

ENHANCED EPIDEMIOLOGICAL SUMMARY

(ARCHIVED) COVID-19 Infection in Children:
January 15, 2020 to June 30, 2021

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ARCHIVED DOCUMENT

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This report includes the most current information available from CCM as of **July 14, 2021**.

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](#).¹ For up-to-date information on screening guidelines for schools and child care centres, please refer to the provincial COVID-19 school and child care [screening tool](#).² For the purpose of this report, children are defined as cases 17 years of age and under (i.e. up to the day before their 18th birthday). This report includes information on demographic characteristics, laboratory testing, severity of illness, acquisition exposures and variants of concern (VOCs). All data in this report are preliminary and may change as more case reports and case details are received. For detailed information on elementary and secondary school outbreaks and related cases please refer to the [enhanced epidemiological summary](#) on school outbreaks on the Public Health Ontario website.³

Highlights

- Children account for 12.9% of the 545,398 confirmed COVID-19 cases reported in Ontario, yet they account for 18.7% of the Ontario population.
- The cumulative rate of infection among children is approximately 1.6 times lower (2,523.7 per 100,000) than adults (3,932.0 per 100,000). Among children, rates were highest (3,367.6 per 100,000) for 14 to 17 years olds.
- The most frequently reported acquisition exposure type among cases in children was close contact with a confirmed case (53,103 cases, 75.7%). In contrast, the proportion of children reporting a link to an outbreak setting was low (6,239 cases, 8.9%).
- The proportion of severe outcomes, including hospitalizations, ICU admission, deaths and complications are much lower among cases in children compared to adults. Two deaths have been reported in children compared to 9,255 deaths reported among adults.
- The most commonly identified VOC in children was B.1.1.7 (Alpha), representing 80% of all confirmed COVID-19 cases with a VOC or mutation detected. In more recent weeks, the most commonly identified VOC in children has been B.1.617.2 (Delta). Among cases with an identified VOC mutation, similar percentages of each lineage were found in children and adults.
- On May 5, 2021, Health Canada authorized the use of the Pfizer-BioNTech COVID-19 vaccine in children 12 years old and older. Of the 636,632 children 12 to 17 years-old with at least one dose by July 10, 2021 there were 5 breakthrough cases (<0.01%)⁴ (data not presented).

Overview

Since January 15, 2020, 12.9% (70,187 cases) of the total of 545,398 confirmed COVID-19 cases in Ontario were reported in children (Table 1), yet children account for 18.7% of the Ontario population. The rate of infection among children is approximately 1.6 times lower (2,523.7 per 100,000) than adults (3,932.0 per 100,000). Among cases in children, rates of illness increased with each age group and were highest among those 14-17 year of age (3,367.6 per 100,000).

Table 1. Confirmed cases of COVID-19: Ontario, January 15, 2020 to June 30, 2021

Age group	Number of cases	Rate per 100,000 population	Number of male cases	% of male cases within each age group
<4 years	11,244	1,848.5	5,814	51.7
4-8 years	16,658	2,198.0	8,603	51.6
9-13 years	20,871	2,678.9	10,739	51.5
14-17 years	21,414	3,367.6	10,906	50.9
<18 years	70,187	2,523.7	36,062	51.4

Age group	Number of cases	Rate per 100,000 population	Number of male cases	% of male cases within each age group
18-39 years	221,879	4,918.0	114,434	51.6
40-64 years	184,862	3,761.7	90,396	48.9
≥65 years	68,375	2,573.0	30,886	45.2
≥18 years	475,116	3,932.0	235,716	49.6
Total	545,398	3,669.2	271,814	49.8

Note: Totals include cases where age was unknown.

Data Source: CCM

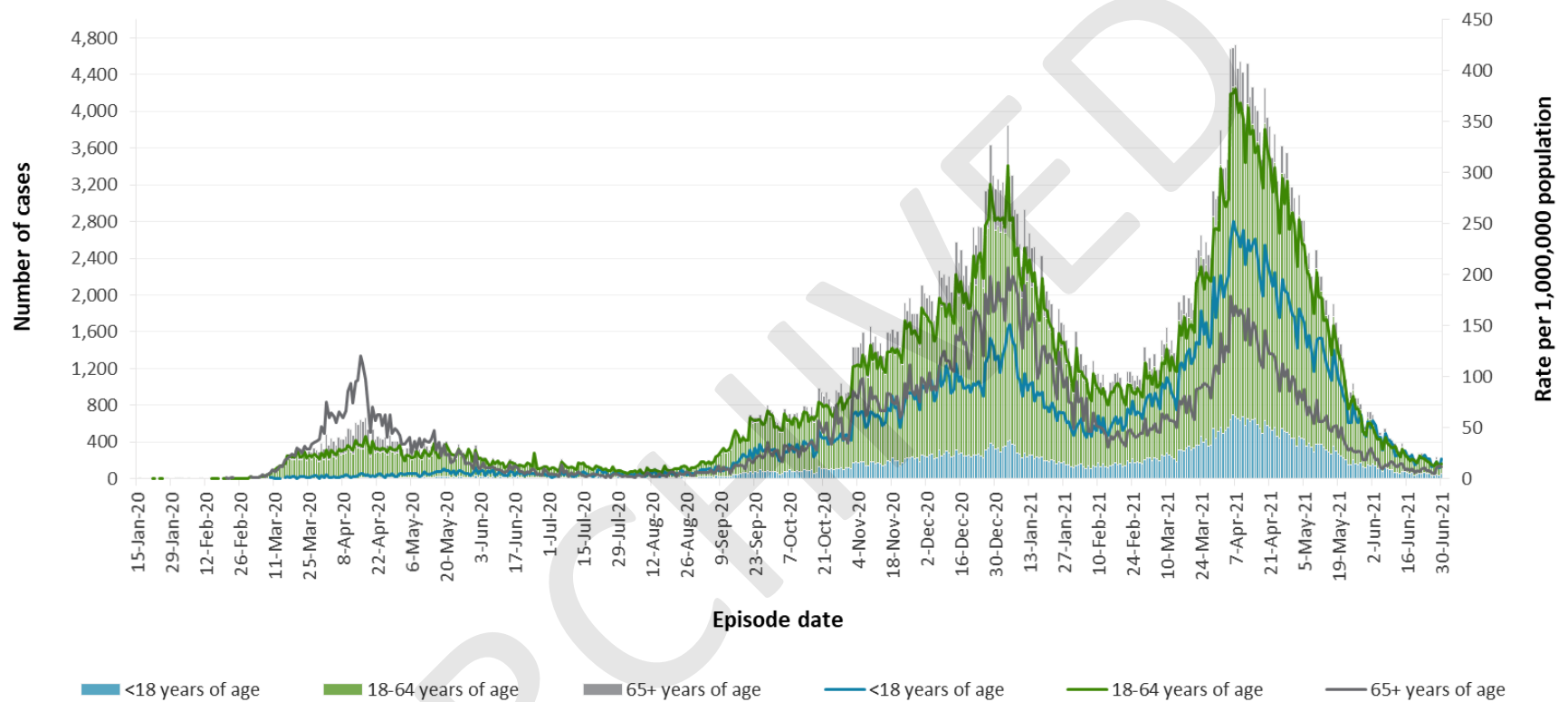
Temporal Trends

Figure 1a shows the number and daily rate of all confirmed COVID-19 cases reported in Ontario. Cases are shown by episode date (an estimate of illness onset) and classified by age group. Figure 1b shows the daily rate of confirmed COVID-19 cases in children (under 18 years of age) by episode date and classified by age group.

