

Enhanced Epidemiological Summary

COVID-19 Infection in Children: January 15, 2020 to May 12, 2020

This report includes information available from the integrated Public Health Information System (iPHIS) as of **4 p.m. on May 12, 2020** and from the Toronto Public Health Coronavirus Rapid Entry System (CORES) and Ottawa Public Health COVID-19 Ottawa Database (The COD) as of **2 p.m. May 12, 2020**.

Purpose

This report provides a focused analysis of laboratory-confirmed COVID-19 cases in children reported in Ontario, as per the Ministry of Health's [case definition](#). For the purpose of this report, children are defined as cases 19 years of age and under (i.e. up to the day before their 20th birthday). It includes information on severity of illness, acquisition exposures and symptoms. All data in this report are preliminary and may change as more case reports and case details are received.

Additional details on the status of COVID-19 cases in Ontario by geography, demographic features and outcomes are provided in the [Daily Epidemiologic Summary](#) which is available on the Ministry of Health's website, as well as the [Ontario COVID-19 Data Tool](#) which is available on Public Health Ontario's website.

Background

The report describes only laboratory-confirmed cases among children in Ontario. Detection and reporting of cases is strongly influenced by the laboratory testing strategy (i.e. who is tested). The testing strategy in Ontario has changed over time as exposure risks, symptoms associated with COVID-19, laboratory testing capacity, and priority populations have evolved over the course of the pandemic. Since children may be more likely to have [milder or asymptomatic infection](#) and not present for care/testing, or otherwise be ineligible for testing if they are not part of a [priority population for testing](#), it is likely that COVID-19 infections in children in Ontario are under-detected and under-reported. Finally, schools and day-cares (except child care centres for healthcare and other essential workers) have been closed since mid-March 2020, as one of many broad public health measures put in place to reduce COVID-19 transmission.

Highlights

- Children account for a small number of COVID-19 cases (2.7% of the 21,236 confirmed cases) reported in Ontario, yet account for 21.1% of the Ontario population.
- The rate of infection among children is dramatically lower (18.2 per 100,000) than adults (176.1 per 100,000). Among children rates were highest (35.9 per 100,000) for 15 to 19 years olds.

- The most frequently reported acquisition exposure type among cases in children was close contact with a confirmed case (260 cases, 45.5%), while the most frequently reported exposure type among cases in adults was a link to an outbreak setting (8,985 cases, 43.5%).
- The proportion of severe outcomes, including hospitalizations, ICU admission, deaths and complications are much lower among cases in children compared to adults. No deaths were reported among cases in children.
 - Kawasaki-like syndrome and COVID-toes have not been reported among cases in children through the provincial reportable disease system to date. The provincial reportable disease system is dynamic and health units may update the system as further information becomes available.
- The proportion of asymptomatic cases was higher among children (7.2%) compared to adults 20 to 64 years of age (4.5%), but lower compared to adults 65 years of age and older (9.5%).

Overview

Since January 15, 2020, 2.7% (571 cases) of the total of 21,236 confirmed COVID-19 cases in Ontario were reported in children (Table 1) yet children account for 21.1% of the Ontario population. The rate of infection among children is dramatically lower (18.2 per 100,000) than adults (176.1 per 100,000). Among cases in children, rates of illness were highest among those 15-19 year of age (35.9 per 100,000). Overall males accounted for almost half of the cases in children (285 cases, 49.9%). However, within each age group, males accounted for half or more of the cases, with the exception of the 15-19 year of age group (45.7%).

Table 1. Confirmed cases of COVID-19 (N=21,236): Ontario, January 15, 2020 to May 12, 2020

Age group	Number of cases	Rate per 100,000 population	Number of male cases	% of male cases within each age group
<1 year	26	17.0	15	57.7
1-4 years	52	8.6	27	51.9
5-9 years	79	10.4	40	50.6
10-14 years	114	14.6	66	57.9
15-19 years	300	35.9	137	45.7
<20 years	571	18.2	285	49.9
≥20 years	20,651	176.1	8,633	41.8
Total	21,236	142.9	8,923	42

Notes:

¹ Cases with unknown age are excluded.

