

Enhanced Epidemiological Summary

COVID-19 in Ontario – A Focus on Material Deprivation

This report includes the most current information available from the integrated Public Health Information System (iPHIS) and other local case management systems (iPHIS plus) as of June 3, 2020. The data in this report may change as more case reports and case details are received.

Purpose

This is the second report on neighbourhood-level trends related to health equity among laboratory-confirmed COVID-19 cases reported in Ontario who do not reside in long-term care (LTC) settings. The first report focused on the differential impacts of COVID-19 on neighbourhoods with varying levels of ethnic concentration as a proxy for structural racism and discrimination. This report focuses on the “material deprivation” dimension of the [Ontario Marginalization Index \(ON-Marg\)](#), which is connected to poverty and measures the inability of individuals and communities to access and attain basic material needs (e.g., educational attainment, quality of housing).

Similar to the first report, the broad purpose of this report is to help policy makers and program planners to identify populations for which prioritization of public health and health system resources and interventions are needed to mitigate the disproportionate impact of COVID-19.

Details on the overall status of COVID-19 cases in Ontario are provided on Public Health Ontario’s COVID-19 [Data and Surveillance web page](#).

Highlights

- Provincial reportable disease data suggests that population subgroups already experiencing income-related marginalization are disproportionately affected by COVID-19 in Ontario.
- Neighbourhoods in Ontario experiencing the highest levels of material deprivation are experiencing disproportionately higher rates of COVID-19 and related hospitalizations and deaths compared to neighbourhoods that experience lower levels of material deprivation.
- After adjusting for differences in the age structure between neighbourhoods, the rate of COVID-19 infections in the neighbourhoods experiencing the highest levels of material deprivation was almost two times higher than the rate in the neighbourhoods experiencing lower levels of material deprivation.
- People living in neighbourhoods experiencing the highest level of material deprivation were also more likely to experience severe outcomes (i.e., hospitalizations, ICU admissions and deaths) compared to people living in neighbourhoods experiencing the lowest level of material deprivation:
 - Hospitalization rates were 69% higher;

- ICU admission rates were almost two times higher; and
- Death rates were 52% higher.

Methods

ON-Marg and “Material Deprivation”

The material deprivation dimension of ON-Marg is closely connected to poverty. It refers to the inability of individuals and communities to access and attain basic material needs. It uses Canadian census data on income, quality of housing, educational attainment and family structure characteristics to assign neighbourhoods in Ontario to a measure of marginalization.

In this report, “neighbourhoods” are based on the census dissemination areas (DA), the smallest geographic unit of 400-700 residents for which Canadian census data are available. ON-Marg assigns neighbourhoods to one of five levels or quintiles of material deprivation so that each grouping contains 20% of Ontario neighbourhoods. Using the Postal Code Conversion File Plus (PCCF+) version 7B, COVID-19 cases were assigned to neighbourhoods and then quintiles based on their postal code of residence. The quintiles for the material deprivation dimension are ordered from 1 to 5, with quintile 1 neighbourhoods having the lowest level of marginalization (i.e., least deprived) and quintile 5 neighbourhoods having the highest level of marginalization (i.e., most deprived). The populations and other demographic characteristics of the neighbourhoods that comprise each quintile of the material deprivation index are included in [Appendix A](#).

The ON-Marg material deprivation dimension at the census DA level serves as a proxy for individual-level data in this report because complete data on socio-economic status are not yet available in iPHIS and most local reporting systems. As such, trends highlighted in this report apply only to the neighbourhoods from which they arise and cannot be used to characterize individual members of a given area. These broader demographic trends may not reflect all residents of an area owing to the inherent heterogeneity of demographic characteristics which can vary substantially especially across large rural geographies. In order to gain a better understanding of the complex relationship between COVID-19 and material deprivation, collection of data on socio-economic status at the individual level is needed.

Cases in this Report

All cases of COVID-19 reported in Ontario from January 15, 2020 to June 3, 2020 were included in this report, with the following exclusions:

- Cases that reside in long-term care settings as they are not included in the census data from which the material deprivation dimension of ON-Marg is determined. Although these cases represent a large number of the overall cases and deaths, their exclusion ensures appropriate comparisons since long-term care residents are excluded from the material deprivation index. A separate report on COVID-19 among cases in long-term care homes will be released.
- Cases without a reported postal code which is required to assign cases to a neighbourhood-level quintile of material deprivation.

- Cases that reside in regions of the province where census data are not available because they are suppressed by Statistics Canada to protect respondent's confidentiality or due to incomplete enumeration of some Indian Reserves and Settlements.

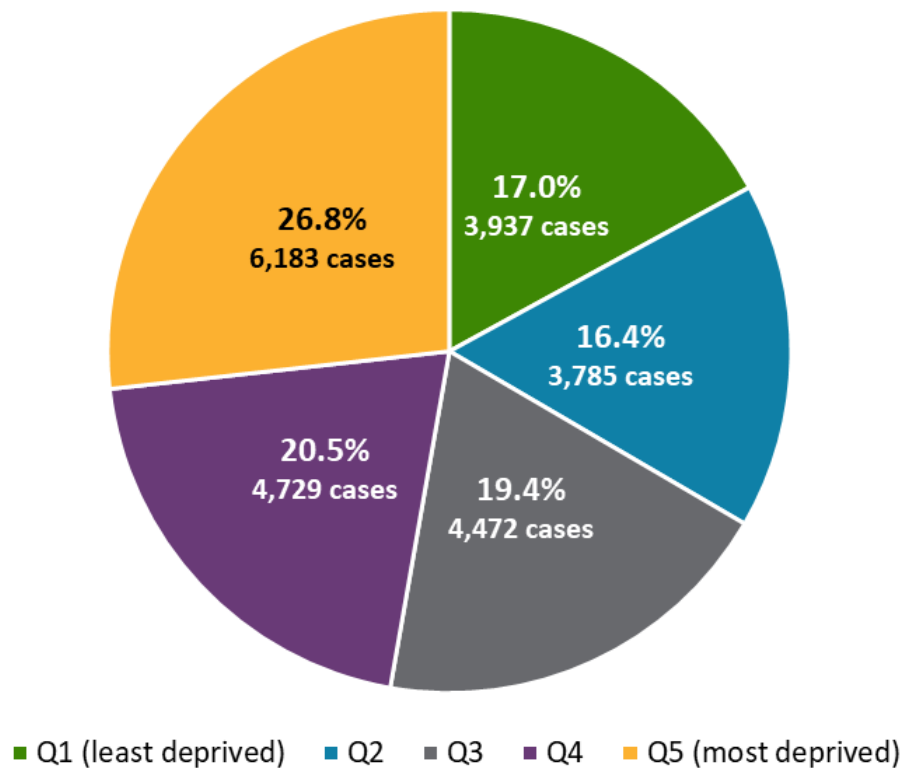
This report therefore includes 23,106 (78.6%) of the 29,403 laboratory confirmed cases of COVID-19 reported in Ontario from January 15 to June 3, 2020. Included among these cases are 2,852 of 3,589 hospitalizations (79.5%), 673 of 773 ICU admissions (87.1%), and 789 of 2,357 deaths (33.5%) reported during this period. [Appendix B](#) provides information on the number of cases reported during this period and the number of cases summarized in this report.

The number of cases and incidence rates for each quintile of material deprivation are presented in this report. Throughout the report, rates have been age-adjusted to remove the influence of age on trends and to allow for appropriate comparisons between neighbourhoods with varying levels of deprivation and differing age structure. A map of the Ontario census geographies that make up the five material deprivation quintiles is shown in [Appendix C](#).