Figure 2a shows the total number of tests in children by age group, as well as the percent of the total tests that were positive. Figure 2b shows the number of daily confirmed COVID-19 cases in children by age group and the percent of the total tests that were positive.

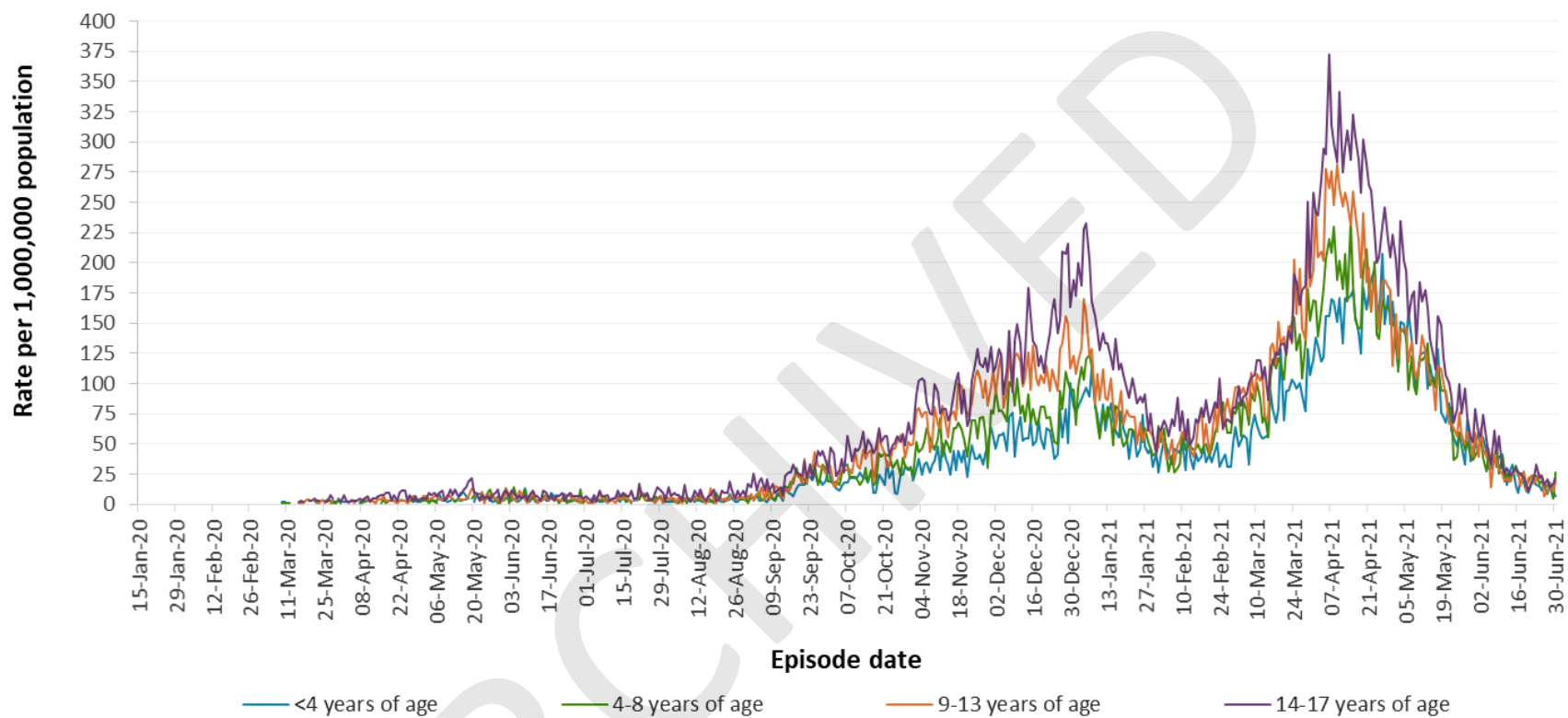
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Figure 1a. Confirmed cases and rates of COVID-19 by age group and episode date: Ontario, January 15, 2020 to June 30, 2021