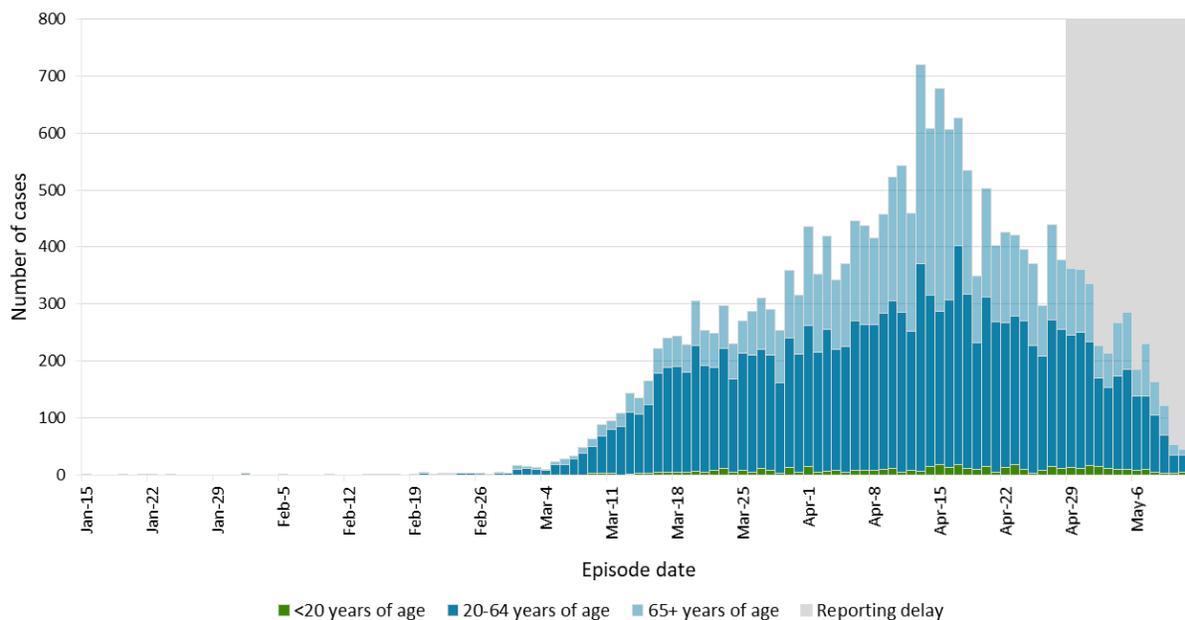
Data Source: integrated Public Health Information System (iPHIS) database, Coronavirus Rapid Entry System (CORES) database, The COVID-19 Ottawa Database (The COD).

Temporal Trends

Figure 1 shows the number of confirmed COVID-19 cases reported in Ontario. Cases are shown by episode date (an estimate of illness onset) and classified by age group. Daily case counts for children have remained relatively stable over time, compared to an increasing number of cases in adults, and in

particular adults 65 years of age and older. Due to delays in reporting case counts, data are likely incomplete for the most recent dates and should be interpreted with caution.

Figure 1. Confirmed cases of COVID-19 by age group and episode date: Ontario, January 15, 2020 to May 12, 2020 (N=21,236)



Notes:

- ¹ Cases with unknown age and missing episode dates are excluded.
- ² Interpret case counts for the most recent days with caution due to reporting lags. The light grey shading indicates the most recent period during which case counts are likely to be updated.
- ³ This date, referred to as episode date, is intended to approximate symptom onset date. It is calculated based on either the date of symptom onset, specimen collection/test date, or the date reported to public health.

Data Source: integrated Public Health Information System (iPHIS) database, Coronavirus Rapid Entry System (CORES) database, The COVID-19 Ottawa Database (The COD).

