Inequities over time in COVID-19 infection and COVID-19-related hospitalizations/deaths

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Introduction

Throughout the pandemic, researchers working in various regions have shown that COVID-19 infection rates are disproportionately higher for racialized and low-income persons.[1] In July,[2] and November of 2020,[3] data from Toronto Public Health showed that approximately 80 per cent of new COVID-19 cases in Toronto were among racialized persons, even though they make up only 52 per cent of the population of the City of Toronto. A similar investigation from Peel Public Health in March 2021 revealed that 83 per cent of new COVID-19 cases in Brampton, Caledon, and Mississauga were racialized persons, although they make up only 59 per cent of the population in these areas.[4]

Evidence that considers the whole province of Ontario also showed an association between neighbourhood ethno-cultural diversity and COVID-19 infection rates, and COVID-19 related deaths, in May of 2020.[5] Work at the area level has also suggested moderate improvements in terms of population inequities in access to vaccines.[7] It is unclear whether changes in access to vaccination have translated into changes in COVID-19 infection rates, and rates of hospitalizations/deaths from COVID-19.

Methods

Data on cumulative rates of infections and hospitalizations/deaths for FSAs were accessed from Institute for Clinical Evaluative Sciences (ICES) for March 27, May 8, and June 20, 2021.[9] These data were linked to 2016 census characteristics for FSAs.[a] Correlations between neighbourhood characteristics and COVID-19 outcomes were computed. Note that these rates exclude people living in long-term care facilities. Note we use the term 'racialized' to refer to specific racial groups, but 'not-visible-minority' to speak of the group that leaves out all racialized groups except Indigenous, since this is the category used in the 2016 census.

Findings

In Figure 1, we can see that associations between neighbourhood demographic characteristics and COVID-19 infection rates remained virtually unchanged over the observation period. Areas with a higher per cent South Asian, Black, Southeast Asian, and Latino all had higher infection rates, controlling for other factors. Areas with a greater per cent of Chinese residents showed lower overall COVID-19 infection rates. The association with Southeast Asian diminished slightly, but for all other groups, the association remained consistent throughout the observation period. Again, note that although areas with a greater per cent racialized populations generally had higher COVID-19 infection rates, the reverse was true for areas with a greater per cent of Chinese residents. There was no association with per cent Low Income Cut-Off (LICO) after taking controls into account.

Using predicted values from the models, Table 1 shows the average expected rate of COVID-19 infection rate for areas with the highest concentration of each racialized group. That is, the rate of infection for the highest decile. It then compares this rate to areas with the highest per cent non-visible minority, to

[a] Outcomes were modeled using random effects model with time points nested in FSAs, where the outcome (a proportion) was logit-transformed to bound it at 0 and 1. These controlled for time local age composition, race, region, 'hotspot' designation, an interaction between time and hotspot, and poverty rates (using the Low-Income Cutoff/LICO). Successive models included interactions between time and FSA racial/poverty characteristics, one at a time.

estimate the size of the gaps by area. The results show that except for Chinese, in all racialized groups, the rate of cumulative COVID-19 infection rates by June 20 were more than double compared to heavily non-visible-minority areas.

In Figure 2, considering COVID-19-related hospitalizations and deaths, many inequities worsened during the observation period. Associations between per cent South Asian, per cent Black, Southeast Asian, and Latino and COVID-19-related hospitalization/death all became stronger between March 27 and June 20. That is to say, inequities by race worsened for these four groups. At the start of the observation period, higher-poverty areas showed lower rates of hospitalizations and deaths. However, by June 20, there was no significant correlation between LICO rates and COVID-19 hospitalization/death rates.

Table 2 repeats the analysis from Table 1, but looks at hospitalizations and deaths. Here, areas that had the highest per cent Black and Latino had approximately double the rate of COVID-19 hospitalizations and deaths compared to areas with the highest per cent not-visible-minority. In terms of racial composition of the FSA, all groups had higher rates of hospitalization/death compared to the not-visible-minority groups.

Discussion

The results here show that over the course of over two months neighbourhood inequities by race worsened in the case of hospitalizations/deaths. The per cent of an area that was South Asian, Black, and Southeast Asian all had a stronger correlation with hospitalizations/deaths in June, when compared to April.

As a retrospective on this recent period, it is clear that it is more important than ever to quantify the extent to which the burdens of COVID-19 were felt by racialized and low-income *individuals* – something that a neighbourhood-level analysis can only hint at without falling prey to ecological fallacy (applying conclusions found at an area level to an individual level). Unfortunately, as socio-demographic data collection has not been mandated and has been unevenly applied to vaccination efforts, this type of analysis is not yet possible.

