

# COVID-19 epidemiology update: Key updates

Last updated: 2022-12-23

 PDF

Summary of COVID-19 cases, hospitalizations and deaths, cases following vaccination, testing and variants of concern across Canada and over time. Older versions of this report are available on the [archived reports page](#).

## Key updates

**Update schedule:** We update this page every Monday. This page was last updated on December 23, 2022, 10 am ET.

### Holiday period

This page will be updated Friday December 23, 2022, instead of Monday December 26, 2022. The regular update schedule for the webpage will resume on Tuesday, January 3, 2023.

## Weekly highlights

### General trends

- Nationally, COVID-19 case counts and percent positivity were stable in the latest reporting week, while overall outbreak incidence showed signs of an increase.
- Percent positivity has shown general signs of increase over the past three weeks, and in the latest reporting week, many provinces and territories also showed signs of increase.
- However, trends in these indicators of transmission varied across provinces and territories.

### Hospitalizations and deaths

- Nationally, hospital use by COVID-19 patients was stable, while COVID-19 deaths decreased in the latest reporting week.
- The weekly rates of COVID-19 cases hospitalized and admitted to ICU remained highest among individuals aged 80 years and older.

### Variants

- Canada continues to monitor SARS-CoV-2 variants, with steady increases in now dominant immune evasive variants variants BQ.1 and BQ.1.1 while previously dominant BA.5.2 and BA.5.2.1 lineages are declining..

# Latest COVID-19 numbers (Last data update December 23, 2022, 10 am ET)

Weekly change in cases <b>17,345</b>	Total cases <b>4,475,268</b>	Weekly change in deaths <b>227</b>	Total deaths <b>48,948</b>
Weekly tests reported <b>80,681</b>		Weekly percent positivity <b>13.6%</b>	

- Case and death information are up to December 17, 2022.
- Weekly change in cases and deaths includes data from 10 of the 13 Canadian provinces and territories reporting updates for the week of December 11 to December 17, 2022.
- These reflect the changes in the case and death counts at the end of the week compared to the end of the previous week.
- Laboratory testing information is based on data from the Respiratory Virus Detection Surveillance System (RVDSS) (see [Data notes](#)).
- Weekly percent positivity is calculated as the number of positive tests divided by the total number of tests performed during the epidemiological week.
- Laboratory data represents specimens received by labs up to December 17, 2022.
- Due to changes in COVID-19 testing policies in many jurisdictions since December 2021, case counts are under-estimated.
- As of October 19, 2022, the Statistics Canada population estimates as of July 1, 2022 are being used for denominators in rate calculations.

# COVID-19 data products

## COVID-19 surveillance

- [COVID-19 wastewater surveillance dashboard](#)
- [Interactive data map of COVID-19 cases around the world](#)

## COVID-19 vaccination

- [Reported side effects following vaccination](#)
- [Number of people vaccinated in Canada](#)
- [Number of COVID-19 vaccine doses administered in Canada](#)
- [Vaccines distributed in Canada](#)

## COVID-19 and mental health

- [Mental Illness during the Pandemic: Survey on COVID-19 and Mental Health \(Cycles 1 and 2\)](#)
- [Map of Canadian mental health during the COVID-19 pandemic](#)
- [Inequalities in the mental health of adults before and during the COVID-19 pandemic](#)

## Impacts of COVID-19

- [Frequency and impact of longer-term symptoms following COVID-19 in Canadian adults](#)
- [Impacts of the COVID-19 Pandemic on Canadian Children with Cognitive, Behavioural or Emotional Disabilities](#)

## COVID-19 inequalities

- [Social inequalities in COVID-19 deaths in Canada](#)

# Provincial, territorial and international reporting

For more information, please refer to provincial or territorial COVID-19 webpages:

- [British Columbia](#)
- [Alberta](#)
- [Saskatchewan](#)
- [Manitoba](#)
- [Ontario](#)
- [Quebec](#)
- [Newfoundland and Labrador](#)
- [New Brunswick](#)
- [Nova Scotia](#)
- [Prince Edward Island](#)
- [Yukon](#)
- [Northwest Territories](#)
- [Nunavut](#)

For more information, please refer to international COVID-19 webpages:

- [World Health Organization](#)
- [US Centers for Disease Control and Prevention](#)
- [European Centre for Disease Control and Prevention](#)