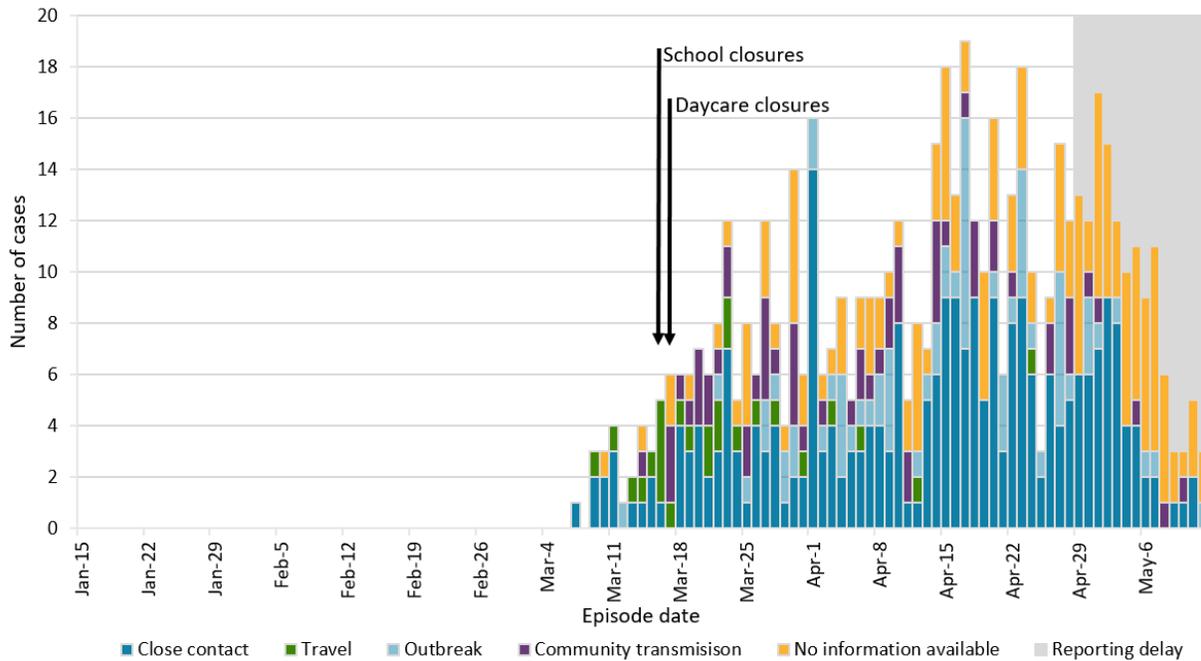
Acquisition Exposures

Figure 2 shows the number of confirmed COVID-19 cases reported among children in Ontario by episode date (an estimate of illness onset) and classified by acquisition exposure type. A single exposure is shown for each case. The dates corresponding to school and daycare closures are also shown. The number of cases in children reporting close contact with a confirmed case of COVID-19 has increased over time, while there were no cases reporting travel outside of Ontario after approximately mid-April. The federal [Minimizing the Risk of Exposure to COVID-19 in Canada Order \(Mandatory Isolation\)](#) for international travelers was issued on March 24, 2020.

Figure 3a and 3b compare the overall frequency of types of exposures reported among children to adults 20–64 years of age and 65 years of age and older. The most frequently reported exposure type among cases in children was close contact (260 cases, 45.5%) with a confirmed case of COVID-19, while the most frequently reported exposure type among cases in adults was a link to an outbreak setting. This trend was most evident among adults 65 years of age and older with 71.3% (5,385 cases) of cases reporting a link to an outbreak setting.

These findings may be in part a reflection of testing strategies, where adults living in long term care and other congregate setting are prioritized for testing, and household close contacts (including children) could be prioritized for testing. Travel outside of Ontario was the least frequently reported exposure among both children (26 cases, 4.6%) and adults 20 years of age and older (1,438 cases, 7.0%). Exposure information was missing or was reported as unknown for 26.8% of children and 21.7% of adults 20 years of age and older.

