Enhanced Epidemiological Summary

COVID-19 Infection in Children: January 15, 2020 to July 13, 2020

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 July 13, 2020.

Please visit the interactive Ontario COVID-19 Data Tool to explore recent COVID-19 data by public health unit, age group, sex, and trends over time.

A Daily Epidemiological Summary, a Weekly Epidemiological Summary, as well as additional Enhanced Epidemiological Reports are available on the Public Health Ontario website.

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.

Background

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. Children may be more likely to have milder or asymptomatic infection and may therefore not present for care/testing.

Highlights

- Children account for a small number of COVID-19 cases (5.1% of the 36,950 confirmed cases) reported in Ontario, yet account for 21.1% of the Ontario population.

- The rate of infection among children is dramatically lower (60.4 per 100,000) than adults (298.8 per 100,000). Among children rates were highest (109.6 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 (1,353 cases, 71.4%).

- The proportion of severe outcomes, including hospitalizations, ICU admission, deaths and complications are much lower among cases in children compared to adults. One death has been reported in a child compared to 2,722 deaths reported among adults.
Multi-system inflammatory vasculitis was reported as a complication for one case 10 years of age.

- The proportion of asymptomatic cases was higher among children (23.9%) compared to adults 20 to 64 years of age (14.6%), and 65 years of age and older (19.8%).

**Overview**

Since January 15, 2020, 5.1% (1,895 cases) of the total of 36,950 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 (60.4 per 100,000) than adults (298.8 per 100,000). Among cases in children, rates of illness were highest among those 15-19 year of age (109.6 per 100,000).

**Table 1. Confirmed cases of COVID-19: Ontario, January 15, 2020 to July 13, 2020**

<table>
<thead>
<tr>
<th>Age group</th>
<th>Number of cases</th>
<th>Rate per 100,000 population</th>
<th>Number of male cases</th>
<th>% of male cases within each age group</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1 year</td>
<td>70</td>
<td>45.7</td>
<td>35</td>
<td>50.0</td>
</tr>
<tr>
<td>1-4 years</td>
<td>218</td>
<td>36.0</td>
<td>112</td>
<td>51.4</td>
</tr>
<tr>
<td>5-9 years</td>
<td>305</td>
<td>40.2</td>
<td>146</td>
<td>47.9</td>
</tr>
<tr>
<td>10-14 years</td>
<td>386</td>
<td>49.3</td>
<td>198</td>
<td>51.3</td>
</tr>
<tr>
<td>15-19 years</td>
<td>916</td>
<td>109.6</td>
<td>473</td>
<td>51.6</td>
</tr>
<tr>
<td>&lt;20 years</td>
<td>1,895</td>
<td>60.4</td>
<td>964</td>
<td>50.9</td>
</tr>
<tr>
<td>≥20 years</td>
<td>35,045</td>
<td>298.8</td>
<td>16,096</td>
<td>45.9</td>
</tr>
<tr>
<td>Total</td>
<td>36,950</td>
<td>248.58</td>
<td>17,064</td>
<td>46.2</td>
</tr>
</tbody>
</table>

Data Source: iPHIS plus

**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 cases in children have remained relatively low over time, compared to much higher numbers in adult.
Figure 1. Confirmed cases and rates of COVID-19 by age group and episode date: Ontario, January 15, 2020 to July 13, 2020

Note:
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.

Data Source: iPHIS plus

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 and daycare re-openings are also shown. The number of cases in children reporting close contact with a confirmed case of COVID-19 peaked in approximately late March and since have fluctuated, but decreased over all.

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 and adults 20-64 years of age was close contact with a confirmed case of COVID-19. However the proportion of cases reporting close contact with a case was much higher among children (1,353 cases, 71.4%) compared to adults 20-64 years of age (8,871 cases, 35.9%). The most frequently reported exposure type among cases in adults 65 years of age and older was a link to an outbreak setting (7,089 cases, 68.6%).
**Figure 2.** Confirmed cases of COVID-19 in children by ranked exposure type and episode date: Ontario, January 15, 2020 to July 13, 2020

**Notes:**
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.
The arrow for school closures indicates the start of March Break, the first day of effective school closures.
**Data Source:** iPHIS plus
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 July 13, 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 July 13, 2020

Data Source: iPHIS plus
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 (1.5% and 0.2%, respectively) compared to adults 20 years of age and older (12.2% and 2.6%, respectively). One death has been reported in a child, compared to 2,722 deaths reported among adults. The death occurred in a child under 10 years of age.

Complications, such as pneumonia, acute respiratory distress syndrome, and respiratory failure, related to COVID-19 infection were less frequently reported among children (21/1,895 cases, 1.1%) compared to adults 20 year of age and older (3,212/35,045 cases, 9.2%). Multi-system inflammatory vasculitis was reported as a complication for one case 10 years of age.