# Latest COVID-19 numbers (Last data update December 23, 2022, 10 am ET)

Weekly change in cases

**17,345**

Total cases

**4,475,268**

Weekly change in deaths

**227**

Total deaths

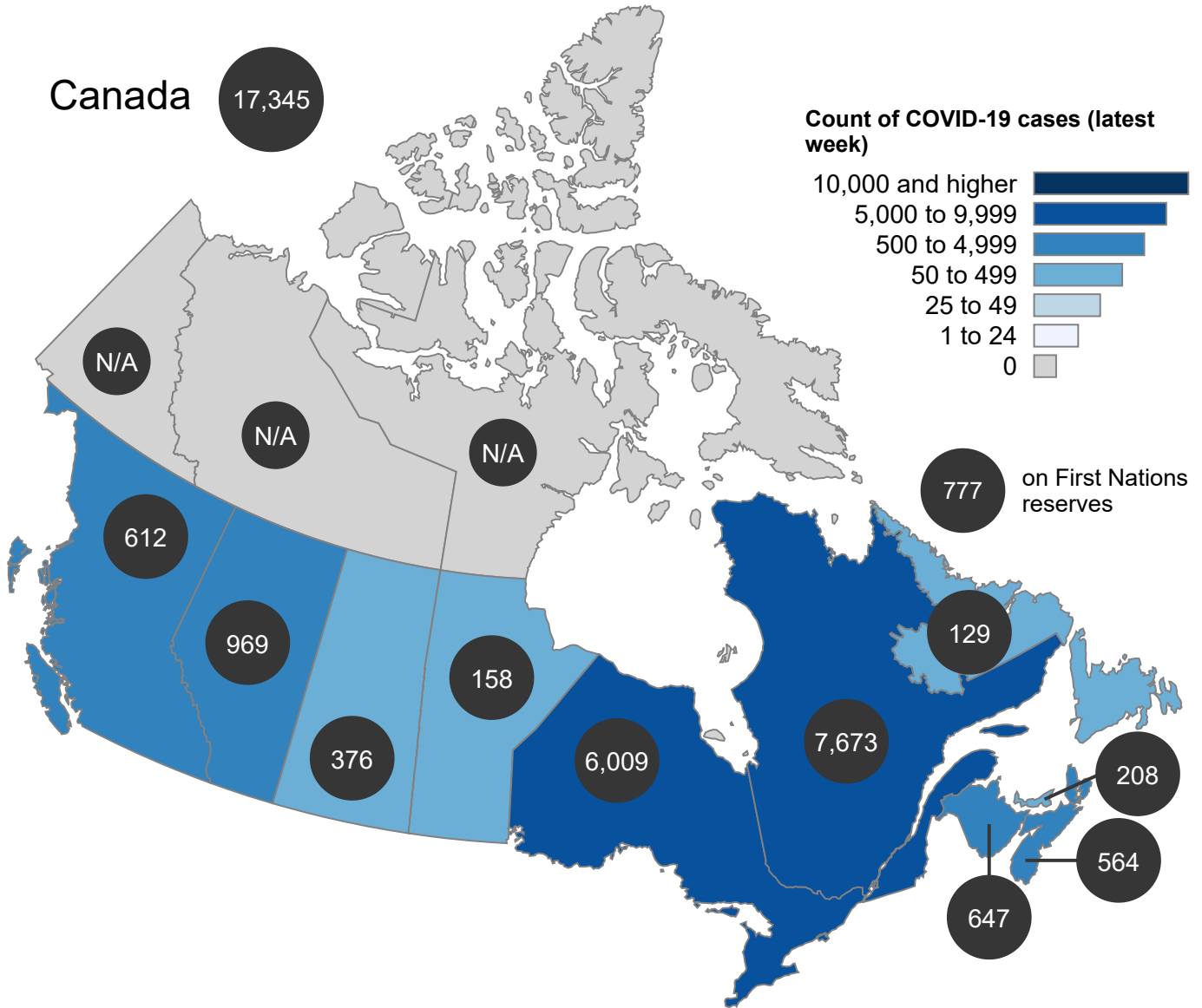
**48,948**

- Case and death information are up to December 17, 2022.
- Weekly change in cases and deaths includes data from 10 of the 13 Canadian provinces and territories reporting updates for the week of December 11 to December 17, 2022.
- These reflect the changes in the case and death counts at the end of the week compared to the end of the previous week.
- Due to changes in COVID-19 testing policies in many jurisdictions since December 2021, case counts are under-estimated.
- As of October 19, 2022, the Statistics Canada population estimates as of July 1, 2022 are being used for denominators in rate calculations.