Figure 2. Confirmed cases of COVID-19 in children by ranked exposure type and episode date: Ontario, January 15, 2020 to May 12, 2020 (n=571)



Notes:

- ¹ Cases with unknown age and missing episode date are excluded.
- ² Interpret case counts for the most recent days with caution due to reporting lags. The light grey shading indicates the most recent period during which case counts are likely to be updated.
- ³ This date, referred to as episode date, is intended to approximate symptom onset date. It is calculated based on either the date of symptom onset, specimen collection/test date, or the date reported to public health.
- ⁴ One exposure type per case is shown. Case exposures were ranked using the following hierarchy: travel > outbreak > close contact > community transmission.
- ⁵ The arrow for school closures indicates the start of March Break, the first day of effective school closures.

Data Source: integrated Public Health Information System (iPHIS) database, Coronavirus Rapid Entry System (CORES) database, The COVID-19 Ottawa Database (The COD).

Figure 3a. Proportion of confirmed cases of COVID-19 in children and adults 20 to 64 years of age by ranked exposure type: Ontario, January 15, 2020 to May 12, 2020

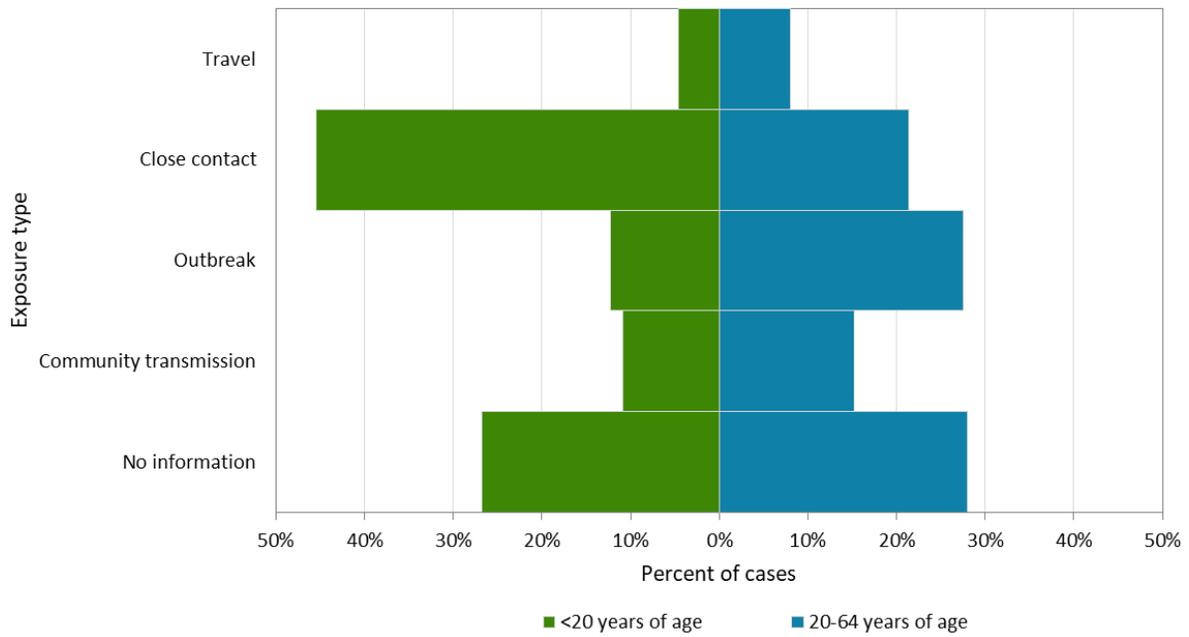
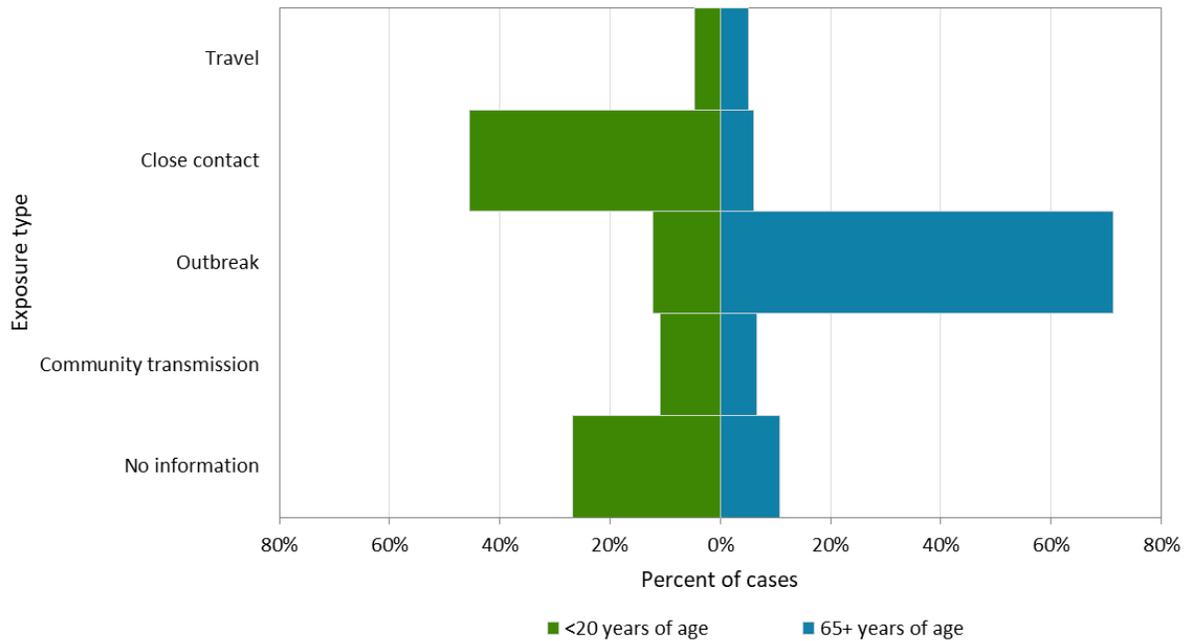