This analysis provides further evidence that the inequities exposed by the COVID-19 pandemic require ongoing attention. Previously suggested mitigation efforts include an increase in resources to community-led vaccination efforts and the continued prioritization of vaccine doses to hot spots. Widespread policy changes to protect essential workers, such as mandating additional paid sick days, continue to be championed as a necessary public health measure.

We should be mindful of these inequities while seeking to meet the needs of people suffering the long-term consequences of COVID-19 infection. Although estimates are still uncertain in Ontario, data from other locations is not encouraging. A recent government survey in the UK estimated that up to two million people in England are experiencing some form of 'long COVID-19' symptoms, with lingering symptoms more likely among low-income people.[10] A report using health care claims in the United States estimated that approximately 23 per cent of patients who had COVID-19 also had long-lasting COVID-19 symptoms, with the most common being pain and trouble breathing.[11]

It is reasonable to assume that if infection and hospitalization were disproportionately experienced by racialized persons, the burdens of long-term COVID-19 symptoms will fall upon those communities.

Deaths and loss may also contribute to individual and community-level trauma as well as re-affirm systemic racism in the medical system towards racialized populations, especially Black and Indigenous populations.[13] If little was accomplished to reduce the immediate effects of COVID-19 on racialized people and populations, we have a responsibility to reduce the burdens created by COVID-19's legacy. The Province should therefore work immediately to develop an equity-focused strategy for addressing long-term COVID-19 symptoms with racial inequities front and centre in their discussions, with representation from those communities at the table to guide their work. Without this, whatever we do, the recovery from COVID-19 will continue to widen inequalities.

Figure 1. Associations between COVID-19 infection rates and neighbourhood characteristics (racial composition and per cent below Low-Income Cut-Off/LICO)

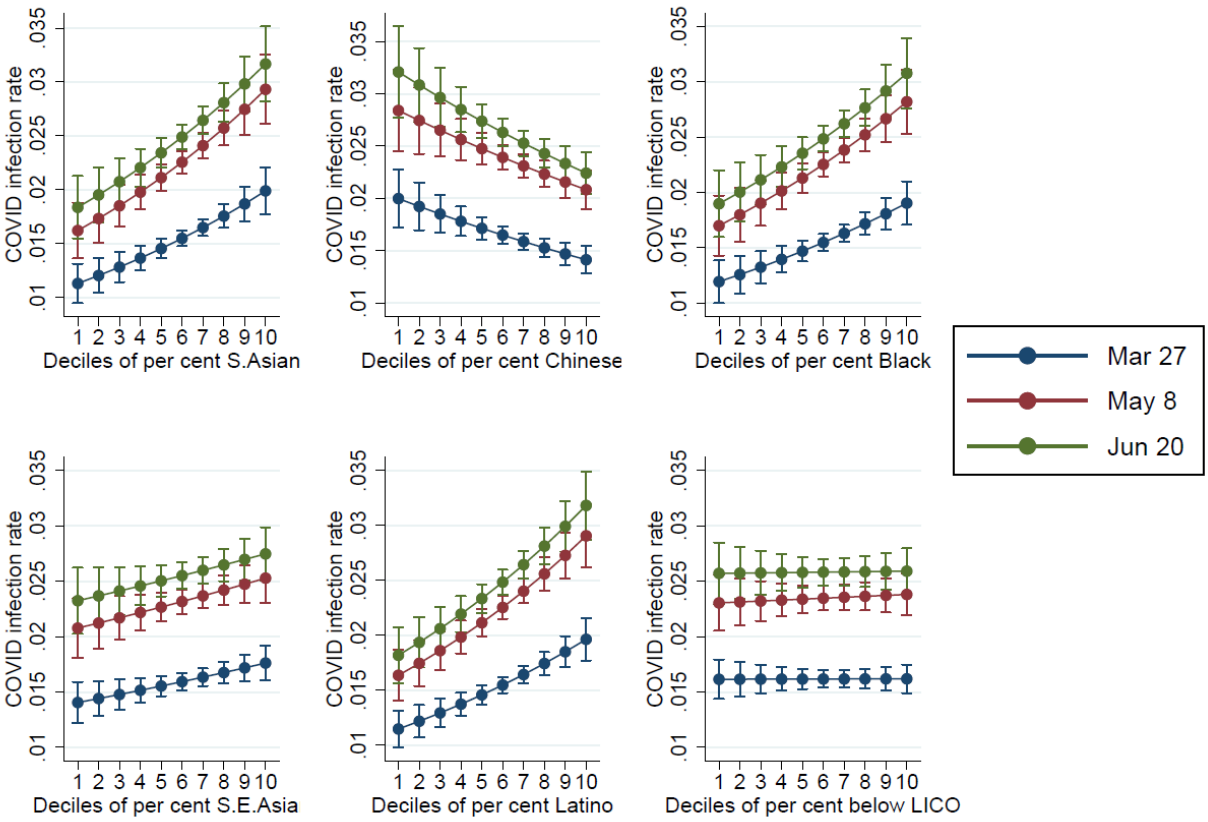

Table 1. Relative rates of COVID-19 infection rates by June 20, by racial groups. Model-based estimates.

