Public Health Ontario | Santé publique Ontario

QUICK EPIDEMIOLOGICAL SUMMARY

Confirmed SARS-CoV-2 Variant of Concern Cases from November 29, 2020 to November 12, 2021

Purpose

This brief report summarizes SARS-CoV-2 variants of concern (VOC) and mutation data reported in Ontario between November 29, 2020 and November 12, 2021, from results recorded in the Public Health Case and Contact Management Solution (CCM).

Ontario has been actively testing for the presence of VOCs. The approach initially targeted high priority specimens, followed by universal VOC mutation testing of all SARS-CoV-2 positive specimens in Ontario beginning February 3, 2021.

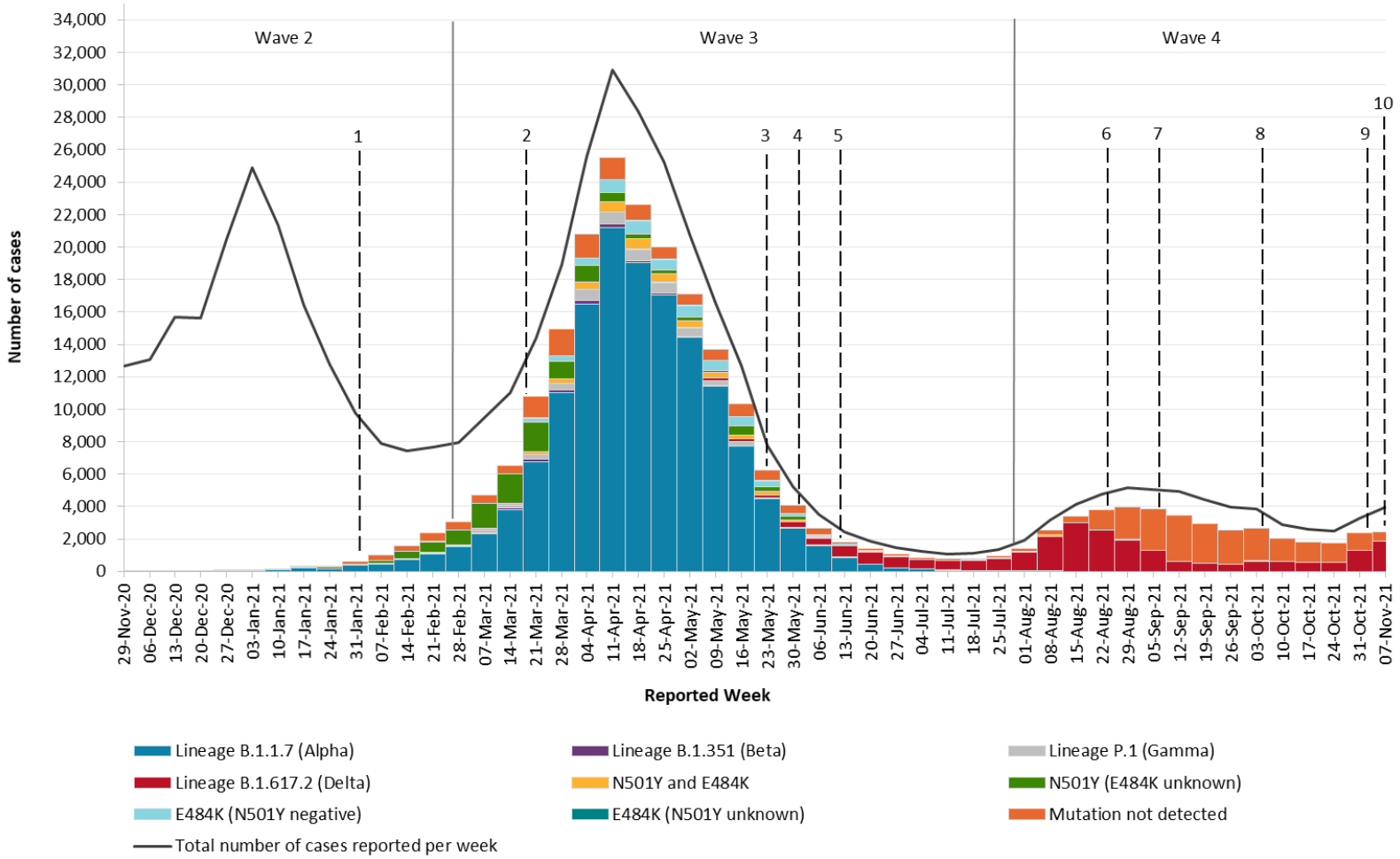
On November 13, 2021, VOC surveillance shifted to rely on surveillance-based sampling and whole genome sequencing. Universal VOC mutation testing was reintroduced in Ontario on December 6, 2021, following emergence of the Omicron variant. Information on current circulating variants of SARS CoV-2 can be found in the weekly SARS-CoV-2 Whole Genome Sequencing in Ontario report.