COVID-19 Cases and Deprivation

- From January 15 to June 3, 2020, 29,403 confirmed cases of COVID-19 were reported in Ontario. Among reported COVID-19 cases summarized in this report (n=23,106), one-third (33.4%) resided in neighbourhoods with the lowest levels of deprivation (quintiles 1 and 2), whereas just under half (47.2%) resided in neighbourhoods with the highest levels of deprivation (quintiles 4 and 5). The remaining 19.4% of cases resided in neighbourhoods with moderate levels of deprivation ([Figure 1a](#)).
- Age-adjusted rates of COVID-19 showed a gradient effect, with a steady increase in incidence rate as the level of material deprivation increased ([Figure 1b](#)). Cases residing in the most deprived neighbourhoods (quintile 5), accounted for over one-quarter (26.8%) of cases which corresponds to an age-adjusted incidence rate of 246.3 cases per 100,000 population. This was almost two times the rate in the least deprived neighbourhoods (quintile 1), which accounted for 17.0% of cases for an age-adjusted incidence rate of 130.2 cases per 100,000 population. For Ontario, the overall age-adjusted rate of COVID-19 after excluding cases that reside in long-term care settings was 179.8 cases per 100,000 population.

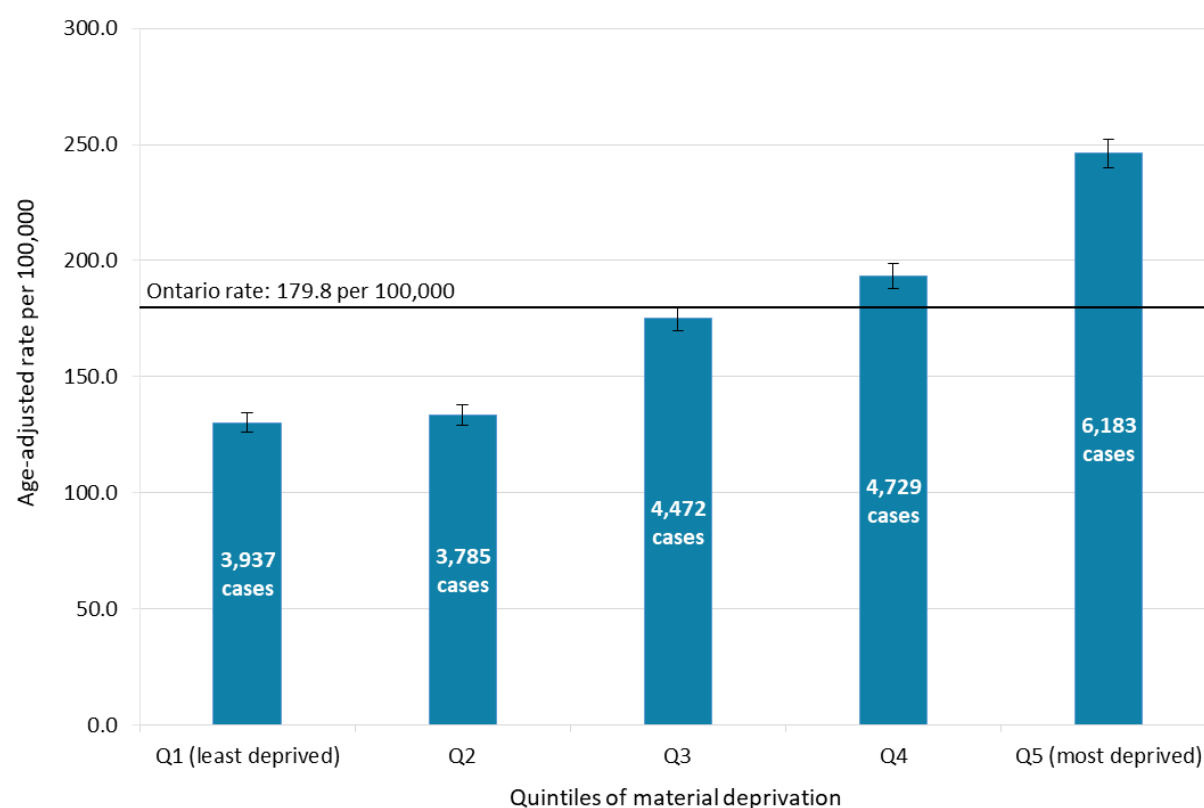
Figure 1a. Percent and number of confirmed cases of COVID-19 for each quintile of material deprivation: Ontario, January 15, 2020 to June 3, 2020 (n=23,106 cases)



Cases that reside in long-term care settings are not included in this analysis.

Data Source: integrated Public Health Information System (iPHIS) database, local case management systems (iPHIS plus), ON-Marg 2016.

Figure 1b. Age-adjusted rate and number of confirmed cases of COVID-19 for each quintile of material deprivation: Ontario, January 15, 2020 to June 3, 2020



Rates per 100,000 population (bar heights) are adjusted for the size and age structure of the population. The upper and lower caps of the lines on each bar show the upper and lower limits (respectively) within which the corresponding rate would occur 95% of the times.

Horizontal line represents the age-adjusted rate for Ontario excluding cases that reside in long-term care settings. Cases that reside in long-term care settings are not included in this analysis.

Data Source: Integrated Public Health Information System (iPHIS) database, local case management systems (iPHIS plus), ON-Marg 2016.

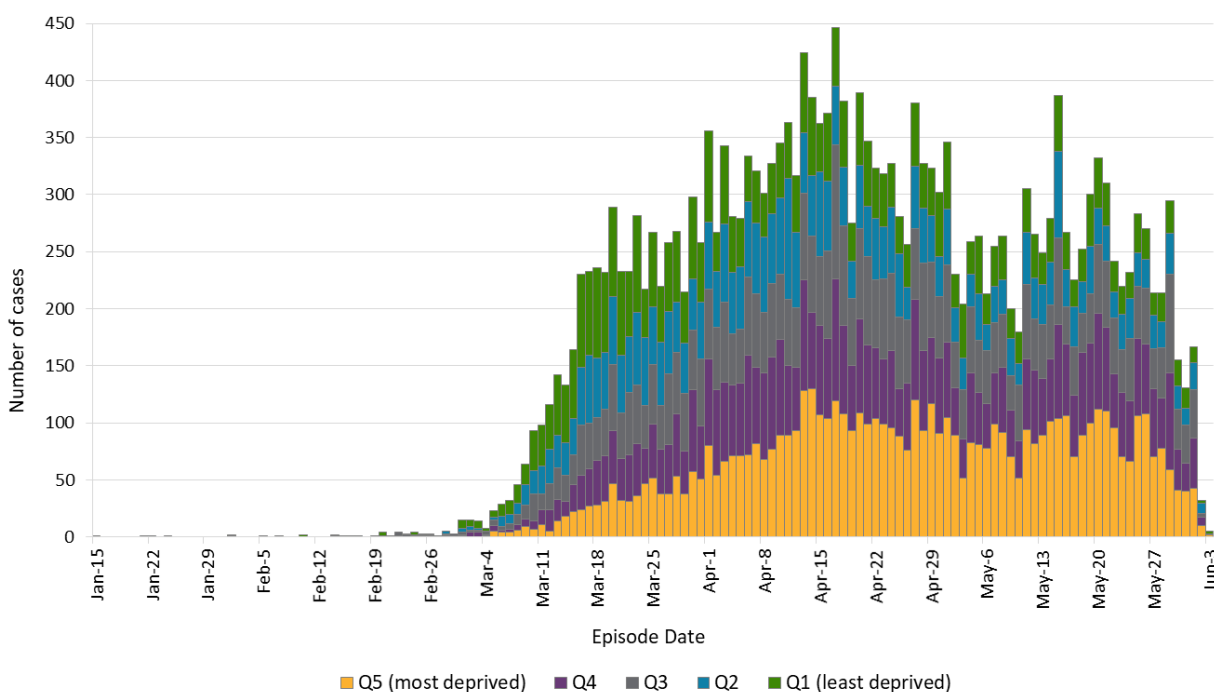
Temporal Trends

The distribution of cases over time is presented based on episode date, an estimate of the date symptoms began. The distribution of these dates over time shows how cases are trending and provides an indication of the period over which cases may have been exposed to SARS-CoV-2, the virus that causes COVID-19.