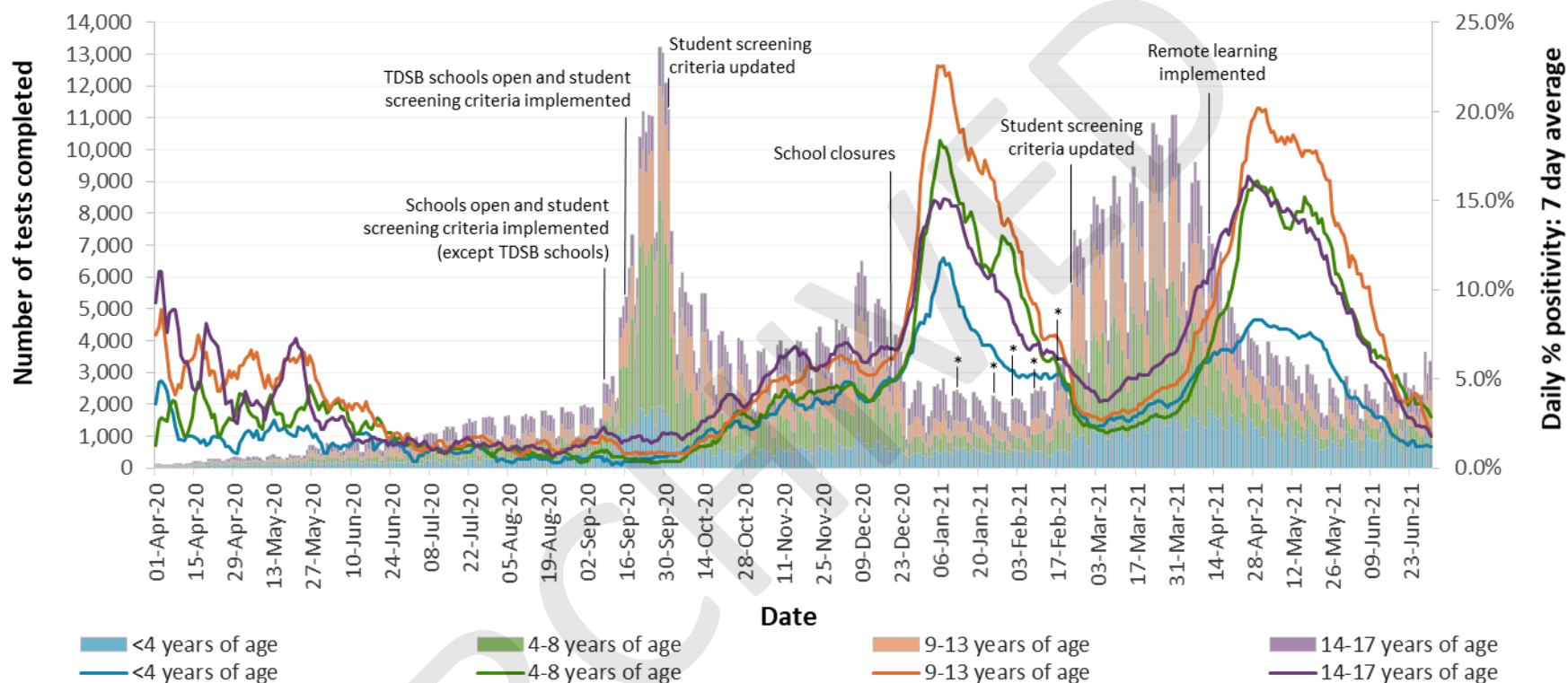
Data Source: CCM

Figure 1b. Confirmed rates of COVID-19 in children by age group and episode date: Ontario, January 15, 2020 to June 30, 2021



Data Source: CCM

Figure 2a. Number of COVID-19 tests completed in children and percent positivity by age group: Ontario, April 1, 2020 to June 30, 2021

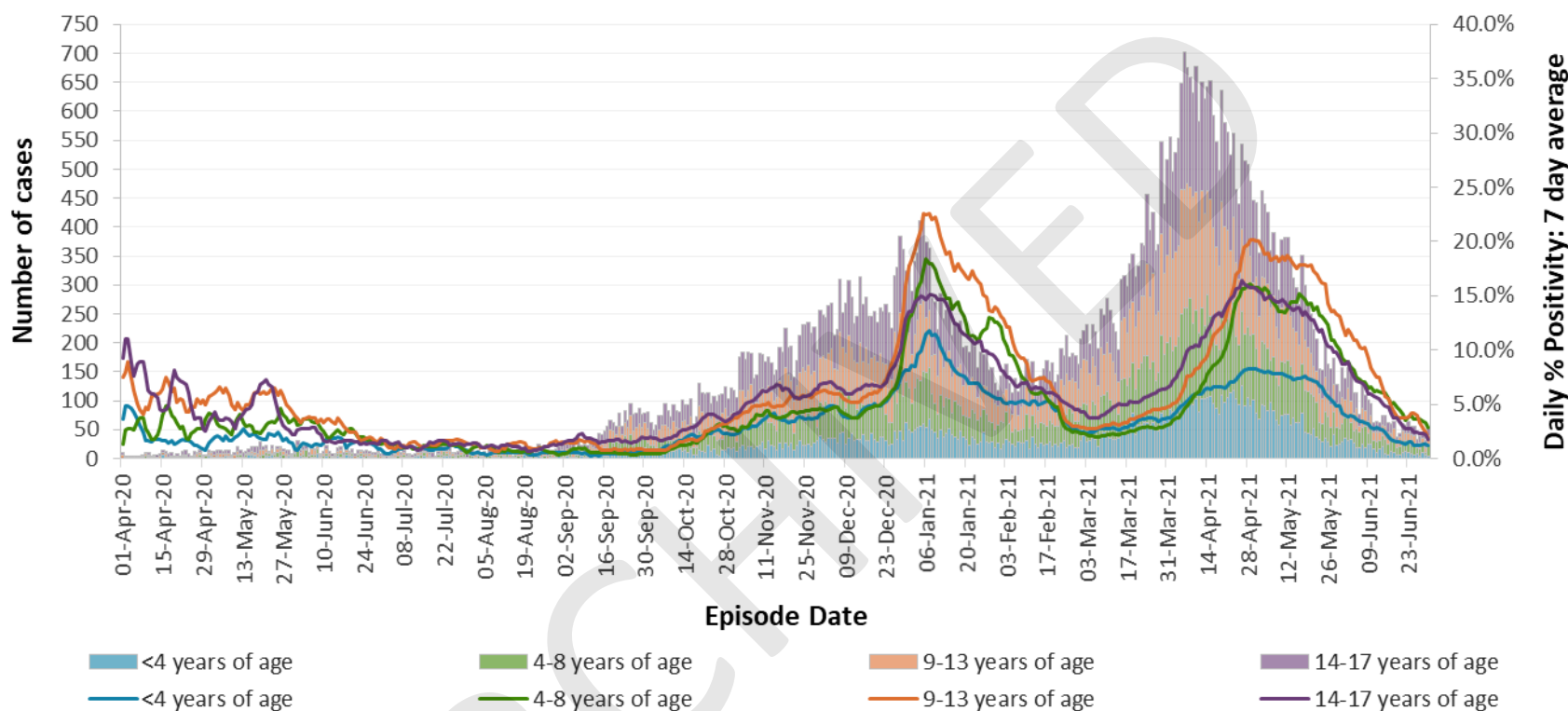


Note: Bars indicate number of tests completed and lines indicate daily percent positivity. Percent positivity is influenced by a number of factors including disease incidence and test seeking behaviour among persons with and without COVID-19. Persons with COVID-19 may be more likely to be tested than those without it at times when testing volumes are lower.

The arrow in December indicates the start of winter break, and school closures for in person attendance. Asterisks (*) indicate school reopening dates for different public health units (See [Table A1](#) in Appendix A for details).

Data Source: OLIS

Figure 2b. Confirmed cases of COVID-19 in children and percent positivity by age group: Ontario, April 1, 2020 to June 30, 2021



Note: Bars indicate number of COVID-19 cases in children by age group and lines indicate daily percent positivity. Percent positivity is influenced by a number of factors including disease incidence and test seeking behaviour among persons with and without COVID-19. Persons with COVID-19 may be more likely to be tested than those without at times when testing volumes are lower.