Summary

- During Wave 2 (September 1, 2020 to February 28, 2021), the first cases of SARS CoV-2 variants B.1.1.7 (Alpha), B.1.351 (Beta) and P.1 (Gamma) were detected in Ontario.
- Early in Wave 3 (March 1, 2021 to July 31, 2021), B.1.1.7 (Alpha) became the dominant circulating variant of SARS CoV-2. In April, B.1.617.2 (Delta) began to circulate in Ontario. As overall cases of SARS-CoV-2 declined through May and June, B.1.617.2 (Delta) began to replace B.1.1.7 (Alpha) as the dominant circulating variant. By early to mid-June B.1.617.2 (Delta) became the dominant circulating variant and remained the dominant variant since that time.
- Of the four VOC circulating in Ontario during the time covered by this report, only B.1.1.7 (Alpha) and B.1.617.2 (Delta) were identified in all 34 public health units. This is reflective of each being the dominant circulating variant at one point in 2021.

Results

Figure 1. Confirmed COVID-19 VOC* cases and total COVID-19 cases from November 29, 2020 to November 12, 2021



Note: *Information on how cases were included in each VOC category can be found in the Data Caveats section. By mid-June 2021, Delta became the dominant circulating variant and remained the dominant variant, thus the absence of mutations (mutation not detected) would suggest presence of Delta.
Data Source: CCM

Table 1. Summary of lab changes to COVID-19 testing in Ontario: November 29, 2020 to November 12, 2021

#	Date	Description
0	Late Dec -21 to 03-Feb-21	High priority specimens were tested for the presence of VOC.
1	03-Feb-21	Starting on this date routine VOC PCR testing begins. All SARS-CoV-2 positive cases reported from this date onward with Ct ≤35 were screened for the N501Y mutation. All N501Y positives with Ct ≤30 were sent for WGS.
2	22-Mar-21	Switch to dual assay that screened for N501Y and E484K mutations for all cases reported from March 22 onward. If N501Y positive and E484K negative the presumed lineage B.1.1.7 (Alpha). If E484K positive (regardless of N501Y status) and Ct ≤30, sent for WGS. 5% of E484K negative specimens were also selected for WGS.
3	26-May-21	Implemented surveillance-based sampling approach for WGS. All VOC-PCR positives with Ct ≤30 considered eligible. Initially 10% of eligible positive specimens sampled.
4	02-Jun-21	Surveillance-based sampling for WGS increased to 50% of eligible
5	14-Jun-21	Surveillance-based sampling for WGS increased to 100% of eligible
6	27-Aug-21	Surveillance-based sampling for WGS decreased to 50% of eligible
7	10-Sep-21	Surveillance-based sampling for WGS decreased to 10% of eligible
8	08-Oct-21	Surveillance-based sampling for WGS increased to 25% of eligible
9	05-Nov-21	Surveillance-based sampling for WGS increased to 100% of eligible
10	12-Nov-21	Discontinuation of VOC PCR testing. All SARS-CoV-2 positives with Ct ≤30 to be sent for WGS.

Table 2. Summary of confirmed COVID-19 VOC cases in Ontario, by public health unit; November 29, 2020 to November 12, 2021

Public Health Unit Name	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)
Algoma Public Health	68	0	15	119
Brant County Health Unit	670	2	97	392
Chatham-Kent Public Health	131	5	16	318
City of Hamilton Public Health Services	5,066	66	105	1,877
Durham Region Health Department	9,524	66	270	895
Eastern Ontario Health Unit	665	46	21	203
Grey Bruce Health Unit	310	0	6	646
Haldimand-Norfolk Health Unit	369	3	23	225
Haliburton, Kawartha, Pine Ridge District Health Unit	446	0	23	179
Halton Region Public Health	5,090	30	169	863
Hastings Prince Edward Public Health	112	0	18	140
Huron Perth Public Health	279	0	12	231
Kingston, Frontenac and Lennox & Addington Public Health	458	2	35	256
Lambton Public Health	438	0	18	232