- [Figure 2](#) shows the daily number of confirmed COVID-19 cases that occurred in Ontario from January 15 to June 3, 2020 by quintiles of material deprivation (23,106 cases). The number of new COVID-19 infections was highest among the least deprived neighbourhoods (quintiles 1-2) during the initial growth in cases occurring from mid-March to early April. During the mid to late April peak, new cases were highest in the most deprived neighbourhoods (quintiles 4 and 5). Since then, case growth has declined in neighbourhoods with low to moderate levels of

deprivation (quintiles 1-3) and the number of new infections has remained elevated in neighbourhoods with the highest level of deprivation (quintiles 4 and 5).

Figure 2. Cumulative number of confirmed cases of COVID-19 for each quintile of material deprivation: Ontario, January 15, 2020 to June 3, 2020 (n=23,106 cases)



Q1 to Q5 represents the five quintiles of material deprivation with Q1 being the least deprived and Q5 being the most deprived.

The episode date is an estimate of a case's symptom onset date based on either the date of symptom onset, specimen collection/test date, or the date reported to public health.

Cases that reside in long-term care settings are not included in this analysis.

Interpret case counts for the most recent days (approximately 3 days) with caution due to reporting lags.

Data Source: integrated Public Health Information System (iPHIS) database, local case management systems (iPHIS plus), ON-Marg 2016.

Age and Sex Distribution

- No clear trend emerged for associations between gender and neighbourhood-level deprivation. Overall, males accounted for fewer cases than females with the proportion of cases accounted for by males ranging from 45.0% in quintile 1 to 47.2% in quintiles 3 and 4 ([Table 1](#)).
- There is a gradient in the proportion of cases aged 60 years and older across quintiles of neighbourhood-level deprivation ([Table 1](#)). Cases in the least deprived neighbourhoods (quintiles 1 and 2) tended to be older, with approximately 30% of cases age 60 years and older, compared to just under ¼ of cases in the most deprived neighbourhoods (quintiles 4 and 5).

Table 1. Age and sex of confirmed cases of COVID-19 for each quintile of material deprivation: Ontario, January 15, 2020 to June 3, 2020

Quintiles of material deprivation	Number of cases	Median age (years)	% of cases ≥ 60 years	% male cases
Quintile 1 (Least deprived)	3,937	49	30.0%	45.0%
Quintile 2	3,785	50	30.7%	45.4%
Quintile 3	4,472	49	25.7%	47.2%
Quintile 4	4,729	47	24.3%	47.2%
Quintile 5 (Most deprived)	6,183	46	23.2%	47.0%

Does not include 13 cases with missing/unknown age; denominators for calculating % male includes all cases of all sex (i.e., male, female, unknown and unspecified).

Minimum age for cases in all five quintiles was <1 year while the maximum age in all five quintiles ranged from 103-111 years.

Cases that reside in long-term care settings are not included in this analysis.

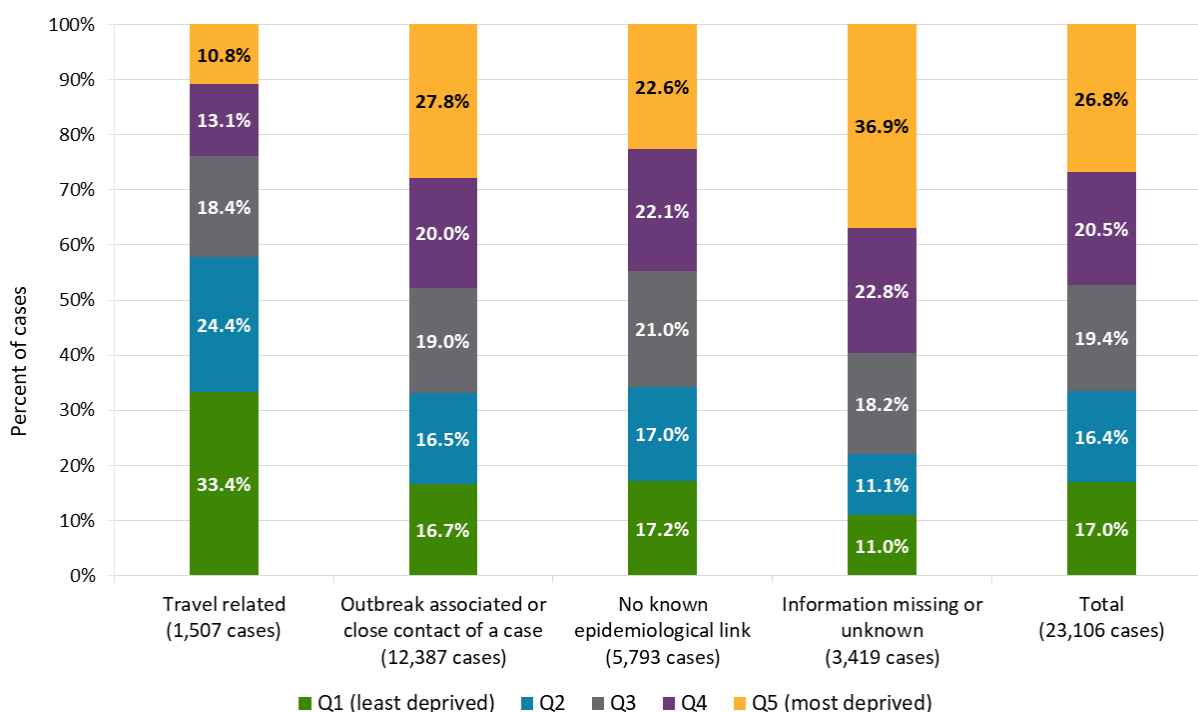
Data Source: integrated Public Health Information System (iPHIS) database, local case management systems (iPHIS plus), ON-Marg 2016.

Exposures

Exposures reported by COVID-19 cases are indicative of potential sources of infection. In the early stages of the pandemic, the majority of cases occurred among Ontarians returning from international travel and among their close contacts, whereas since April 2020 more cases have reported acquisition in Ontario.

- There were no clear trends between non-travel exposure types (i.e., outbreak related, close contact of a case or other exposures) and neighbourhood-level deprivation. In contrast, in the most deprived neighbourhoods (quintiles 4 and 5), travel-related exposures were 60% to 150% lower than expected, respectively, given their respective distribution of reported cases ([Figure 3](#)). Travel-related exposures among cases in the least deprived neighbourhoods (quintiles 1 and 2) were 1.5 to 2 times higher than their respective distribution of reported cases, suggesting that travel was a more common exposure among people in the least deprived neighbourhoods.
- Data on exposures were not available for 14.8% of COVID-19 cases. Residents of the most deprived neighbourhoods (quintile 5) accounted for the highest proportion of cases with missing/unknown exposure information (36.9%).

Figure 3. Exposures reported for confirmed cases of COVID-19 by quintiles of material deprivation: Ontario, January 15, 2020 to June 3, 2020



Q1 to Q5 represents the five quintiles of material deprivation with Q1 being the least deprived and Q5 being the most deprived.

Exposure status is determined hierarchically when multiple exposures have been reported as described in the technical notes for this report.

Travel-related refers to travel outside of Ontario within the 14 days prior to symptom onset.