Table 2. Age distribution of confirmed cases of COVID-19 by severity of illness indicators: Ontario, January 15, 2020 to July 13, 2020

<table>
<thead>
<tr>
<th>Age group</th>
<th>Number of cases</th>
<th>Number of hospital admissions</th>
<th>Age-specific hospital admissions (%)</th>
<th>Number of ICU admissions</th>
<th>Age-specific ICU admissions (%)</th>
<th>Number of deaths*</th>
<th>Age-specific deaths (%)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1 year</td>
<td>70</td>
<td>5</td>
<td>7.1</td>
<td>1</td>
<td>1.4</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1-4 years</td>
<td>218</td>
<td>5</td>
<td>2.3</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>5-9 years</td>
<td>305</td>
<td>1</td>
<td>0.3</td>
<td>0</td>
<td>0</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>10-14 years</td>
<td>386</td>
<td>4</td>
<td>1.0</td>
<td>1</td>
<td>0.3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>15-19 years</td>
<td>916</td>
<td>14</td>
<td>1.5</td>
<td>1</td>
<td>0.1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>&lt;20 years</td>
<td>1,895</td>
<td>29</td>
<td>1.5</td>
<td>3</td>
<td>0.2</td>
<td>1</td>
<td>0.1</td>
</tr>
<tr>
<td>≥20 years</td>
<td>35,045</td>
<td>4,495</td>
<td>12.8</td>
<td>968</td>
<td>2.8</td>
<td>2,722</td>
<td>7.8</td>
</tr>
<tr>
<td>Total</td>
<td>36,950</td>
<td>4,525</td>
<td>12.2</td>
<td>971</td>
<td>2.6</td>
<td>2,723</td>
<td>7.4</td>
</tr>
</tbody>
</table>

Data Source: iPHIS plus

* Due to a single death in a child under 10 years of age, counts are not shown.

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 (23.9%) compared to adults 20 to 64 years of age (14.6%) and adults 65 years of age and older (19.8%).

The proportion of cases reporting at least one symptom was higher among children (70.3%) compared to adults aged 65 years and older (62.7%) but lower than for adults aged 20 to 64 years (78.0%). The largest differences in the symptom profile were observed between children and adults 65 years of age.
and older. In particular, 24.9% of children reported headache compared to 6.8% of adults 65 years and older and 29.7% of children reported upper respiratory symptoms (such as rhinorrhea and sore throat) compared to 11.4% of adults 65 years and older.

### Table 3. Self or proxy-reported symptoms among confirmed cases of COVID-19 by age group: Ontario, January 15, 2020 to July 13, 2020

<table>
<thead>
<tr>
<th>Symptom</th>
<th>&lt;20 years of age (n=1,895)</th>
<th>% of cases &lt;20 years (n=1,895)</th>
<th>20-64 years (n=24,706)</th>
<th>% of cases 20-64 years (n=24,706)</th>
<th>65+ years (n=10,339)</th>
<th>% of cases 65+ years (n=10,339)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asymptomatic</td>
<td>452</td>
<td>23.9</td>
<td>3,609</td>
<td>14.6</td>
<td>2,051</td>
<td>19.8</td>
</tr>
<tr>
<td>At least one symptom</td>
<td>1,332</td>
<td>70.3</td>
<td>19,280</td>
<td>78.0</td>
<td>6,485</td>
<td>62.7</td>
</tr>
<tr>
<td>Fever, chills, and/or sweats</td>
<td>690</td>
<td>36.4</td>
<td>10,785</td>
<td>43.7</td>
<td>3,821</td>
<td>37.0</td>
</tr>
<tr>
<td>Cough</td>
<td>539</td>
<td>28.4</td>
<td>11,187</td>
<td>45.3</td>
<td>3,264</td>
<td>31.6</td>
</tr>
<tr>
<td>Respiratory</td>
<td>137</td>
<td>7.2</td>
<td>3,884</td>
<td>15.7</td>
<td>1,245</td>
<td>12.0</td>
</tr>
<tr>
<td>Upper respiratory</td>
<td>562</td>
<td>29.7</td>
<td>7,798</td>
<td>31.6</td>
<td>1,175</td>
<td>11.4</td>
</tr>
<tr>
<td>Gastrointestinal</td>
<td>247</td>
<td>13.0</td>
<td>4,487</td>
<td>18.2</td>
<td>1,263</td>
<td>12.2</td>
</tr>
<tr>
<td>Headache</td>
<td>472</td>
<td>24.9</td>
<td>8,075</td>
<td>32.7</td>
<td>703</td>
<td>6.8</td>
</tr>
<tr>
<td>Neurologic</td>
<td>60</td>
<td>3.2</td>
<td>1,171</td>
<td>4.7</td>
<td>315</td>
<td>3.0</td>
</tr>
<tr>
<td>Loss of taste and/or smell</td>
<td>188</td>
<td>9.9</td>
<td>3,912</td>
<td>15.8</td>
<td>225</td>
<td>2.2</td>
</tr>
<tr>
<td>Cardiac</td>
<td>51</td>
<td>2.7</td>
<td>1,159</td>
<td>4.7</td>
<td>128</td>
<td>1.2</td>
</tr>
<tr>
<td>Pain and/or fatigue</td>
<td>329</td>
<td>17.4</td>
<td>7,417</td>
<td>30.0</td>
<td>1,754</td>
<td>17.0</td>
</tr>
<tr>
<td>Other</td>
<td>340</td>
<td>17.9</td>
<td>5,394</td>
<td>21.8</td>
<td>1,310</td>
<td>12.7</td>
</tr>
</tbody>
</table>

**Data Source:** iPHIS plus
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 July 13, 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 July 13, 2020

Data Source: iPHIS plus
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 July 13, 2020 at 4 p.m.
  - Information successfully uploaded to the Ministry from Local 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 July 13, 2020 at 2 p.m.
  - iPHIS and iPHIS plus (which includes iPHIS, CORES, The COD and COVID-19 CCMtool) are dynamic disease reporting systems, which allow 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.

Data Caveats:

- The data only represent cases reported to public health units and recorded in iPHIS plus. 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 and 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 > No known epidemiological link > Information pending.
• 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 or Local Systems.

• 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.

• Cases may report multiple symptoms.

• 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.

• 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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