Figure 3b. Proportion of confirmed cases of COVID-19 in children and adults 65 years of age and older by ranked exposure type: Ontario, January 15, 2020 to May 12, 2020



Notes:

¹ Cases with unknown age are excluded.

² One exposure type per case is shown. Case exposures were ranked using the following hierarchy: travel > outbreak > close contact > community transmission.

Data Source: integrated Public Health Information System (iPHIS) database, Coronavirus Rapid Entry System (CORES) database, The COVID-19 Ottawa Database (The COD).

Severity of Illness

Table 2 shows confirmed COVID-19 cases among children and adults by severity of illness indicators. The proportion of hospital and intensive care unit (ICU) admissions is substantially lower among children (2.8% and 0.2%, respectively) compared to adults 20 years of age and older (13.0% and 3.0%, respectively). No deaths were reported among children, compared to 1,765 deaths reported among adults.

Complications, such as pneumonia, acute respiratory distress syndrome, and respiratory failure, related to COVID-19 infection were less frequently reported among children (7/571 cases, 1.2%) compared to adults 20 year of age and older (1,536/20,651 cases, 7.4%). Of the cases in children reporting a complication, one was under 1 year of age, one was 5-9 years of age and five were 15-19 years of age. Further, Kawasaki-like syndrome and COVID-toes have not been reported among cases in children through the provincial reportable disease system to date. The provincial reportable disease system is dynamic and health units may update the system as further information becomes available.

Table 2. Age distribution of confirmed cases of COVID-19 by severity of illness indicators: Ontario, January 15, 2020 to May 12, 2020

Age group	Number of cases	Number of hospital admissions	Age-specific hospital admissions (%)	Number of ICU admissions	Age-specific ICU admissions (%)	Number of deaths	Age-specific deaths (%)
<1 year	26	2	7.7	1	3.8	0	0
1-4 years	52	0	0	0	0	0	0
5-9 years	79	2	2.5	0	0	0	0
10-14 years	114	1	0.9	0	0	0	0
15-19 years	300	11	3.7	0	0	0	0
<20 years	571	16	2.8	1	0.2	0	0
≥20 years	20,651	2,677	13.0	610	3.0	1,765	8.5
Total	21,236	2,694	12.7	611	2.9	1,765	8.3

Notes:

¹ Cases with unknown age are excluded from age-specific categories.