Cases that reside in long-term care settings are not included in this analysis.

Data Source: integrated Public Health Information System (iPHIS) database, local case management systems (iPHIS plus), ON-Marg 2016.

Severe Outcomes

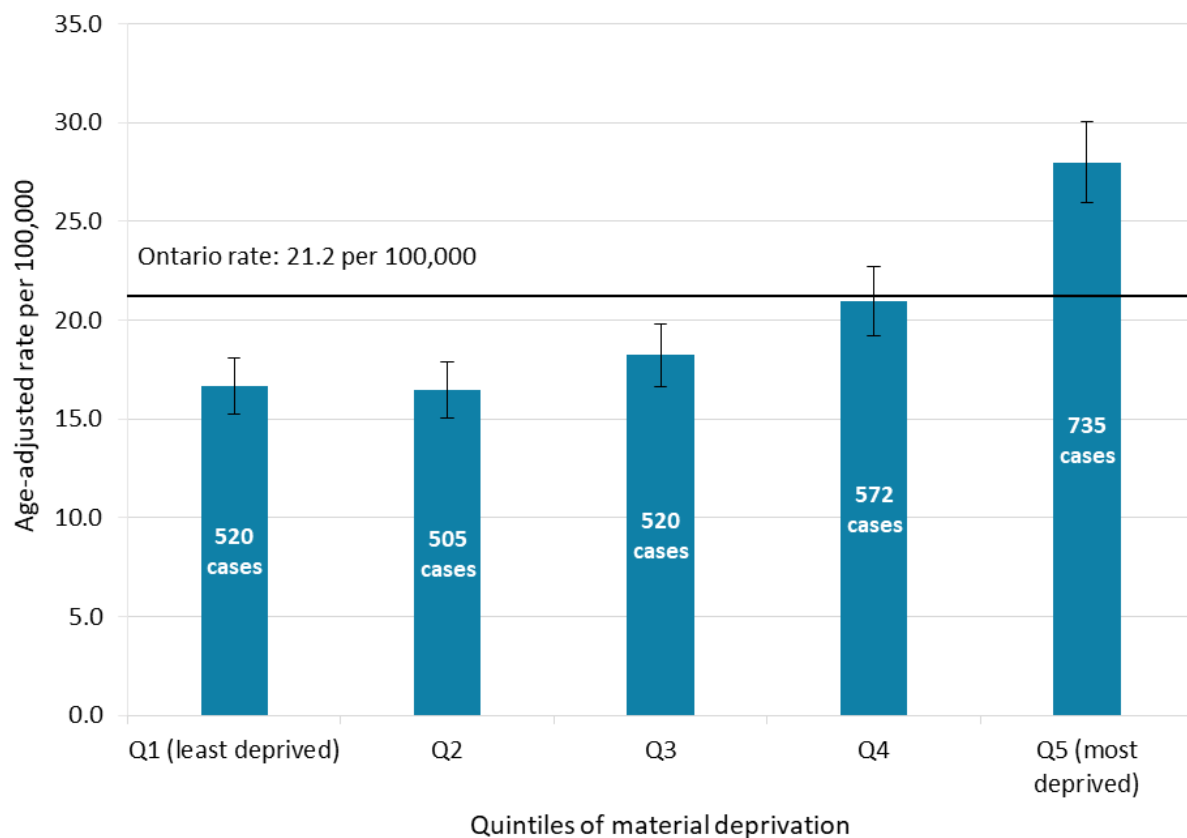
Accumulating evidence from around the world^{2,3} and emerging evidence nationally^{4,5} and specifically from Ontario^{6,7} and Quebec⁸ indicate that social and economic factors differentially influence the risk of contracting COVID-19 and developing severe outcomes following infection. These socio-economic factors are also inextricably linked to race and ethnicity, which is the subject of an earlier report on COVID-19 and neighbourhood-level marginalization⁹. This section of the report will focus on hospitalization and deaths among COVID-19 cases across the five quintiles of material deprivation. Due to delays in reporting, details about hospitalization and deaths are incomplete for the most recent cases and so observed trends should be interpreted with caution.

Hospitalizations

- The proportion of cases that was hospitalized in each of the five neighbourhood quintiles did not vary markedly, ranging from a low of 11.6% for neighbourhoods in quintile 3 to a high of 13.3% for neighbourhoods in quintile 2.

- In contrast, the age-adjusted hospitalization rates for COVID-19 showed a trend of increasing hospitalizations with increasing neighbourhood-level deprivation. Neighbourhoods of Ontario that were more deprived had the highest age-adjusted hospitalization rates for COVID-19 (Figure 4). The hospitalization rate for the most deprived neighbourhoods (28.0 admissions per 100,000 population in quintile 5) was approximately 70% higher than the corresponding rates for neighbourhoods with the least deprivation (quintiles 1 and 2). The lowest age-adjusted hospitalization rates were found in the least deprived neighbourhoods of the province with rates of 16.6 admissions per 100,000 population for quintile 1 and 16.5 admissions per 100,000 population for quintile 2. For Ontario, the age-adjusted COVID-19 hospitalization rate after excluding cases that reside in long-term care settings was 21.2 admissions per 100,000 population.

Figure 4. Age-adjusted rate and number of hospitalizations among confirmed cases of COVID-19 for each quintile of material deprivation: Ontario, January 15, 2020 to June 3, 2020



Includes all cases that were admitted to hospital or treated in an ICU; includes cases that were discharged or are currently hospitalized.

Rates per 100,000 population (bar heights) are adjusted for the size and age structure of the population. The upper and lower caps of the lines on each bar show the upper and lower limits (respectively) within which the corresponding rate would occur 95% of the times.

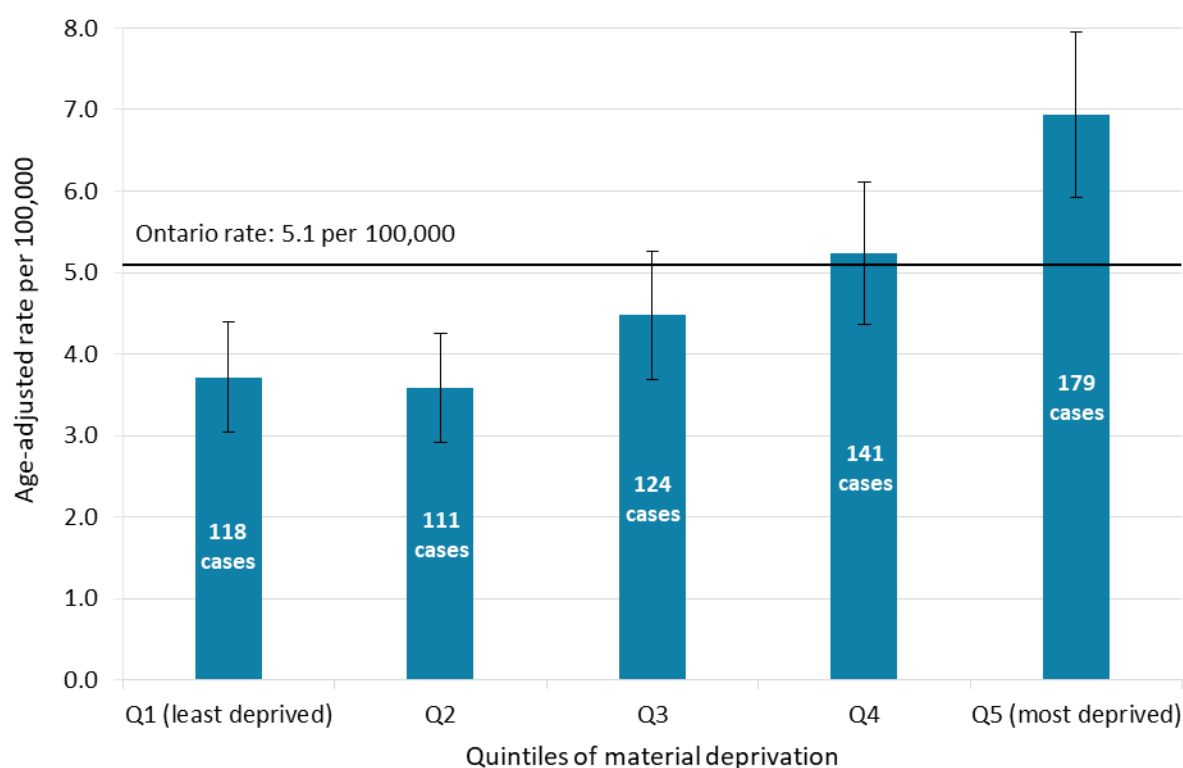
Horizontal line represents the age-adjusted rate for Ontario excluding cases that reside in long-term care settings. Cases that reside in long-term care settings are not included in this analysis.