Public Health Unit Name	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)
Leeds, Grenville & Lanark District Health Unit	294	19	0	106
Middlesex-London Health Unit	3,385	2	124	913
Niagara Region Public Health	4,285	4	20	311
North Bay Parry Sound District Health Unit	235	28	3	113
Northwestern Health Unit	67	0	1	29
Ottawa Public Health	6,851	514	55	880
Peel Public Health	31,189	163	1,774	3,215
Peterborough Public Health	630	4	8	168
Porcupine Health Unit	1,108	2	0	100
Public Health Sudbury & Districts	689	13	10	141
Region of Waterloo Public Health and Emergency Services	3,134	21	98	2,134
Renfrew County and District Health Unit	232	8	7	24
Simcoe Muskoka District Health Unit	4,009	36	174	924
Southwestern Public Health	690	3	21	430
Thunder Bay District Health Unit	104	1	2	57

Public Health Unit Name	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)
Timiskaming Health Unit	84	1	0	15
Toronto Public Health	46,074	375	1,524	4,831
Wellington-Dufferin-Guelph Public Health	2,085	1	81	563
Windsor-Essex County Health Unit	1,857	8	19	1,464
York Region Public Health	15,877	79	482	2,004
TOTAL ONTARIO	**146,505**	**1,502**	**5,231**	**24,998**

Note: Information on how cases were included in each VOC category can be found in the Data Caveats section.
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 as of November 29, 2021 at 9 a.m. for cases reported up to January 31, 2021, and as of December 1 2021 at 1 p.m. for cases reported from February 1, 2021 onwards.

- CCM is a dynamic disease reporting system, which allows ongoing updates to data previously entered. As a result, data extracted from CCM represent a snapshot at the time of extraction and may differ from previous or subsequent reports.

Data Caveats

- Reported date is the date the case was reported to the public health unit.

- 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.

- Counts by lineage are an underestimate of the true number of cases since only a proportion of samples were sent for genomic sequencing.

- Lineage nomenclature is dynamic. PANGO lineage naming and assignment may change from previous reports as more samples are sequenced and analyzed.

- Variant status may be updated based on scientific evidence. Information on variants designated as a VOC in Canada is available on the Public Health Agency of Canada's SARS-CoV-2 Variants webpage.

- The laboratory detection of a variant of concern is a multi-step process. Samples that tested positive for SARS-CoV-2 and had a cycle threshold (Ct) value ≤ 35 were tested for mutations common to variants of concern (e.g., N501Y). If positive for the mutation of interest with a Ct value of ≤30, these samples may have undergone genomic sequencing to identify the VOC lineage. VOC lineages may have been confirmed using genomic sequencing despite specific S gene mutation(s) being documented as 'unable to complete' due to poor sequence quality at the genome position. Specific S gene mutation results derived from whole genome sequencing were removed from the test report in May 2021.

- If a VOC is identified through genomic sequencing, cases initially classified as a mutation may be updated and moved to the appropriate lineage (B.1.1.7 (Alpha), B.1.351 (Beta), P.1 (Gamma) and B.1.617.2 (Delta)).

- In some instances confirmed cases are assumed to be a lineage based on specific mutation combinations identified through VOC PCR. Cases were presumed to be:
    - B.1.1.7 (Alpha) based on ‘Mutation N501Y+ and E484K - mutation.
    - B.1.351 (Beta) based on ‘Mutation K417N+ and N501Y+ and E484K+’.
    - P.1 (Gamma) based on ‘Mutation K417T+ and N501Y+ and E484K+’.
- The category ‘N501Y (E484K unknown)’ mainly consists of results from before the introduction of the E484K test.
- The category ‘Mutation Not Detected’ includes cases identified as ‘Mutation not detected’ or ‘Mutation N501Y- and E484K-‘.

Citation

Ontario Agency for Health Protection and Promotion (Public Health Ontario). Confirmed SARS-CoV-2 variant of concern cases from November 29, 2020 to November 12, 2021. Toronto, ON: Queen's Printer for Ontario; 2022.

Disclaimer

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