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Title	COVID-19 demographics, acute care resource use and mortality by age and sex in Ontario, Canada: a descriptive analysis
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Reviewer 1	James Downar
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General comments (author response in bold)	The methods indicate that the "Mortality was also estimated for individuals who were never hospitalized."- since a large proportion of Ontario's deaths occurred in LTC, I was hoping for some clarification about how this was estimated. I couldn't find this explanation in the manuscript but may have missed it. **We have clarified how the mortality was extracted from the dataset by filtering out the variable fields from the CCMplus dataset. Mortality and LOS were estimated by acute care level: 1) Ward (i.e., hospitalized but did not receive ICU care or IMV), 2) ICU (i.e., required ICU care but no IMV) and 3) Ventilation (i.e., required IMV). Mortality was estimated based on LTC residency, and by hospitalization status. For mortality and LOS, we only included individuals with resolved outcomes (resolved, fatal), and complete hospitalization data.** The lack of data about measures of structural vulnerability and social determinants of health is disappointing given how much discussion has circled around the disproportionate effect of COVID on lower income, racialized and marginalized populations, especially in the Greater Toronto Area. This data may not be available to the authors but if it is, it would be very helpful to see. If not, there should probably be an explanation of this limitation somewhere. Either way, even some expression of odds ratios/adjusted odds ratios for even the factors here (age, sex) would be appropriate. **Thank you for this comment. We agree that social determinants of health (SDOH) are important and are useful to understand for public health interventions and policies. Much of the discussion on social determinants of health has centered around risk of infection, and not outcomes. We do not have the data available to comprehensively describe outcomes by specific SDOHs (e.g., geography, socioeconomics, etc.). We have revised the limitations in the Discussion section to explain this. In this revised manuscript, we present crude odds ratios for males and females > 70 years of age compared to < 70 years of age for non-LTC individuals (i.e., a potential age cut off for early stages of vaccination programs) and LTC individuals for hospitalization outcomes only. Ratio statistics for other outcomes are not presented due to lack of data to adjust for confounding, which then can be misinterpreted.** The observed reduction in mortality/hospitalizations etc. over time is very unlikely to be related to improvements in care. Only corticosteroids appear to reduce mortality, and even then only in the subset of those who require oxygen. This would not have affected the % who required hospitalization, and the results of RECOVERY were only available in July, long after the improvements in outcome seemed to plateau. Ventilator strategies may also have changed but only a small proportion were ventilated so this would not explain the observed reduction in mortality (13% or 5% to 1%).

	Thank you for this comment. While evidence is still evolving, changes in clinical practice, especially in critical care, likely played some role. The decision when to intubate patients with COVID-19 has changed, the more liberal use of high flow oxygen, steroids, proning, and changes in how and when patients seek care all may be potential causes of reduced critical care resource use. A recent National Post article interviewed many leaders in Critical Care in the country, similarly indicating some contribution of better understanding of COVID-19 disease and resulting practice change to mortality. (Reference: https://nationalpost.com/health/more-people-are-surviving-severe-covid-19-but-doctors-arent-exactly-sure-why). However, we agree that at this point clear evidence does not exist and added this to the Discussion section. I would think that there are two very likely explanations for what we are seeing. The first is that the detection/case identification rates changed dramatically over the first few months of the pandemic. In March-May positivity rates were often above 8% and we were struggling to reach 10,000 tests per day. In July and August our positivity rate fell below 1% and we were doing more than 30,000 tests routinely. See attached graphs (obtained from https://covid-19.ontario.ca/data#testing). Likely, we were missing many of the less symptomatic patients who didn't require hospitalization, but still capturing the sicker, hospitalized patients who were most likely to die. So this would be a denominator problem, not a numerator problem. **Thank you for this comment, we tried indicating this in the Discussion section but may not have been clear enough. We have revised the Discussion section accordingly to suggest that the number of cases (denominator) resulting from the increased testing would mostly affect the proportion of people hospitalized. The remainder of the outcomes presented in this analysis use "hospitalizations" as the denominator and should not be affected by changes in testing.**
Reviewer 2	Srinivas Murthy
Institution	Department of Pediatrics, British Columbia Children's Hospital,Vancouver, BC
General comments (author response in bold)	Complete case analysis. Analysis limited to where dataset complete, but no information on burden of missingness or excluded patients included. **Please refer to our comment from the biostatistician, we have revised the Discussion section to discuss the implications of the excluded patients. We have also revised the Methods section to provide a reason for exclusion (i.e., age was missing, or fell outside of accrual period, pre- and post.)** LTC analyses. I had to subtract numbers myself to figure out the i) number of LTC deaths that occurred without getting to a hospital; ii) number of LTC patients who made it to hospital, and died without being admitted to an ICU. **Thank you for pointing this out. We have made this clearer in the Results section of the revised manuscript.** LOS: For ICU patients, it's reported 6 days pre- or post-ICU hospitalization. Is it possible to break down this data by pre- or post- to better understand patient trajectories. **We have broken this down by pre- and post-ICU in the Results section. We have also added a sentence on the pre-ICU LOS in the ward for those who**

	stay in the ward for at least a day (i.e., these individuals deteriorate and require ICU care on average 4.09 days post-ward stay). Page 10L10: Would be hesitant on attributing improved outcomes to prone positioning, given current state of evidence. Comment: Page 10L16: Would be hesitant on attributing improved outcomes to mask use resulting in lower viral inoculum at time of infection **We agree that both statements are hypothesis generating at this point, supported by early evolving evidence. The use of prone positioning for both intubated and non-intubated patients is becoming more wide-spread, and there is good evidence to demonstrate benefit for patients with acute respiratory distress syndrome (ARDS). A recent summary of the evidence for proning in COVID-19 was recently published in CMAJ (Reference: https://www.cmaj.ca/content/192/47/E1532). We have revised the Discussion section to highlight that these are hypothesis generating statements and that the evidence to support these hypotheses does not yet exist.** Table 2: Appreciate the need for aggregating small cells; however, given the province-wide completeness of the dataset, describing the total burden of childhood disease has important policy implications and would be useful to present. At the same time, Figure 1 can be more easily clustered, given the small numbers in the younger age groups to make it easier to read. **Table 2 has now been replaced by Appendix 7 as described in the next comment's response in agreement with the reviewer's comment on the importance of each tables. We have placed this table in the Appendix. We appreciate the need to understand the burden of childhood disease, but we must aggregate small cells which resulted in the 0 to 29 age group for Table 2 (now Appendix 7). For Figure 1, we wanted to present the key differences between 0-9 and 10-19 years of age as they include very different persons' and their daily risk (i.e., a 18 year-old may go to post-secondary and are able to work, compared to a 5-year old). We disaggregated the data as much as possible for each outcome without violating privacy policies.** Not entirely certain if Fig 2C is useful in interpreting the data. I'm torn as to whether Appendix 7 or Table 2 is a more relevant table for the main manuscript, and am leaning towards Appendix 7 being a more clear explanation of the data, with the 'excluding LTC' analysis important, but not the main aim of this descriptive analysis. **We agree that Figure 2C may not be as useful as shown since proportions are relatively similar across age groups and have removed. We agree that Appendix 7 provides a clearer explanation of the data and have swapped it with Table 2 (which has not been placed in the Appendix).**