Data Source: integrated Public Health Information System (iPHIS) database, Coronavirus Rapid Entry System (CORES) database, The COVID-19 Ottawa Database (The COD).

Symptoms

Table 3 and Figures 4a and 4b show laboratory-confirmed COVID-19 cases among children and adults by reported symptoms. The proportion of asymptomatic cases was higher among children (7.2%) compared to adults 20 to 64 years of age (4.5%), but lower than adults 65 years of age and older (9.5%). Of note, outbreak related testing for long-term care, hospitals and other congregate living settings includes testing of asymptomatic individuals, which likely explains the higher proportion of adults 65 years of age and older reported to be asymptomatic at the time of testing.

The proportion of cases reporting at least one symptom was higher among children (62.0%) compared to adults (60.8% and 41.8%, respectively for ages 20 to 64 years and 65 years and older). The symptom profile differed most for children and adults 65 years of age and older. In particular, 23.6% of children reported headache compared to 4.8% of adults 65 years and older and 28.5% of children reported upper respiratory symptoms (such as rhinorrhea and sore throat) compared to 7.5% of adults 65 years and older. Symptom information was not reported for 217 (30.8%) cases in children and 8,220 (39.8%) cases in adults.

Table 3. Self or proxy-reported symptoms among confirmed cases of COVID-19 by age group: Ontario, January 15, 2020 to May 12, 2020

	<20 years of age (n=571)	% of cases <20 years (n=571)	20-64 years (n=13,096)	% of cases 20-64 years (n=13,096)	65+ years (n=7,555)	% of cases 65+ years (n=7,555)
Asymptomatic	41	7.2	584	4.5	721	9.5
At least one symptom	354	62.0	7966	60.8	3160	41.8
Fever, chills, and/or sweats	178	31.2	4368	33.4	1938	25.7
Cough	173	30.3	5079	38.8	1712	22.7
Respiratory	50	8.8	1766	13.5	654	8.7
Upper respiratory	163	28.5	3082	23.5	568	7.5
Gastrointestinal	60	10.5	1691	12.9	570	7.5
Headache	135	23.6	3525	26.9	366	4.8
Neurologic	13	2.3	375	2.9	139	1.8
Loss of taste and/or smell	38	6.7	1015	7.8	87	1.2
Cardiac	15	2.6	520	4	66	0.9
Pain and/or fatigue	110	19.3	3356	25.6	957	12.7
Other	83	14.5	1798	13.7	474	6.3

Notes:

¹ Cases with unknown age are excluded.

² Cases may report multiple symptoms.

³ Respiratory includes shortness of breath, chest pain; upper respiratory includes rhinorrhea, sore throat; gastrointestinal includes diarrhea, vomiting; neurologic includes altered mental status, dizziness; pain and/or fatigue includes malaise, myalgia; other includes urinary, lymph node swelling, conjunctivitis, rash.

⁴Symptoms are self or proxy-reported, and are not reported by a health care professional.

Data Source: integrated Public Health Information System (iPHIS) database, Coronavirus Rapid Entry System (CORES) database, The COVID-19 Ottawa Database (The COD).

Figure 4a. Proportion of confirmed cases of COVID-19 in children and adults 20 to 64 years of age by self or proxy-reported symptoms: Ontario, January 15, 2020 to May 12, 2020