# National and regional trends

Figure 1.  of  of COVID-19,  for the week of December 11 to December 17, 2022

(Last data update December 23, 2022, 10 am ET)



The count of cases of COVID-19 for the week of December 11 to December 17, 2022 in **Canada** was **17,345**.

- a. This information is based on data our provincial and territorial partners published on cases and deaths. The numbers provided reflect cases, deaths up to up to December 17, 2022. For the most up to date data for any province, territory or city, please visit their [website](#). The number of cases or deaths reported may differ slightly from those on the provincial and territorial websites as these websites may update historic case and death counts as new information becomes available.

- b. Due to changes in COVID-19 testing policies in many jurisdictions since December 2021, case counts are under-estimated.
- c. As of April 11, 2022, Nunavut no longer publishes regular COVID-19 updates.
- d. As of June 13, 2022, Northwest Territories no longer publishes regular COVID-19 updates.
- e. Due to technical issues, Ontario was not able to provide daily case or death updates for October 15-17. To estimate cases and deaths for October 9-15, we subtracted the cumulative total from October 14 from the cumulative total from October 18, 2022 and calculated the average increase per day for the missing days missing days (e.g. October 15-17, 2022). This average increase was added to the cumulative total on October 14, 2022 to calculate the estimated number of cases and deaths for October 15, 2022.
- f. As of November 16, 2022, Yukon no longer publishes regular COVID-19 updates.

**Areas in Canada with cases of COVID-19**

Location	Total cases		Cases (latest week)		Cases (latest 2 weeks)		Total deaths		Deaths (latest week)		Deaths (latest 2 weeks)	
	Count	Rate*	Count	Rate*	Count	Rate*	Count	Rate*	Count	Rate*	Count	Rate*
British Columbia	391,897	7,367	612	12	1,271	24	4,806	90	46	0.9	91	1.7
Alberta	622,242	13,696	969	21	2,015	44	5,348	118	18	0.4	40	0.9
Saskatchewan	150,942	12,633	376	31	803	67	1,781	149	5	0.4	21	1.8
Manitoba	153,507	10,893	158	11	313	22	2,331	165	26	1.8	30	2.1
Ontario	1,536,016	10,166	6,009	40	11,606	77	15,470	102	63	0.4	169	1.1
Quebec	1,272,013	14,628	7,673	88	15,018	173	17,472	201	53	0.6	124	1.4
Newfoundland and Labrador	53,914	10,250	129	25	279	53	288	55	6	1.1	9	1.7
New Brunswick	84,891	10,454	647	80	1,466	181	635	78	7	0.9	14	1.7
Nova Scotia	134,483	13,188	564	55	1,078	106	674	66	2	0.2	8	0.8
Prince Edward Island	55,319	32,409	208	122	449	263	82	48	1	0.6	1	0.6
Yukon	4,989	11,393	N/A	N/A	N/A	N/A	32	73	N/A	N/A	N/A	N/A
Northwest Territories	11,511	25,241	N/A	N/A	N/A	N/A	22	48	N/A	N/A	N/A	N/A
Nunavut	3,531	8,713	N/A	N/A	N/A	N/A	7	17	N/A	N/A	N/A	N/A
<b>Canada</b>	<b>4,475,268</b>	<b>11,496</b>	<b>17,345</b>	<b>45</b>	<b>34,298</b>	<b>88</b>	<b>48,948</b>	<b>126</b>	<b>227</b>	<b>0.6</b>	<b>507</b>	<b>1.3</b>