Data Source: CCM and OLIS

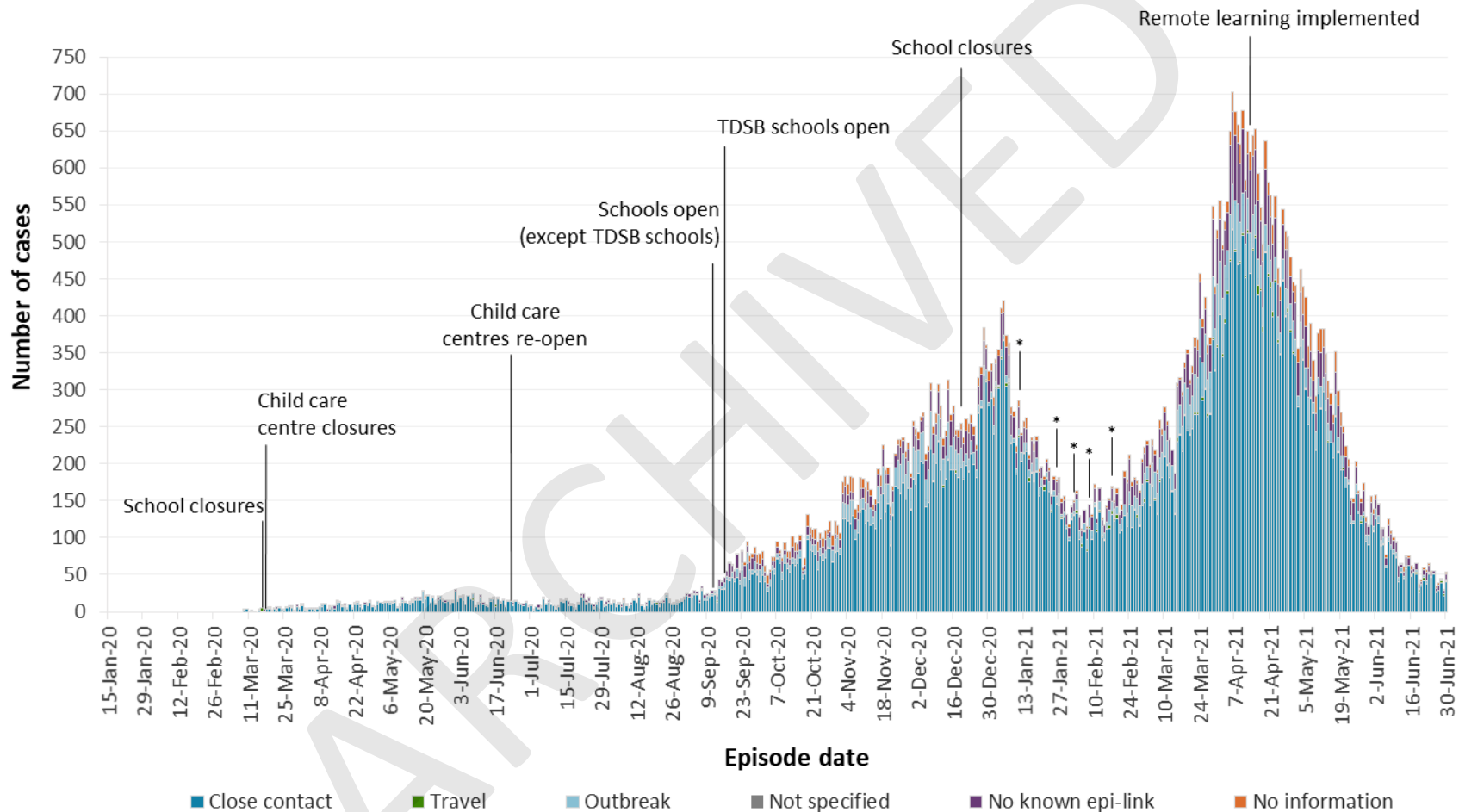
Acquisition Exposures

Figure 3 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. Each case is assigned to one exposure type. The dates corresponding to school and daycare closures and re-openings are also shown.

Figures 4a and 4b compare the overall frequency of types of exposures reported among children to adults 18-64 years of age and 65 years of age and older.

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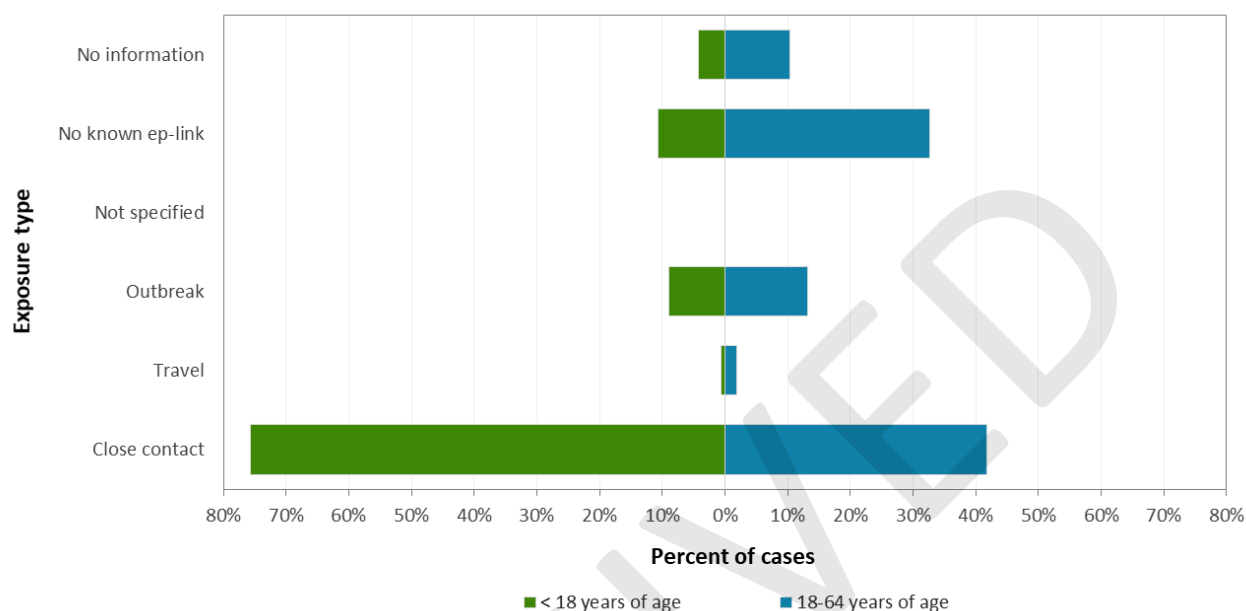
Figure 3. Confirmed cases of COVID-19 in children by ranked exposure type and episode date: Ontario, January 15, 2020 to June 30, 2021



Notes: The arrow in March 2020 indicates the start of March Break, the first day of school closures for in-person attendance. The arrow in December indicates the start of winter break, and school closures for in-person attendance. Asterisks (*) indicate school reopening dates for different public health units (See [Table A1](#) in Appendix A for details). TDSB = Toronto District School Board