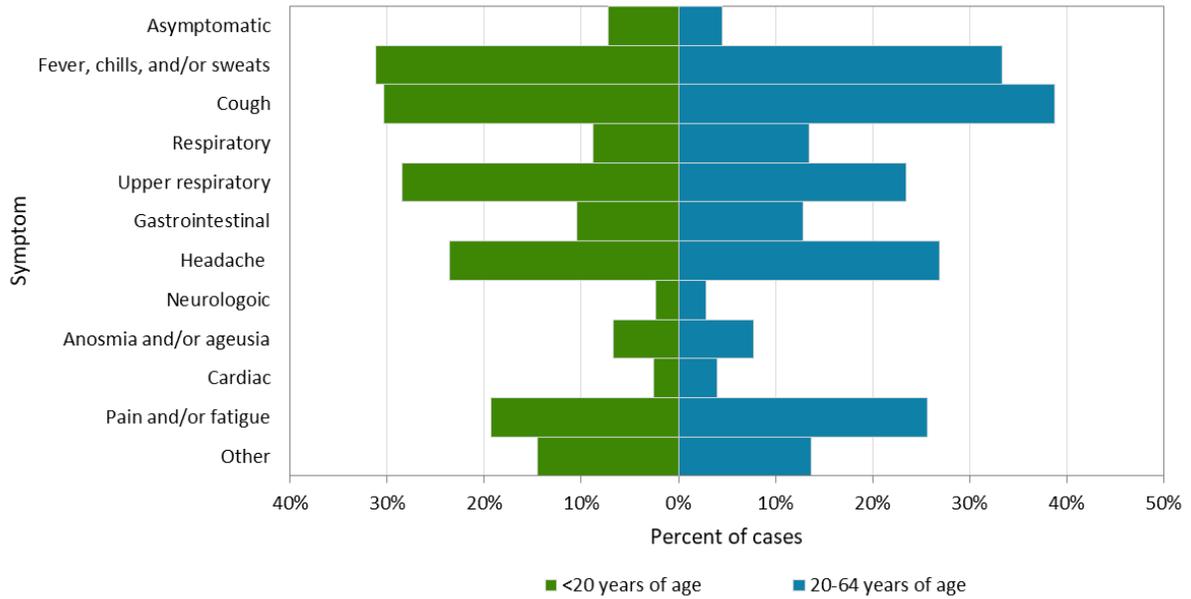
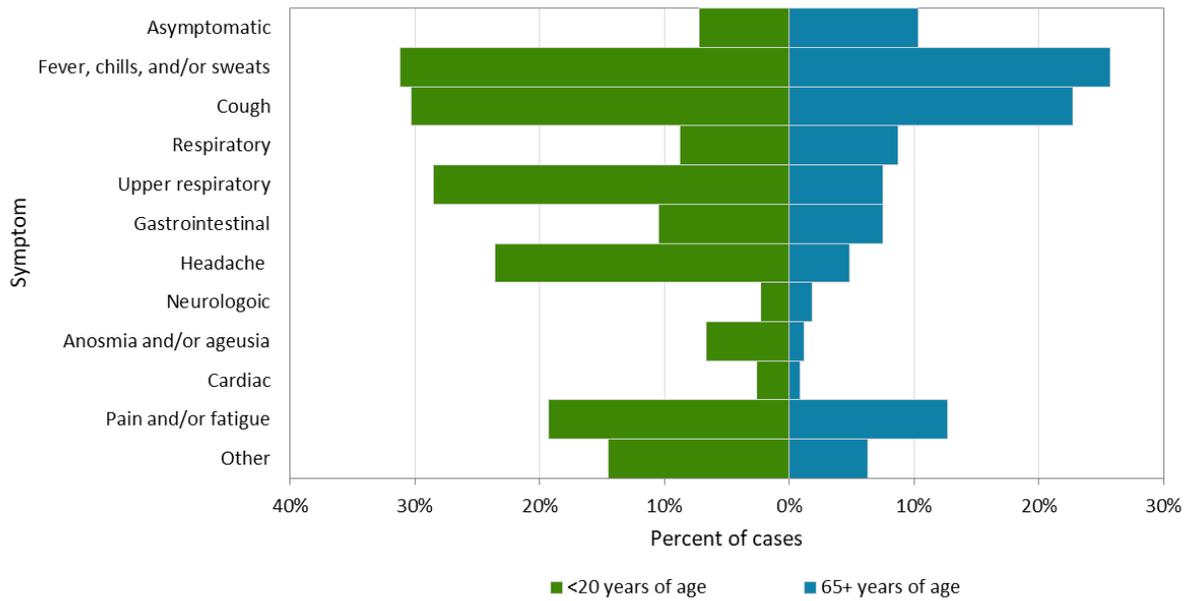


Figure 4b. Proportion of confirmed cases of COVID-19 in children and adults 65 years of age and older by self or proxy-reported symptoms: Ontario, January 15, 2020 to May 12, 2020



Notes:

¹ Cases with unknown age are excluded.