a. \* Rate per 100,000 population

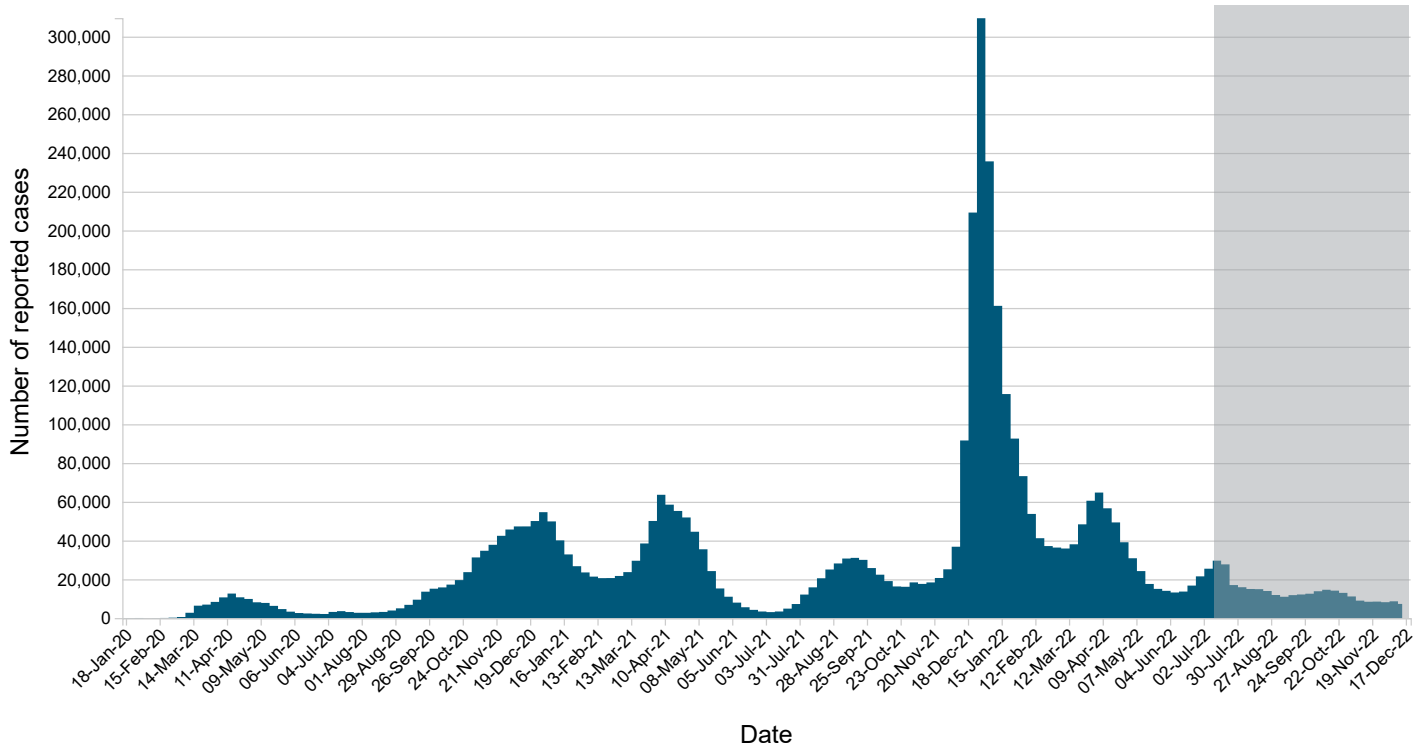
## Epidemic curve

As of December 23, 2022, 9 am ET, PHAC has received detailed case report data on 4,233,197 cases.

The shaded area for Figures 2 and 3 represents a period of accumulating data where it is known or expected that cases, and severe outcomes have occurred but have not yet been reported nationally. We update this information as it becomes available.