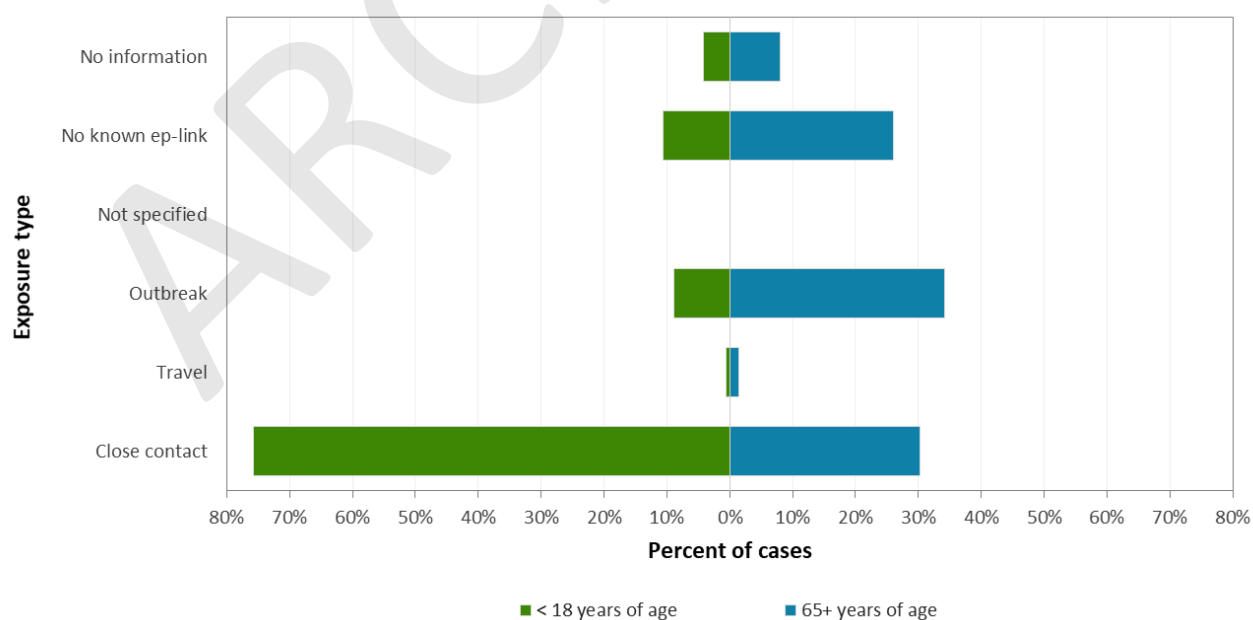
Data Source: CCM

Figure 4a. Proportion of confirmed cases of COVID-19 in children and adults 18 to 64 years of age by ranked exposure type: Ontario, January 15, 2020 to June 30, 2021



Data Source: CCM

Figure 4b. 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 June 30, 2021



Data Source: CCM

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 (0.6% and 0.1%, respectively) compared to adults 18 years of age and older (5.8% and 1.1%, respectively). As of the data extract date for this report, two deaths have been reported in children, compared to 9,255 deaths reported among adults. The deaths occurred in children under 14 years of age.

Table 2. Age distribution of confirmed cases of COVID-19 by severity of illness indicators: Ontario, January 15, 2020 to June 30, 2021

Age group	Number of cases	Ever hospitalized	Age-specific hospital admissions (%)	Ever in ICU	Age-specific ICU admissions (%)	Cumulative deaths*	Age-specific deaths (%)*
<4 years	11,244	190	1.7	10	0.1	-	-
4-8 years	16,658	48	0.3	6	0.0	-	-
9-13 years	20,871	68	0.3	12	0.1	-	-
14-17 years	21,414	95	0.4	11	0.1	0	0.0
<18 years	70,187	401	0.6	39	0.1	2	0.0
18-39 years	221,879	2,806	1.3	405	0.2	85	0.0
40-64 years	184,862	9,438	5.1	2,345	1.3	1,047	0.6
≥65 years	68,375	15,330	22.4	2,603	3.8	8,123	11.9
≥18 years	475,116	27,574	5.8	5,353	1.1	9,255	1.9
Total	545,398	27,978	5.1	5,393	1.0	9,258	1.7

Note: Totals include cases where age was unknown.

* Two deaths occurred among children under the age of 14.

Data Source: CCM

Variant COVID-19 Cases

Table 3 shows the cumulative distribution of COVID-19 cases in children and adults with a mutation or variant of concern (VOC) detected. Figure 5 shows the number of daily confirmed COVID-19 cases with a mutation or VOC in children over time. The most commonly identified VOC in children was B.1.1.7 (Alpha), representing 80% of all confirmed COVID-19 cases. In more recent weeks, the most commonly identified VOC in children has been B.1.617.2 (Delta). Among cases with an identified VOC mutation, similar percentages of each lineage were found in children and adults.

For more information on whole genome sequencing in the province, please refer to the [SARS CoV-2 Whole Genome Sequencing in Ontario](#) report.

Table 3. Summary of confirmed COVID-19 cases with a mutation or VOC detected by age group: Ontario, January 15, 2020 to June 30, 2021

Age group	Cumulative count for Lineage B.1.1.7 (Alpha)*	Cumulative count for Lineage B.1.351 (Beta)**	Cumulative count for Lineage P.1 (Gamma)***	Cumulative count for Lineage B.1.617.2 (Delta)†	Cumulative count for mutations‡	Cumulative Cases counts as of June 30, 2021
<4 years	3,919	29	89	111	660	4,808
4-8 years	5,283	46	156	140	987	6,612
9-13 years	6,462	61	202	127	1,147	7,999
14-17 years	6,706	65	228	129	1,120	8,248
<18 years	22,370	201	675	507	3,914	27,667
18-39 years	59,920	514	2,006	1,317	10,271	74,028
40-64 years	49,540	560	1,764	936	7,835	60,635
≥65 years	12,722	189	502	271	2,108	15,792
≥18 years	122,182	1,263	4,272	2,524	20,214	150,455
Total	144,563	1,464	4,947	3,031	24,130	178,135