	Not vis. Min.	South Asian	Chinese	Black	S.E. Asian	Latino
Predicted rate in areas with highest per cent of group (i.e. top decile)	1.3%	3.2%	2.2%	3.1%	2.7%	3.2%
Compared to not-visible-minority areas, these areas infection rates were…	-	1.9% higher	0.9% higher	1.8% higher	1.4% higher	1.9% higher

Figure 2. Associations between COVID-19 hospitalization/death rates and neighbourhood characteristics (racial composition and per cent below Low-Income Cut-Off/LICO).

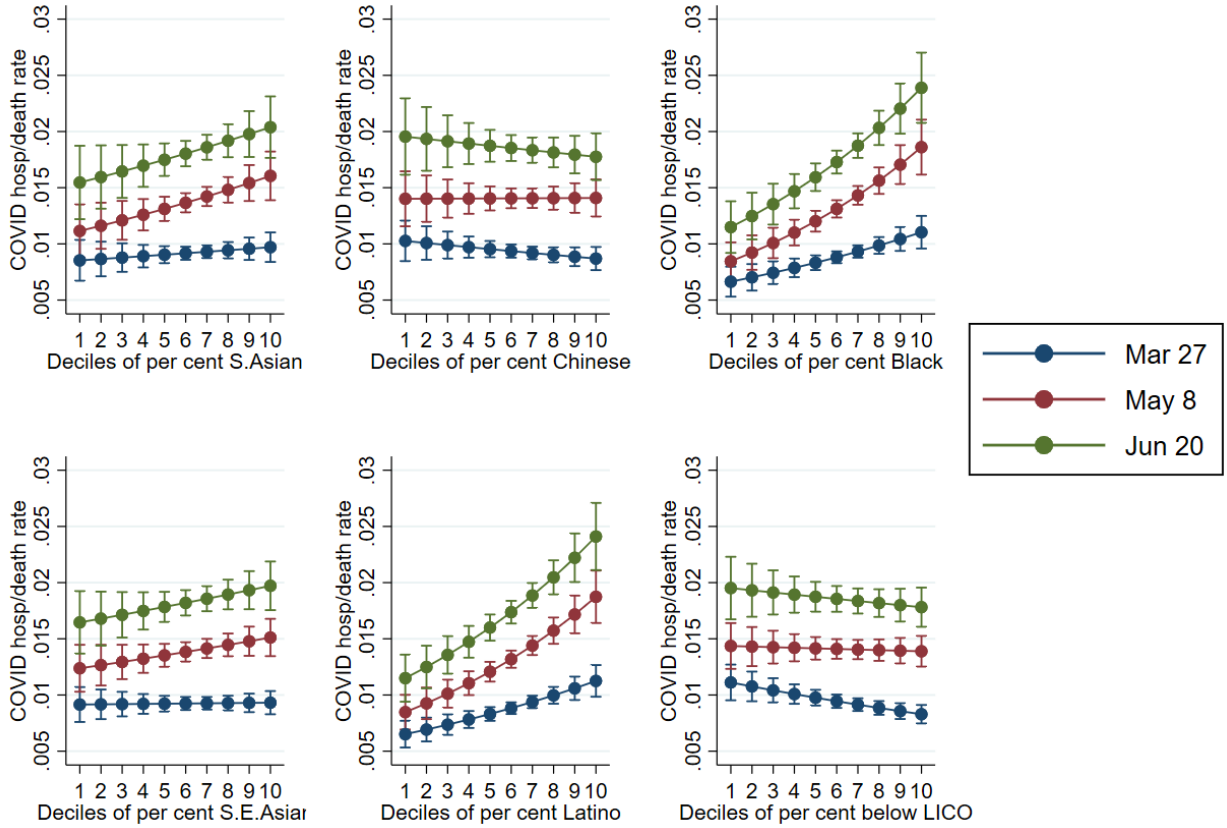

Table 2. Relative rates of COVID-19 hospitalization/death rates by June 13, by racial groups. Model-based estimates.

	Not vis. Min.	South Asian	Chinese	Black	S.E. Asian	Latino
Predicted rate in areas with highest per cent of group (i.e. top decile)	0.8%	2.0%	1.8%	2.4%	2.0%	2.4%
Compared to not-visible-minority areas, these areas hospitalization/ death rates were…	-	1.2% higher	1% higher	1.6% higher	1.2% higher	1.6% higher

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