engagement was performed by building upon the research team’s long-standing work in the South Asian community, social media, and recruiters were of South Asian origin, who spoke multiple South Asian languages.”

Requirements:

In the Discussion, provide contextual information around vaccine uptake at the time of the study.

Explain community engagement processes in methods to convince the reader that these studies were conducted in a good way.

As mentioned above we have worked with this community long-term. This has been added on Page 6 under Recruitment “Community engagement was performed by building upon the research team’s long-standing work in the South Asian community, including our research collaboration with Peel Public Health, and our strong relationships with South Asian advocacy groups. In addition we advertised the study through social media using multiple South Asian languages, and our recruiters were of South Asian origin who spoke multiple South Asian languages.”

3. Limitations – some limitations were overlooked, and some may be addressed with more analysis

a. Survey respondents

Are there data available through Peel or Ontario Public Health around the demographics of the people getting vaccinated during recruitment? What were the inclusion/exclusion guidance at the time? What proportion of the population were singly/doubly vaccinated?

During the 3rd WAVE the Peel Region was designated as a hot-spot, as per the Ontario.ca website. As outlined below the eligibility changed over the course of early April to July (the study period), and by July 71% of Peel region adults had at least one dose of the vaccine.

b. Educational background

Respondents with lower education levels are notably absent. Does this reflect more the make-up of the region, or the types of people more likely to respond to a survey?

17.5% of our participants had a high school education or less. This is lower compared to 28.1% reported for the Peel Region population in the 2016 Census.

https://www.peelregion.ca/planning-maps/censusbulletins/2016-labour_education_mobility-bulletin.pdf

This is consistent with South Asian immigrants to Canada who in previous studies have been well educated. It is also possible that our data may reflect our recruitment from vaccine centres predominantly, perhaps lower educated South Asians would be less inclined to be vaccinated.

c. Household size and make-up

Was there more than 1 respondent per household in this study? If so, how many and how would this affect data?

Yes this was possible, as we indicated above and added to the paper “916 participants represent 770 unique households, with 640 of the households having a single respondent.”

d. Integration of findings

How do the survey results around attitudes and feelings correspond to a person’s COVID experience? (infection, vaccination, etc.)

Participants who had COVID by self-report did not appear to be less vaccine hesitant compared to those without prior infection.

Requirements:

In Methods, indicate the vaccination restrictions that were in place at the time of recruitment. Also indicate the proportions of the population in general who were partially-, fully-, or un-vaccinated. Add this context of recruitment to limitations (suggestion).

Between April and July 2021 during our recruitment period in the Peel Region, vaccines eligibility evolved swiftly in the Peel region:

- April 1, 2021 – COVID-19 vaccines available for individuals with highest risk health conditions and seniors 65+

- April 9, 2021 – COVID-19 vaccines available for 50+

- May 6, 2021 – all Peel residents age 18+ were eligible to receive the COVID-19 vaccine

Such that as of May 6, 2021 all adults could be booked for vaccination as Peel was designated a hotspot.

<https://www.peelregion.ca/health/professionals/tools/updates2021.htm>

The proportion who were partially or fully vaccinated at the start to end of our recruitment period have been added to the manuscript on Page 14, and were as follows:

10.6% with at least one dose – April 2021

1.5% fully vaccinated – April 2021

70.6% with at least one dose – July 2021

59.3% with at least two doses – July 2021

Explain limitations around survey respondents.

In Results or Supplementary section, incorporate analysis of the household income by household size.

We have added this to Table 2, and indeed we observe the lower income strata who have a higher household size, have a higher seropositivity at 28% as compared to the highest income category at 16.8%.

Indicate if more than one person/household was recruited. If so, describe the limitations/biases that may be introduced into the study. If only 1 person per household was recruited, add a sentence to the methods.

In response to the other reviewers, we have added the number of household where more than 1 member participated in the study, and adjusted for this clustering in the comparisons by demographic factors for seropositivity. (Table 2)

Incorporate COVID data into survey responses. This is a clear missed opportunity.

We were unclear what this comment referred to as we have incorporated COVID prior infection data Table 2 and show seropositivity by infection history.

4. Entire Survey, timing of survey – how might responses to survey be swayed by timing of survey. It appears that people were surveyed at a lull between waves. What were circulating variants at the time? How was vaccine uptake?

We have responded to vaccine uptake in the question above. The recruitment occurred during WAVE 3 therefore not during a lull. By the end of our survey period approximately 71% of Peel adults had received one dose of the vaccine. Participants may be more inclined to endorse covid rules and reduced hesitancy given the large proportion recruited from vaccine centres.

The proportion who were partially or fully vaccinated at the start to end of our recruitment period was as follows:

10.6% with at least one dose – April 2021

1.5% fully vaccinated – April 2021

70.6% with at least one dose – July 2021

59.3% with at two doses – July 2021

Requirement: in the introduction include 1 or 2 sentences around the COVID context at the time of the study.

The edited introduction indicates that the Peel Region was designated as a hot-spot and our study recruitment coincided with the third wave and mass vaccination roll-out.