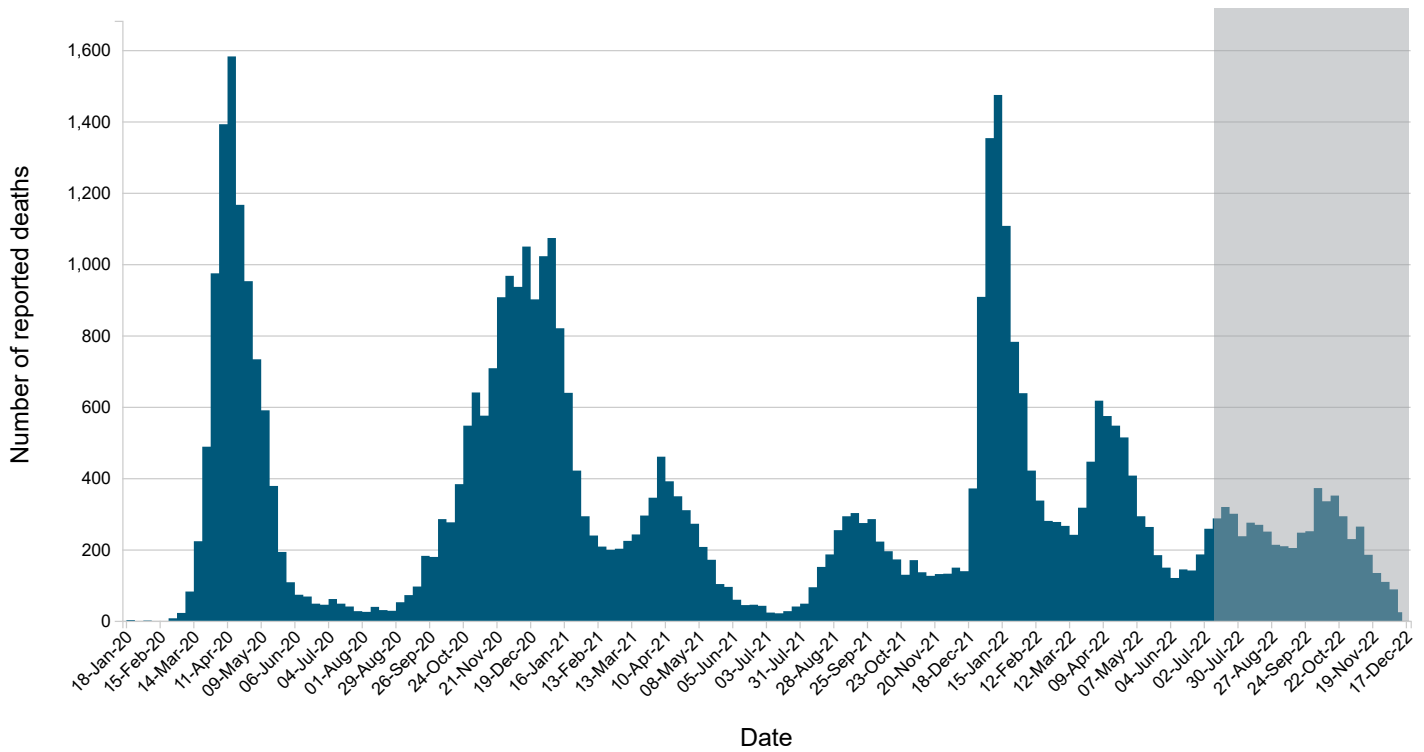
Due to changes in COVID-19 testing policies in many jurisdictions since December 2021, case counts are under-estimated.

**Figure 2a. COVID-19 cases (n=4,232,514) in Canada by date as of December 23, 2022, 9 am ET (total cases)**





**Figure 2b. COVID-19 cases (n=) in Canada by date as of December 23, 2022, 9 am ET (total deaths)**



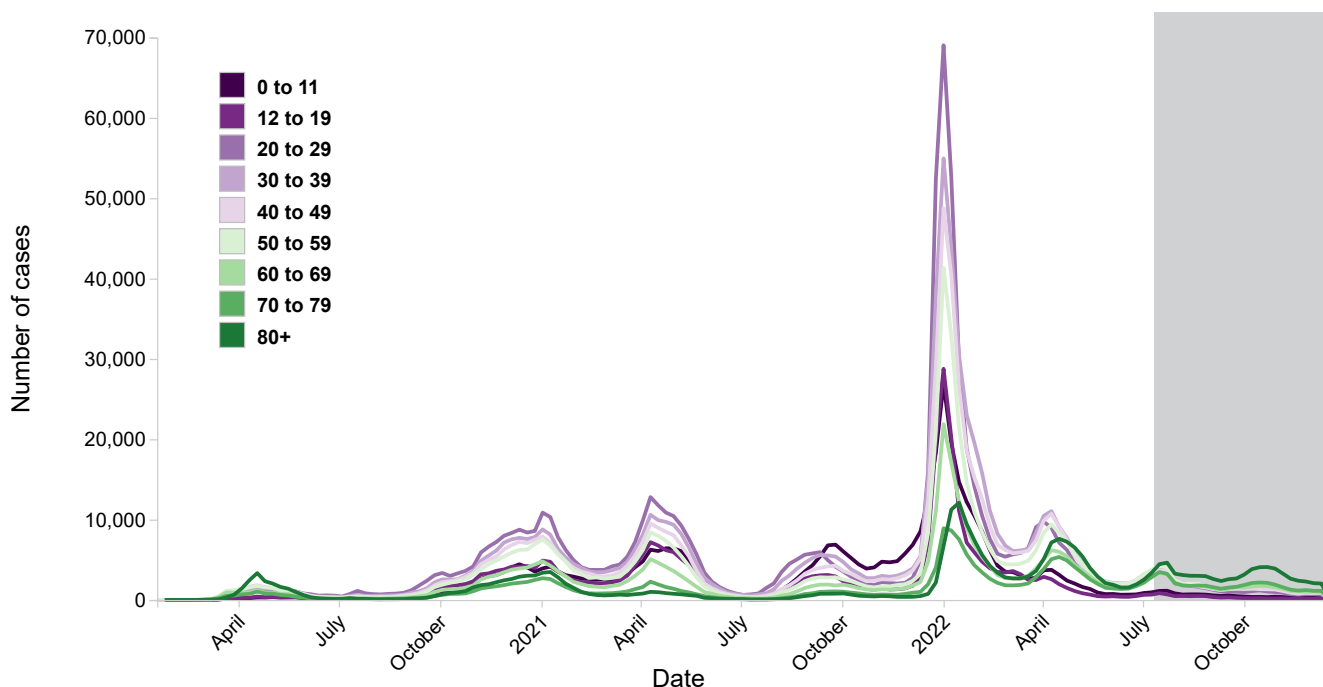
- a. This figure reflects detailed case information provided to the Public Health Agency of Canada (PHAC) by health authorities in the provinces and territories. This data is updated every week. It may change as we get more information about cases.
- b. The earliest of the following dates were used to determine the week in which a case or death is presented: Onset date, Specimen Collection Date, Laboratory Testing Date, Date Reported to Province or Territory, or Date Reported to PHAC.