Data Source: integrated Public Health Information System (iPHIS) database, local case management systems (iPHIS plus), ON-Marg 2016.

ICU Admissions

- At least one-fifth of all hospitalized cases in each of the five neighbourhood quintiles of deprivation were treated in an intensive care unit (ICU).
- After adjusting for age, the rates of ICU admission showed a gradient effect with a steady increase in rates as neighbourhood-level deprivation increased ([Figure 5](#)). Quintile 5 (most deprived) had the highest age-adjusted rate of COVID-19 ICU admissions at 6.9 admissions per 100,000 population compared to less deprived neighbourhoods of quintiles 1 and 2 with 3.7 and 3.6 admissions per 100,000 population, respectively. For the province as a whole, the age-adjusted ICU admission rate of COVID-19 after excluding cases that reside in long-term care settings was 5.1 admissions per 100,000 population.

Figure 5. Age-adjusted rate and number of ICU admissions among confirmed cases of COVID-19 for each quintile of material deprivation: Ontario, January 15, 2020 to June 3, 2020



Includes all cases that were treated or are currently being treated in an ICU.

Rates per 100,000 population (bar heights) are adjusted for the size and age structure of the population. The upper and lower caps of the lines on each bar show the upper and lower limits (respectively) within which the corresponding rate would occur 95% of the times.

Horizontal line represents the age-adjusted rate for Ontario excluding cases that reside in long-term care settings. Cases that reside in long-term care settings are not included in this analysis.

Data Source: integrated Public Health Information System (iPHIS) database, local case management systems (iPHIS plus), ON-Marg 2016.

Deaths

- COVID-19 deaths described in this report represent only 33.5% of the deaths reported during the period January 15 to June 3, 2020. As such, they are not representative of all deaths reported in Ontario as deaths that have occurred among cases that reside in LTC settings are not included.
- In general, the case fatality rate for COVID-19 decreased with increasing neighbourhood-level deprivation with rates ranging from 2.9% (Q4) to 3.9% (Q1). The exception to this trend was Q5, which had a case fatality rate of 3.4% (Table 2). However, the highest mortality rate after adjusting for age was in quintile 5 (most deprived) with 7.5 deaths per 100,000 population (Figure 6). The persistent trend of increasing deaths with increasing deprivation was not observed as mortality rates in the other quintiles were relatively comparable, ranging from 4.4 to 5.0 deaths per 100,000 population in quintiles 2 and 3, respectively. For Ontario as a whole, the age-adjusted mortality rate for COVID-19 after excluding cases that reside in long-term care settings was 5.6 deaths per 100,000 population.

Table 2. Case fatality, age-adjusted mortality rate and number of deaths among confirmed cases of COVID-19 for each quintile of material deprivation: Ontario, January 15, 2020 to June 3, 2020

Quintiles of material deprivation	Number of cases	Number of reported deaths	Case fatality rate	Age-adjusted mortality rate per 100,000 population
Q1 (Least deprived)	3,937	155	3.9%	4.9
Q2	3,785	138	3.6%	4.4
Q3	4,472	149	3.3%	5.0
Q4	4,729	137	2.9%	4.6
Q5 (Most deprived)	6,183	210	3.4%	7.5

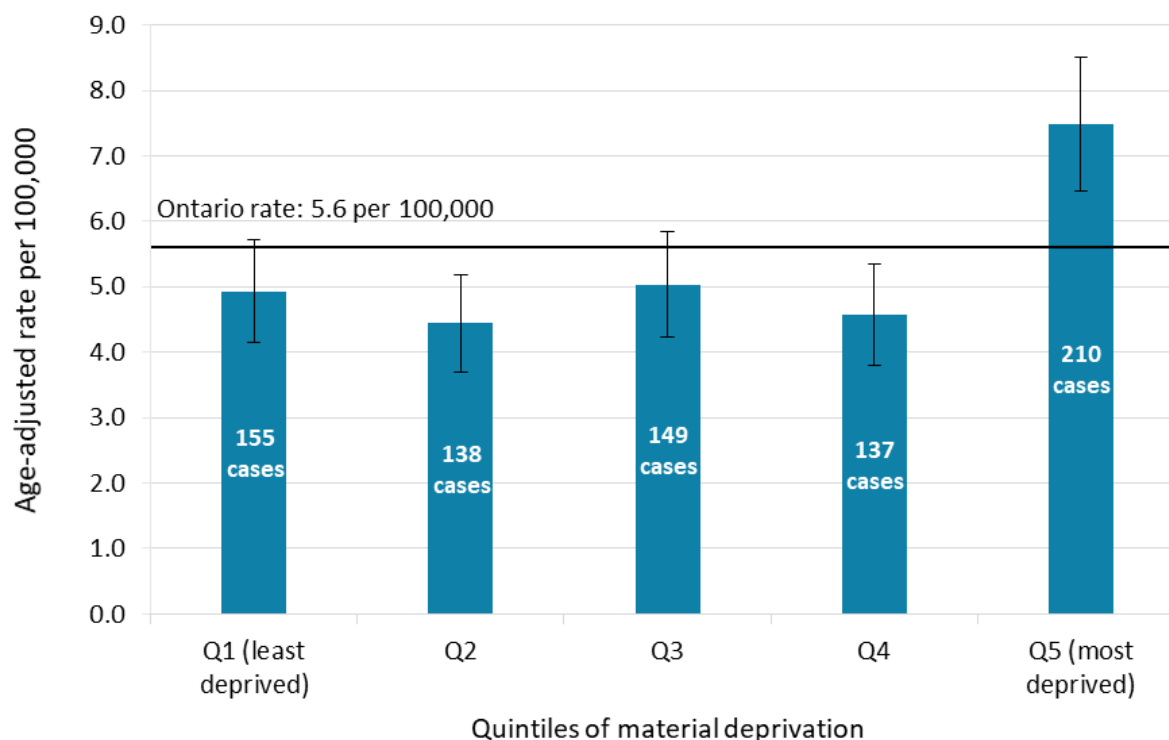
Includes all COVID-19 cases reported as 'Fatal'.

Rates per 100,000 population (bar heights) are adjusted for the size and age structure of the population.

Cases that reside in long-term care settings are not included in this analysis.

Data Source: integrated Public Health Information System (iPHIS) database, local case management systems (iPHIS plus), ON-Marg 2016.

Figure 6. Age-adjusted mortality rate and number of deaths among confirmed cases of COVID-19 for each quintile of material deprivation: Ontario, January 15, 2020 to June 3, 2020



Includes all COVID-19 cases reported as 'Fatal'.