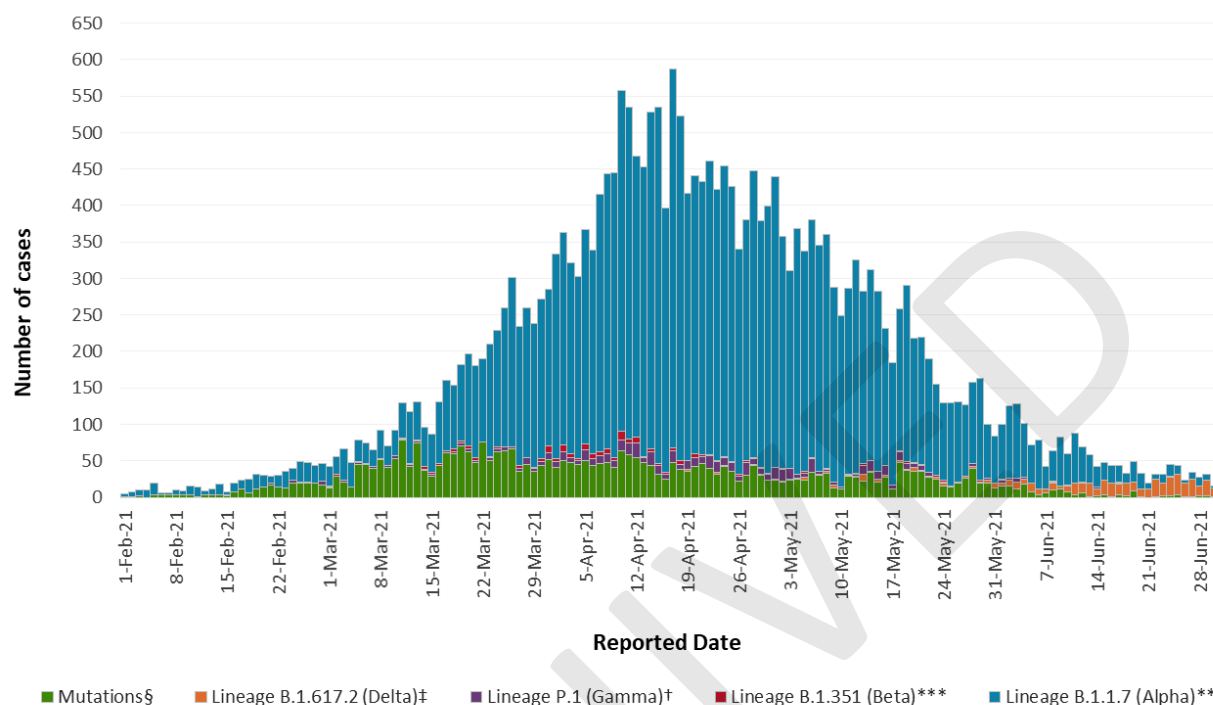
Note: Totals include cases where age was unknown.

Interpret the VOC and mutation trends with caution due to the varying time required to complete VOC testing and/or genomic analysis following the initial positive test for SARS-CoV-2. Due to the nature of the genomic analysis, test results may be completed in batches. Data corrections or updates can result in case records being removed and or updated from past reports and may result in subset totals differing from past publicly reported

case counts. Data for cases with a B.1.1.7, B.1.351, and P.1 lineage detected are determined using the Investigation Subtype field in CCM only. Changes to the VOC testing algorithm may impact counts and trends. Further details can be found in the data caveats section.*Includes all confirmed COVID-19 cases where lineage B.1.1.7 was identified by genomic analysis and those presumed to be B.1.1.7 based on positive N501Y and negative E484K mutation in the Investigation Subtype field**Includes B.1.351 cases identified by genomic analysis and those presumed to be B.1.351 based on 'Mutation K417N+ and N501Y+ and E484K+' in the Investigation Subtype field***Includes P.1 cases identified by genomic analysis and those presumed to be P.1 based on 'Mutation K417T+ and N501Y+ and E484K+' in the Investigation Subtype field†Includes B.1.617.2 cases identified by genomic analysis. Mutations common to B.1.617.2 are not included in the current VOC mutation test.‡Mutations includes all confirmed COVID-19 cases with the following mutations detected, reported from the Investigation Subtype field: N501Y and E484K, N501Y (E484K unknown), E484K (N501Y negative), E484K (N501Y unknown).

Data Source: CCM

Figure 5. Confirmed COVID-19 cases in children with a mutation or VOC detected: Ontario, February 1, 2021 to June 30, 2021



Note: Reported date is based on the date the case was reported, not the date that the VOC or mutation was identified. Further details on testing for variants of concern can be found in the technical notes. Interpret the VOC and mutation trends with caution due to the varying time required to complete testing and/or genomic analysis following the initial positive test for SARS-CoV-2. Data for calculating the change in cases and the cumulative case count uses data from the Investigation Subtype field only. Data for cases with a B.1.1.7, B.1.351, P.1 and B.1.617.2 lineage detected or any of the mutations listed above are determined using the Investigation Subtype field only. Changes to the VOC testing algorithm may impact counts and trends. Further details can be found in the data caveats section and [Table A2](#) in Appendix A.

**Includes all confirmed COVID-19 cases where lineage B.1.1.7 was identified by genomic analysis and those presumed to be B.1.1.7 based on positive N501Y and negative E484K mutation in the Investigation Subtype field

***Includes B.1.351 cases identified by genomic analysis and those presumed to be B.1.351 based on 'Mutation K417N+ and N501Y+ and E484K+' in the Investigation Subtype field

†Includes P.1 cases identified by genomic analysis and those presumed to be P.1 based on 'Mutation K417T+ and N501Y+ and E484K+' in the Investigation Subtype field

‡Includes B.1.617.2 cases identified by genomic analysis. Mutations common to B.1.617.2 are not included in the current VOC mutation test.

§ Includes cases identified as having any of the following mutation combinations: N501Y and E484K, E484K (N501Y negative), E484K (N501Y unknown)

Data Source: CCM

Technical Notes

Data Sources

- The data for this report were based on information successfully extracted from the Public Health Case and Contact Management Solution (CCM) for all PHUs by PHO as of **July 14, 2021 at 1 p.m.** for cases reported from February 1, 2021 onwards and as of **July 12, 2021 at 9 a.m.** for cases reported up to January 31, 2021.
- VOC data for this report were based on information successfully extracted from CCM for all PHUs by PHO as of **July 14, 2021 at 1 p.m.** for cases reported from April 1, 2021 onwards and as of **July 12, 2021 at 9 a.m.** for cases reported up to March 31, 2021.
- COVID-19 vaccination data were based on information successfully extracted from the Ontario Ministry of Health's COVaxON application as of **July 12, 2021 at approximately 7 a.m.** COVaxON data was subsequently linked to COVID-19 case data based on information successfully extracted from the Public Health Case and Contact Management Solution (CCM) for all PHUs by PHO as of **July 12, 2021 at 1 p.m.**
- CCM and COVaxON are dynamic disease reporting systems, which allow ongoing updates to data previously entered. As a result, data extracted from CCM and COVaxON 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 Ministry, IntelliHEALTH Ontario. Data were extracted on November 26, 2019.
- COVID-19 test data were based on information from The Provincial COVID-19 Diagnostics Network, reported by member microbiology laboratories.