² Cases may report multiple symptoms.

³ Respiratory includes shortness of breath, chest pain; upper respiratory includes rhinorrhea, sore throat; gastrointestinal includes diarrhea, vomiting; neurologic includes altered mental status, dizziness; pain and/or fatigue includes malaise, myalgia; other includes urinary, lymph node swelling, conjunctivitis, rash.

⁴ Symptoms are self or proxy-reported, and are not reported by a health care professional.

Data Source: integrated Public Health Information System (iPHIS) database, Coronavirus Rapid Entry System (CORES) database, The COVID-19 Ottawa Database (The COD).

Technical Notes

Data Sources

- The data for this report were based on:
 - Information extracted from the Ontario Ministry of Health (MOH) integrated Public Health Information System (iPHIS) database, as of **May 12, 2020 at 4 p.m.**
 - Information successfully uploaded to the Ministry from Local Systems: the Toronto Public Health (Coronavirus Rapid Entry System) CORES and The Ottawa Public Health COVID-19 Ottawa Database (The COD), as of **May 12, 2020 at 2 p.m.**
- iPHIS, CORES and The COD 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.
- Ontario population projection data for 2020 were sourced from Ontario Ministry of Health, IntelliHEALTH Ontario. Data were extracted on November 26, 2019.

iPHIS Data Caveats:

- The data only represent cases reported to public health and recorded in iPHIS and the Local Systems (e.g., CORES, The COD). As a result, all counts will be subject to varying degrees of underreporting due to a variety of factors, such as disease awareness and medical care seeking behaviours, which may depend on severity of illness, clinical practice, changes in laboratory testing, and reporting behaviours.
- Lags in iPHIS and Local Systems data entry due to reduced holiday and weekend staffing may result in lower case counts recorded over holidays and weekends than would otherwise be recorded.
- Only cases meeting the confirmed case classification as listed in the MOH [COVID-19 case definition](#) are included in the report counts from iPHIS the Local Systems.
- Case episode date is based on an estimate of the best date of disease onset. This date is calculated based on either the date of symptom onset, specimen collection/test date, or the date reported to public health.
- Cases with missing episode dates were excluded from date-specific analysis.
- Cases with unknown ages were excluded from age-specific analyses.
- Exposure type is determined by examining the exposure and risk factor fields to determine whether a case travelled, was a contact of a case or neither. Outbreak-associated cases were classified using the outbreak number linked to the case. The following hierarchy was applied: Travel-related > Outbreak-associated > Close contact of a confirmed case > Community transmission > Information pending.

- Deaths are determined by using the outcome field in iPHIS or Local Systems. Any case marked 'Fatal' is included in the deaths data. Deaths are included whether or not COVID-19 was determined to be a contributing or underlying cause of death as indicated in the iPHIS field Type of Death.
 - The date of death is determined using the outcome date field for cases marked as 'Fatal' in the outcome field.
- Symptoms are self or proxy-reported, and not reported by a health care professional. Cases may report multiple symptoms. Only cases reporting 'yes' to symptoms were included in the analysis. Cases for which symptom information was not reported include cases reporting 'no', 'unknown', 'not asked' as well as cases with missing information.
- Asymptomatic was defined as any case reporting 'yes' to asymptomatic infection and 'no', 'unknown', 'not asked' to all other symptoms or where information was missing for those symptoms.
- Symptom information collected is more complete in iPHIS compared to Local Systems, such as CORES and The COD (i.e. more symptom options are available in iPHIS).
- iPHIS cases for which the Disposition Status was reported as ENTERED IN ERROR, DOES NOT MEET DEFINITION, DUPLICATE-DO NOT USE, or any variation on these values have been excluded.

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For Further Information

For more information, email cd@oahpp.ca.

Public Health Ontario

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