Rates per 100,000 population (bar heights) are adjusted for the size and age structure of the population. The upper and lower caps of the lines on each bar show the upper and lower limits (respectively) within which the corresponding rate would occur 95% of the times.

Horizontal line represents the age-adjusted rate for Ontario excluding cases that reside in long-term care settings. Cases that reside in long-term care settings are not included in this analysis.

Data Source: integrated Public Health Information System (iPHIS) database, local case management systems (iPHIS plus), ON-Marg 2016.

Technical Notes

Data Sources

- The data for this report were based on:
 - Information extracted from the Ontario Ministry of Health (Ministry) integrated Public Health Information System (iPHIS) database as of **June 3, 2020 at 4 p.m.**
 - Information successfully uploaded to the Ministry from local case management systems: Toronto Public Health Coronavirus Rapid Entry System (CORES), The Ottawa Public Health COVID-19 Ottawa Database (The COD) and Middlesex-London COVID-19 Case and Contact Management Tool (CCMtool) as of **June 3, 2020 at 2 p.m.**
- iPHIS plus (which includes iPHIS, CORES, The COD and COVID-19 CCMtool) are dynamic disease reporting systems, which allows ongoing updates to data previously entered. As a result, data extracted from iPHIS and the local systems represent a snapshot at the time of extraction and may differ from previous or subsequent reports.
- Statistics Canada 2016 Canadian census dissemination area profiles.

Data Caveats and Methods - Case Data

- This report includes cases that met the Ontario Ministry of Health confirmed case definition for COVID-19 at the time of diagnosis that do not report living in a long-term care facility.
 - ‘Long-term care home residents’ includes cases that reported ‘Yes’ to the risk factor ‘Resident of nursing home or other chronic care facility’ and linked to an outbreak assigned as a long-term care home using details in the Outbreak number or case comments field; or were reported to be part of an outbreak assigned as a long-term care home (via the outbreak number or case comments field) with an age over 70 years and did not report ‘No’ to the risk factor ‘Resident of nursing home or other chronic care facility’. Excludes cases that reported ‘Yes’ to both risk factors: ‘Resident of nursing home or other chronic care facility’ and ‘health care worker’.
- The episode date is an estimate of a case’s symptom onset date. This date is calculated based on a hierarchy that first considers the date of first symptom onset, followed by the specimen collection/test date or the date reported to public health.
- Observed trends in incidence over time should be interpreted with caution for the most recent 3-day period due to reporting and/or data entry lags.
- The data only represent cases reported to public health and recorded in iPHIS plus. As a result, the number of reported cases as well as case details (e.g. comorbidities) are subject to underreporting owing to factors such as illness awareness, illness severity, medical care seeking behaviour, clinical practice, laboratory testing algorithms and reporting practices.
- Data on hospital admissions, ICU admissions and deaths are likely under-reported as these events may occur after the completion of public health follow up of cases. Cases that were admitted to hospital or died after follow-up was completed may not be captured in iPHIS.

- The hospitalization measure of illness severity includes all cases for which a hospital admission date was reported at the time of data extraction. It includes cases that were discharged from hospital as well as cases that are currently hospitalized. Emergency room visits are not included in the number of reported hospitalizations.
- ICU admission is a measure of illness severity that includes all cases for which an ICU admission date was reported at the time of data extraction. It is a subset of the count of hospitalized cases. It includes cases that were treated or that are currently being treated in an ICU.
- Death is a measure of illness severity that includes all cases for which an outcome of fatal was reported at the time of data extraction.
- Cases with unknown or missing ages were excluded from age-specific analyses.
- Likely source of acquisition for a case was determined by examining the exposure and risk factor fields from iPHIS and local systems to determine whether the case travelled, was associated with an outbreak, was a contact of another case, had no known epidemiological link (sporadic community transmission) or was reported to have an unknown source/no information was reported. Cases with multiple exposures or risk factors were assigned to a single likely acquisition source group which was determined hierarchically in the following order:
 - For cases with an episode date *on or after* April 1, 2020: Outbreak-associated > close contact of a confirmed case > travel > sporadic community transmission > information missing or unknown
 - For cases with an episode date *before* April 1, 2020: Travel > outbreak-associated > close contact of a confirmed case > sporadic community transmission > information missing or unknown

Data Caveats and Methods - ON-Marg

- The material deprivation dimension of the Ontario Marginalization Index (ON-Marg) was used as a proxy for socio-economic status for cases in this report since individual-level data are not available in iPHIS.
- ON-Marg is an area-based index which assigns a measure of socio-economic status based on neighbourhood characteristics, not individual characteristics. Not all individuals in a given area will reflect the broader demographic trends of the area they live in. This means that not every individual who lives in an area of high material deprivation experiences material deprivation themselves. Heterogeneity of demographic characteristics can vary substantially, especially across large rural geographies.
- The material deprivation dimension is based on the following socio-economic factors: (1) the proportion of the population aged 25 to 64 without a certificate, diploma or degree, (2) the proportion of families who are lone parent families, (3) the proportion of total income from government transfer payments for population aged 15+ years, (4) the proportion of the population aged 15+ years who are unemployed, (5) the proportion of the population considered low-income and (6) the proportion of households living in dwellings that are in need of major repair.

- Cases were assigned to quintiles of material deprivation based on postal code of residence. The Postal Code Conversion File Plus (PCCF+) version 7B was used to match postal codes to Statistics Canada dissemination area geographies, which were subsequently assigned to a quintile of material deprivation using the Ontario Marginalization Index (ON-Marg).
- People who reside in long-term settings are not represented in Canadian census data from which the material deprivation component of ON-Marg is calculated. Therefore cases that reported residency in long-term care settings were excluded from this report. Cases with invalid or missing postal codes were also excluded because postal code is required to assign cases to an area-level quintile of material deprivation.

Appendix A: Demographic Characteristics of the Population of the Material Deprivation Quintiles

Population characteristic	Quintile 1 (least deprived)	Quintile 2	Quintile 3	Quintile 4	Quintile 5 (most deprived)
Population	3,026,112	2,833,474	2,547,530	2,432,696	2,541,350
Proportion of the population	22.5%	21.1%	18.9%	18.1%	18.9%
Non-White, non-Indigenous	23.1%	26.5%	29.4%	32.0%	38.1%
Black	2.3%	2.9%	4.1%	5.1%	10.2%
East and Southeast Asian	9.7%	10.8%	9.4%	10.0%	10.1%
Latino	1.1%	1.1%	1.3%	1.7%	2.4%
Middle Eastern	2.8%	2.7%	2.5%	2.4%	3.5%
South Asian	5.9%	7.5%	10.5%	11.0%	9.6%
Recent immigrant (<5 years)	2.7%	2.9%	3.1%	4.0%	5.6%
Cannot speak English or French	1.4%	1.9%	2.3%	3.0%	4.0%
Seniors (age 65+)	15.9%	16.5%	17.4%	18.2%	16.1%
Low income	10.3%	14.1%	17.2%	20.5%	26.8%
Without high school diploma	16.8%	20.7%	25.4%	32.1%	44.3%
Lone-parent families	23.6%	15.6%	19.7%	29.6%	47.9%
Dwellings that are apartment buildings	7.6%	9.3%	11.7%	16.1%	29.5%
Average number of	2.8 persons	2.8 persons	2.8 persons	2.6 persons	2.5 persons