Data Caveats and Methods: Case Data

- The data only represent cases reported to public health units and recorded in CCM or COVaxON. 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 CCM data entry due to weekend staffing may result in lower case counts than would otherwise be recorded.
- Only cases meeting the confirmed case classification as listed in the [MOH Case Definition – Coronavirus Disease \(COVID-19\) document](#) are included in the report counts from CCM.¹
- Cases of confirmed reinfection, as defined in the provincial case definitions, are counted as unique investigations. Reinfection cases include cases for persons (CCM clients) with two or more confirmed case investigations where the case investigations after the first one have the reinfection checkbox marked as 'Yes'.
- Case classification information may be updated for individuals with a positive result issued from a point-of-care assays.

- The number of tests performed does not reflect the number of specimens or persons tested. More than one test may be performed per specimen or per person. As such, the percentage of tests that were positive does not necessarily translate to the number of specimens or persons testing positive.
- Daily (7-day averages) for percent positivity represent rolling averages for the seven-day period ending on the reporting date. Rolling averages are used to account for fluctuations that may occur in the data.
- Reported date is the date the case was reported to the public health unit.
- Case episode date represents an estimate of disease onset. This date is calculated based on the earliest date of symptom onset, specimen collection/test date, or the date reported to the public health unit.
- Cases with missing episode dates were excluded from date-specific analysis.
- Cases with unknown ages were excluded from age-specific analyses.
- Hospitalization includes all cases for which a hospital admission date was reported or hospitalization/ICU was reported as 'Yes' at the time of data extraction. It includes cases that have been 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 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 have been treated or that are currently being treated in an ICU.
- Orientation of case counts by geography is based on the permanent health unit. This is equivalent to the diagnosing health unit (DHU) in iPHIS. DHU refers to the case's public health unit of residence at the time of illness onset and not necessarily the location of exposure. Cases for which the DHU was reported as MOH-PHO (to signify a case that is not a resident of Ontario) have been excluded from the analyses.
- Likely source of acquisition is determined by examining the epidemiologic link and epidemiologic link status fields in CCM. If no epidemiologic link is identified in those fields the risk factor fields are examined to determine whether a case travelled, was associated with a confirmed outbreak, was a contact of a case, had no known epidemiological link (sporadic community transmission) or was reported to have an unknown source/no information was reported. Some cases may have no information reported if the case is untraceable, was lost to follow-up or referred to FNIHB. Cases with multiple 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 > no known epidemiological link > information missing or unknown
 - For cases with an episode date *before* April 1, 2020: Travel > outbreak-associated > close contact of a confirmed case > no known epidemiological link > information missing or unknown

- Deaths are determined by using the outcome field in CCM. Any case marked 'Fatal' is included in the deaths data. The CCM field Type of Death is not used to further categorize the data.
 - The date of death is determined using the outcome date field for cases marked as 'Fatal' in the outcome field.
- COVID-19 cases from CCM for which the Classification and/or Disposition was reported as ENTERED IN ERROR, DOES NOT MEET DEFINITION, IGNORE, DUPLICATE, or any variation on these values have been excluded. The provincial case count for COVID-19 may include some duplicate records, if these records were not identified and resolved. Public Health Ontario conducts testing and genomic analyses for SARS-CoV-2 positive specimens using the criteria outlined here: <https://www.publichealthontario.ca/en/laboratory-services/test-information-index/covid-19-voc>
- Lineage nomenclature is dynamic. PANGO lineage naming and assignment may change as more samples are sequenced and analyzed.
- Variant status may be updated based on scientific evidence. Variants designated as a VOC in Canada is available on the [Public Health Agency of Canada's SARS-CoV-2 Variants webpage](#).
- Changes to the VOC testing algorithm may occur over time and trends should be interpreted with caution. Since February 3, 2021 all PCR positive SARS-CoV-2 specimens with Ct values ≤ 35 are tested for a N501Y mutation. As of March 22, 2021, positive specimens with a Ct ≤ 35 are tested for both the N501Y and E484K mutation, with all E484K positive specimens with a Ct ≤ 30 forwarded for further genomic analysis. If found to be positive for the N501Y mutation only, no further genomic analysis are performed as these are presumed to be B.1.1.7. As of May 26, 2021, cases where a E484K mutation is detected will no longer be reflexed for sequencing as VOC testing labs switched to a representative sampling method where only a proportion of all positives with a Ct ≤ 30 are forwarded for further genomic analysis. The laboratory detection of a variant of concern is a multi-step process. Samples that test positive for SARS-CoV-2 and have a cycle threshold (Ct) value ≤ 35 can be tested for mutations common to variants of concern. If positive for the mutation of interest with a Ct value of ≤ 30 , these samples may then undergo genomic analyses to identify the VOC lineage. VOC lineages may still be confirmed using genomic analysis despite specific S gene mutation(s) being documented as 'unable to complete' due to poor sequence quality at the genome position.
- VOC testing data are analyzed for cases with a reported date on or after February 07, 2021. VOC testing data are based on CCM information reported within the laboratory object for select Logical Observation Identifiers Names and Codes (LOINC) and supplemented with information from the Investigation Subtype field. A confirmed Case Investigation is assigned a VOC test value (e.g., VOC test detected, VOC test not detected) based on the following hierarchy:
 - If multiple laboratory results are identified, a VOC test value is assigned based on the following hierarchy: Detected > Not Detected > Unable to complete
 - If a laboratory result is 'Not Detected' or 'Unable to complete', but data on the Investigation Subtype field is listed as a lineage or mutation common to a VOC, then the VOC test value is set to 'Detected'
- If a VOC is identified through genomic analysis cases initially classified as a mutation may be updated and moved to the appropriate lineage (B.1.1.7, B.1.351, P.1 and B.1.617.2)

- Provincial whole genome sequencing strategy moved to a representative sample and PHO began sequencing 10% of eligible samples on May 2, 50% on May 30, and 100% on June 14. Other VOC PCR testing laboratories were asked to submit 10% of eligible samples to the Ontario COVID-19 Genomics Network (OCGN) on May 26, 50% on June 2, and 100% on June 14.
- LOINC codes are a set of internationally used result description codes. In the absence of a standard LOINC, Ontario Health can create local result codes, which are identified with an 'XON' prefix. LOINC codes incorporate details of the result value (e.g. test method, target detected - such as IgG, DNA, isolate etc.) and are unique to each result.
- VOC testing data in this report are assigned on a per case basis. Multiple laboratory results may be associated to a single case investigation, but for analysis purposes are only counted once
 - The percent of cases that test VOC positive is calculated by taking the number of VOC test positive, divided by the total number of confirmed COVID-19 cases for a given reported date.
- The VOC percent positive may be higher than described in this report. As testing algorithms change, the VOC percent positivity may not be reflective of the exact number of COVID-19 cases due to VOCs.
- Only CCM case investigations with a CONFIRMED classification have their laboratory records with VOC testing information included in the percent positivity calculations.