5. Analyses

a. Infection data – there is no indication of timing of infection relative to sample collection and age. These are important to contextualize antibody measurements

This is correct. As COVID infection was by self-report, we rely on the antibody titres to determine seropositivity. Participants with a past COVID infection were significantly more likely to be seropositive as shown in Table 2. Seropositivity is age and sex standardized to the Ontario population. We have not performed a detailed analysis of the timing of natural COVID infection and antibody titres or to age as of yet.

b. Seroprevalence – how do the results of this study compare to others?

This is described in the Discussion section. Our seropositivity rate is comparable to other high-risk settings, including the incarcerated population, who live in close proximity to one another.

c. Cumulative Incidence – confusing and absent from discussion.

This is difficult data to find for the South Asian population because ethnicity is not routinely collected by health administrative data. It is inferred using name algorithms. The term cumulative incidence comes from the Ontario COVID-19 data tool has daily case rates from April to July 2021. The ICES file only shows up to date data for the cumulative incidence by Forward Sortation Area.

d. Multivariate analysis – needs to be attempted.

This was attempted and no significant determinants of seropositivity reached conventional significance.

Requirements:

Analyze serology by age and time since infection. If time since infection unavailable, analyse serology by age and infection yes/no. Include in the Supplementary section.

This appears for covid infection and seropositivity in Table 2. This shows that those previously reporting COVID infection seropositivity was 78.4% versus those without a history of infection at 13.5%.

In Discussion, explain why findings are novel/relevant in the context of COVID disease and incidence in Peel/Brampton.

We believe the manuscript reflects this in-terms of a high-risk population for SARS CoV-2 infection and the seropositivity is as high as an incarcerated population from Quebec. We also show that there is a high proportion of our study sample living in multigenerational households and as essential workers. The seropositivity was numerically higher in the lower income quintile. This is important information for future wave or pandemics for policy and planning.

Unless can provide proper explanation for the reason why this analysis was done, what the figure means, and how this contributes to your overall findings, remove from paper! If you want to add a figure around seroprevalence, use the analysis suggested above.

We show that certain postal codes which is a proxy for income have high infectivity rates- making the point of the socioeconomic gradient within a high-risk ethnic group being a significant factor.

In its current state, the article does not appropriately tell the story of the paper's title. If you are wanting to publish an article describing a COVID hotspot using multiple variables, then you must attempt multivariate analysis. This author suggests logistic regression after transforming the seroprevalence data to a binary positive/negative result. Results should either be provided in detail in the Results or Supplementary sections and MUST be described in the Methods and Results sections.

Thank you for this comment we have modified the Title of the paper and objective somewhat and emphasize the descriptive components of the population along with the factors associated with seropositivity.

6. Other – the Figure 2 legend reference is incorrect.

We reviewed this and it is accurate.

(Second review): Name withheld / Manitoba

The authors have made some major changes to the paper as suggested previously by this reviewer, however some challenges remain. While the issues involve relatively minor fixes, they are crucial for the paper to be of a high enough standard to pass peer review. Given previous review, this response will be brief.

1. Figure 2

The reason for this analysis and the meaning of the results are never discussed in the paper. THIS FIGURE NEEDS TO BE REMOVED OR EXPLAINED.

Response: We have expanded our description of this figure in the following ways: We describe it in the Methods section (Page 8), Results describe the correlation (Page 10), and in the Discussion (Page 13). We hope this is satisfactory to you.

Statistical Methods:

The raw proportion of participants who had evidence of prior SARS-CoV-2 infection was examined graphically versus the infection rate in similar forward sortation areas (FSA) reported by the Institute of Clinical Evaluative Sciences with a line of best fit drawn, and Pearson r value calculated. (Figure 2)

Results:

Seropositivity: The raw proportion of seropositive cases by geographic region (FSA) are plotted versus the cumulative incidence of SARS-CoV-2 infection rate and show a moderate association ($r=0.35$; $P=0.24$). (Figure 2)

Discussion

Prior to the COVID-19 pandemic, ethnicity data were not routinely collected or made publicly available in Canada (16). As a surrogate, in areas where a single ethnic group is concentrated, infection and hospitalization rates was examined by postal code, and then inferred to be representative of high-density ethnic populations (5) While our seropositivity data by FSA shows a moderate correlation with the cumulative incidence of SARS-CoV-2 infection in Peel (Figure 2), overall our data provides direct evidence of the high infection rate suffered by South Asians in this region. Our data suggests therefore that the true exposure to SARS-CoV-2 was appreciably higher than the reported cumulative incidence of disease. Further, we observed that some communities with low to moderate reported cumulative incidence may have strikingly high seropositivity. We demonstrate that the seropositivity rate was higher in men compared to women, those with prior COVID infection, lower educational attainment, lower income per household size, those living in Brampton, and in multigenerational households.

2. References

Please update references that have been published and are no longer in pre-release stage.

Ensure the hyperlinks are functioning (example: reference 21 link is broken)

Where possible, replace news articles with scientific peer-reviewed articles. This is a must! If your reference is from a news source, state explicitly in the text that the information was taken from media sources. Example from Background:

“South Asians (i.e., people who originate from the Indian subcontinent) are the largest non-white ethnic group in Canada (1) and have been disproportionately affected by COVID-19 (2)”

The reference (2) is a CBC news article and is not a scientific peer-reviewed publication. It is misleading not to provide the source in the text of the paper.

Response: Thank you for this observation and we have now updated the references and have reduced media reports to 1, and indicate this as such in the text in the way that you suggested.