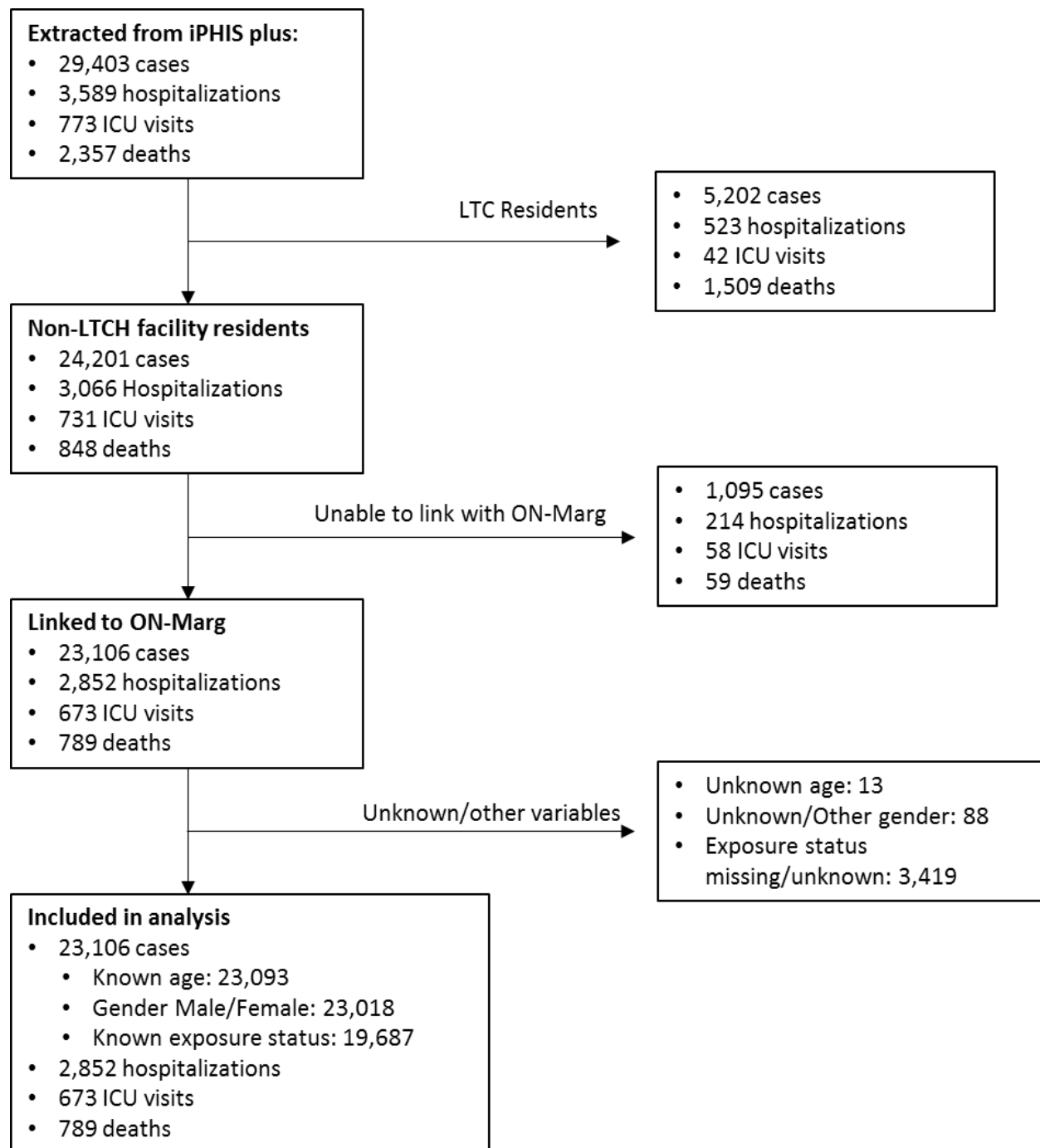
Population characteristic	Quintile 1 (least deprived)	Quintile 2	Quintile 3	Quintile 4	Quintile 5 (most deprived)
persons per dwelling					

The sum of the population of all quintiles is less than the total Ontario population because not all areas could be assigned to an ON-Marg quintile.

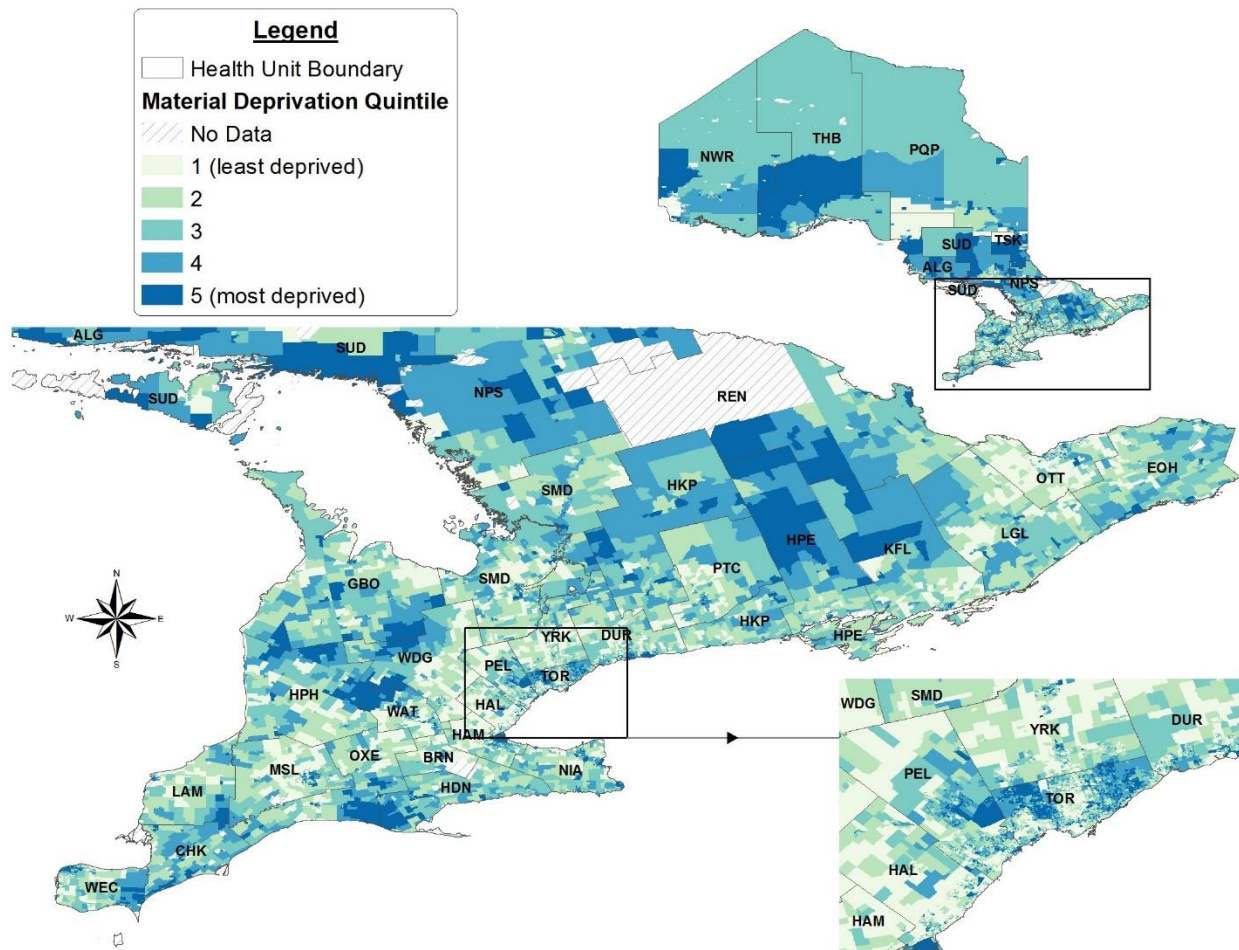
The non-White, non-Indigenous population includes the included ethno-racial groups along with persons that identify as being of mixed ethnicity/race and “other”.