References

1. Ontario. Ministry of Health. Case definition – coronavirus disease (COVID-19) [Internet]. Toronto, ON: Queen's Printer for Ontario; 2020 [cited 2021 Aug 03]. Available from: http://www.health.gov.on.ca/en/pro/programs/publichealth/coronavirus/docs/2019_case_definition.pdf
2. Government of Ontario. COVID-19 school and child care screening [Internet]. Toronto, ON: Queen's Printer for Ontario; 2021 [modified 2021 Jul 20; cited 2021 Aug 03]. Available from: <https://covid-19.ontario.ca/school-screening/>
3. Ontario Agency for Health Protection and Promotion (Public Health Ontario). COVID-19 in Ontario: elementary and secondary school outbreaks and related cases, August 30, 2020 to April 24, 2021 [Internet]. Toronto, ON: Queen's Printer for Ontario; 2021 [cited 2021 Aug 03]. Available from: <https://www.publichealthontario.ca/-/media/documents/ncov/epi/2020/12/covid-19-school-outbreaks-cases-epi-summary.pdf?la=en>
4. Ontario Agency for Health Protection and Promotion (Public Health Ontario). Confirmed cases of COVID-19 following vaccination in Ontario: December 14, 2020 to July 10, 2021 [Internet]. Toronto, ON: Queen's Printer for Ontario; 2021 [cited 2021 Jul 30]. Available from: https://www.publichealthontario.ca/-/media/documents/ncov/epi/covid-19-epi-confirmed-cases-post-vaccination.pdf?sc_lang=en

Appendix A

Table A1. Timeline of school reopening dates across Ontario following school closures for the holiday break

Reported Date	Event
January 11, 2021	<ul style="list-style-type: none"> Schools in the following public health units re-opened for in-person attendance: <ul style="list-style-type: none"> <i>Algoma Public Health</i> <i>North Bay Parry Sound District Health Unit</i> <i>Northwestern Health Unit</i> <i>Porcupine Health Unit</i> <i>Public Health Sudbury & Districts</i> <i>Thunder Bay District Health Unit</i> <i>Timiskaming Health Unit</i>
January 25, 2021	<ul style="list-style-type: none"> Schools in the following public health units re-opened for in-person attendance: <ul style="list-style-type: none"> <i>Grey Bruce Health Unit</i> <i>Haliburton, Kawartha, Pine Ridge District Health Unit</i> <i>Hastings Prince Edward Public Health</i> <i>Kingston, Frontenac and Lennox & Addington Public Health</i> <i>Leeds, Grenville & Lanark District Health Unit</i> <i>Peterborough Public Health</i> <i>Renfrew County and District Health Unit</i>
February 1, 2021	<ul style="list-style-type: none"> Schools in the following public health units re-opened for in-person attendance: <ul style="list-style-type: none"> <i>Eastern Ontario Health Unit</i> <i>Middlesex-London Health Unit</i> <i>Ottawa Public Health</i> <i>Southwestern Public Health</i>
February 8, 2021	<ul style="list-style-type: none"> Schools in the following public health units re-opened for in-person attendance: <ul style="list-style-type: none"> <i>Brant County Health Unit</i>

Reported Date	Event
	<ul style="list-style-type: none"> • <i>Chatham-Kent Public Health</i> • <i>City of Hamilton Public Health Services</i> • <i>Durham Region Health Department</i> • <i>Haldimand-Norfolk Health Unit</i> • <i>Halton Region Public Health</i> • <i>Huron Perth Public Health</i> • <i>Lambton Public Health</i> • <i>Niagara Region Public Health</i> • <i>Region of Waterloo Public Health and Emergency Services</i> • <i>Simcoe Muskoka District Health Unit</i> • <i>Wellington-Dufferin-Guelph Public Health</i> • <i>Windsor-Essex County Health Unit</i>
February 16, 2021	<ul style="list-style-type: none"> • Schools in the following public health units re-opened for in-person attendance: <ul style="list-style-type: none"> • <i>Peel Public Health</i> • <i>Toronto Public Health</i> • <i>York Region Public Health</i>
April 12, 2021	<ul style="list-style-type: none"> • Remote learning implemented in the province

Table A2. Timeline of mutation screening implementations and provincial whole genome sequencing strategy

Reported Date	Event
February 3, 2021	<p>Mutation screening implemented for N501Y</p> <ul style="list-style-type: none"> All PCR positive SARS-Co-V-2 specimens with Ct values ≤ 35 are tested for a N501Y mutation
March 22, 2021	<p>Mutation screening implemented for E484K in addition to N501Y</p> <ul style="list-style-type: none"> All PCR positive SARS-Co-V-2 specimens with a Ct ≤ 35 are tested for both the N501Y and E484K mutation, with all E484K positive specimens with a Ct ≤ 30 forwarded for further genomic analysis. A 5% subset of SARS-CoV-2-positive specimens in which no mutations were detected by the real-time PCR were selected for genome sequencing for surveillance purposes.
May 2, 2021	<p>10% of samples undergo whole genome sequencing</p> <ul style="list-style-type: none"> Provincial whole genome sequencing strategy moved to a representative sample and PHO began sequencing 10% of eligible samples
May 26, 2021	<p>Modifications for whole genome sequencing based on mutation profile</p> <ul style="list-style-type: none"> Cases where a E484K mutation is detected no longer reflexed for sequencing as VOC testing labs switched to a representative sampling method where only a proportion of all positives with a Ct ≤ 30 are forwarded for further genomic analysis Other VOC PCR testing laboratories were asked to submit 10% of eligible samples to the Ontario COVID-19 Genomics Network (OCGN).
May 30, 2021	<p>50% of samples undergo whole genome sequencing</p> <ul style="list-style-type: none"> Provincial whole genome sequencing strategy moved to a representative sample and PHO began sequencing 50% of eligible samples
June 2, 2021	<p>Other VOC PCR testing laboratories were asked to submit 50% of eligible samples to the Ontario COVID-19 Genomics Network (OCGN).</p>
June 14, 2021	<p>100% of samples undergo whole genome sequencing</p> <ul style="list-style-type: none"> Provincial whole genome sequencing strategy moved to a representative sample and PHO began sequencing 100% of eligible samples and other VOC PCR testing laboratories were asked to submit 100% of eligible samples to the Ontario COVID-19 Genomics Network (OCGN)

Citation

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