Data Source: Statistics Canada. Census of Population, 2016: Profile for Canada, Provinces, Territories, Census Divisions, Census Subdivisions and Dissemination Areas. Retrieved from: https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/download-telecharger/comp/GetFile.cfm?Lang=E&FILETYPE=CSV&GEONO=044_ONTARIO

Appendix B: COVID-19 Cases Reported in Ontario up to June 3, 2020 and Included in this Report



Appendix C: Ontario Census Geographies and the Ontario Marginalization Index Material Deprivation Dimension



See [Appendix D](#) for the full names for health units shown on this map.

Data source:

Statistics Canada. Dissemination area boundary files, census year 2016. Catalogue no. 92-169-X2016001 [Internet]. Ottawa, ON: Statistics Canada; 2016 Nov 16 [extracted 2018 Nov 13]. Available from: <https://www150.statcan.gc.ca/n1/en/catalogue/92-169-X2016001>

Matheson FI, van Ingen T. 2016 Ontario marginalization index [Internet]. Toronto, ON: St. Michael's Hospital; 2018 [cited 2020 May 12]. Available from: <https://www.publichealthontario.ca/en/data-and-analysis/health-equity/ontario-marginalization-index>

Appendix D: Ontario Public Health Units

Code	Health Unit Name
ALG	The District of Algoma Health Unit
BRN	Brant County Health Unit
CHK	Chatham-Kent Health Unit
DUR	Durham Regional Health Unit
EOH	The Eastern Ontario Health Unit
GBO	Grey Bruce Health Unit
HAL	Halton Regional Health Unit
HAM	City of Hamilton Health Unit
HDN	Haldimand-Norfolk Health Unit
HKP	Haliburton, Kawartha, Pine Ridge District Health Unit
HPE	Hastings and Prince Edward Counties Health Unit
HPH	Huron Perth Health Unit
KFL	Kingston, Frontenac and Lennox And Addington Health Unit
LAM	Lambton Health Unit
LGL	Leeds, Grenville and Lanark District Health Unit
MSL	Middlesex-London Health Unit
NIA	Niagara Regional Area Health Unit
NPS	North Bay Parry Sound District Health Unit
NWR	Northwestern Health Unit
OTT	City of Ottawa Health Unit
OXE	Oxford Elgin St. Thomas Health Unit
PEL	Peel Regional Health Unit
PQP	Porcupine Health Unit

Code	Health Unit Name
PTC	Peterborough County-City Health Unit
REN	Renfrew County and District Health Unit
SMD	Simcoe Muskoka District Health Unit
SUD	Sudbury and District Health Unit
THB	Thunder Bay District Health Unit
TOR	City of Toronto Health Unit
TSK	Timiskaming Health Unit
WAT	Waterloo Health Unit
WDG	Wellington-Dufferin-Guelph Health Unit
WEC	Windsor-Essex County Health Unit
YRK	York Regional Health Unit

References

1. Matheson FI, van Ingen T. 2016 Ontario marginalization index [Internet]. Toronto, ON: St. Michael's Hospital; Ontario Agency for Health Protection and Promotion (Public Health Ontario); 2018 [cited 2020 May 12]. Available from: <https://www.publichealthontario.ca/en/data-and-analysis/health-equity/ontario-marginalization-index>
2. Chen JT, Krieger N. Revealing the unequal burden of COVID-19 by income, race/ethnicity, and household crowding: US county vs. ZIP code analyses. HCPDS Working Paper Series. 2020;19(1). Available from: https://cdn1.sph.harvard.edu/wp-content/uploads/sites/1266/2020/04/HCPDS_Volume-19_No_1_20_covid19_RevealingUnequalBurden_HCPDSWorkingPaper_04212020-1.pdf
3. United Kingdom Office for National Statistics. Deaths involving COVID-19 by local area and socioeconomic deprivation: deaths occurring between 1 March and 17 April 2020. Newport: Office for National Statistics; 2020 [cited 2020 May 12]. Available from: <https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/bulletins/deathsinvolvingcovid19bylocalareasanddeprivation/deathsoccurringbetween1marchand17april>
4. Deng Z, Messacar D, Morissette R; Statistics Canada. STATCAN COVID-19: Data to insights for a better Canada. Running the economy remotely: potential for working from home during and after COVID-19 [Internet]. Ottawa, ON: Her Majesty the Queen in Right of Canada as represented by the Minister of Industry; 2020 [cited 2020 Jun 10]. Available from: <https://www150.statcan.gc.ca/n1/pub/45-28-0001/2020001/article/00026-eng.htm>
5. Messacar D, Morissette R, Deng Z; Statistics Canada. STATCAN COVID-19: Data to insights for a better Canada. Inequality in the feasibility of working from home during and after COVID-19 [Internet]. Ottawa, ON: Her Majesty the Queen in Right of Canada as represented by the Minister of Industry; 2020 [cited 2020 Jun 10]. Available from: <https://www150.statcan.gc.ca/n1/en/pub/45-28-0001/2020001/article/00029-eng.pdf?st=d76ZPJG6>
6. Chung H, Fung K, Ferreira-Legere LE, Chen B, Ishiguro L, Kalappa G, et al. COVID-19 laboratory testing in Ontario: patterns of testing and characteristics of individuals tested, as of April 30, 2020. Toronto, ON: ICES; 2020. Available from: <https://www.ices.on.ca/Publications/Atlases-and-Reports/2020/COVID-19-Laboratory-Testing-in-Ontario>
7. Ontario Agency for Health Protection and Promotion (Public Health Ontario). COVID-19 – What we know so far about... social determinants of health [Internet]. Toronto, ON: Queen's Printer for Ontario; 2020 [cited 2020 Jun 9]. Available from: <https://www.publichealthontario.ca/-/media/documents/ncov/covid-wwksf/2020/05/what-we-know-social-determinants-health.pdf?la=en>
8. Shingler B, Stevenson V. COVID-19's devastating toll on families in Montreal's poorest neighbourhoods. CBC News (Montreal) [Internet], 2020 May 15 [cited 2020 Jun 6]. Available from: <https://www.cbc.ca/news/canada/montreal/montreal-low-income-inequality-covid-19-1.5570296>
9. Ontario Agency for Health Protection and Promotion (Public Health Ontario). COVID-19 in Ontario - a focus on diversity: January 15, 2020 to May 14, 2020 [Internet]. Toronto, ON: Queen's Printer for

Ontario; 2020 [cited 2020 Jun 6]. Available from: <https://www.publichealthontario.ca/-/media/documents/ncov/epi/2020/06/covid-19-epi-diversity.pdf?la=en>

Disclaimer

This document was developed by Public Health Ontario (PHO). PHO provides scientific and technical advice to Ontario's government, public health organizations and health care providers. PHO's work is guided by the current best available evidence at the time of publication.

The application and use of this document is the responsibility of the user. PHO assumes no liability resulting from any such application or use.

This document may be reproduced without permission for non-commercial purposes only and provided that appropriate credit is given to PHO. No changes and/or modifications may be made to this document without express written permission from PHO.

Citation

Ontario Agency for Health Protection and Promotion (Public Health Ontario). COVID-19 in Ontario - a focus on material deprivation: January 15, 2020 to June 3, 2020 Toronto, ON: Queen's Printer for Ontario; 2020.

For Further Information

For more information, email cd@oahpp.ca.

Public Health Ontario

Public Health Ontario is an agency of the Government of Ontario dedicated to protecting and promoting the health of all Ontarians and reducing inequities in health. Public Health Ontario links public health practitioners, front-line health workers and researchers to the best scientific intelligence and knowledge from around the world.

For more information about PHO, visit publichealthontario.ca.