# Cases by age and gender

We have detailed case report data from 4,233,197 cases. We know the age of patients in 99.9% of cases, and both age and gender in 99.7% of cases.

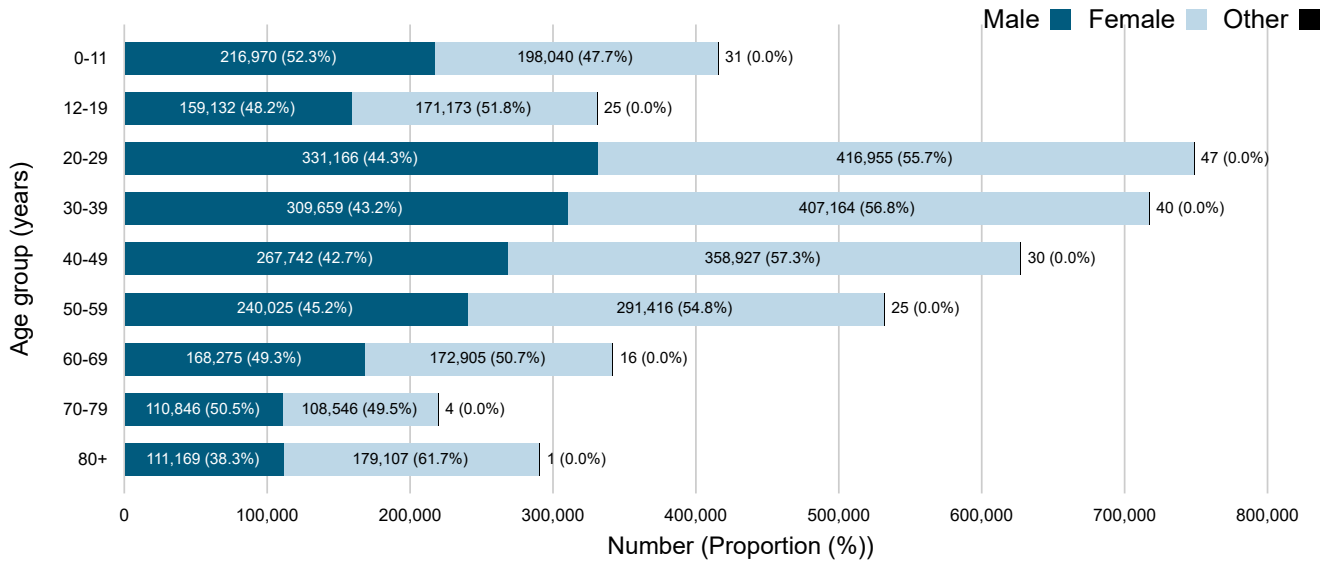
Of the cases reported in Canada so far, 54.6% were female and 34.7% were between 20 and 39 years old (Figure 3).

**Figure 3. Weekly number of COVID-19 cases by age group in Canada as of December 17, 2022**

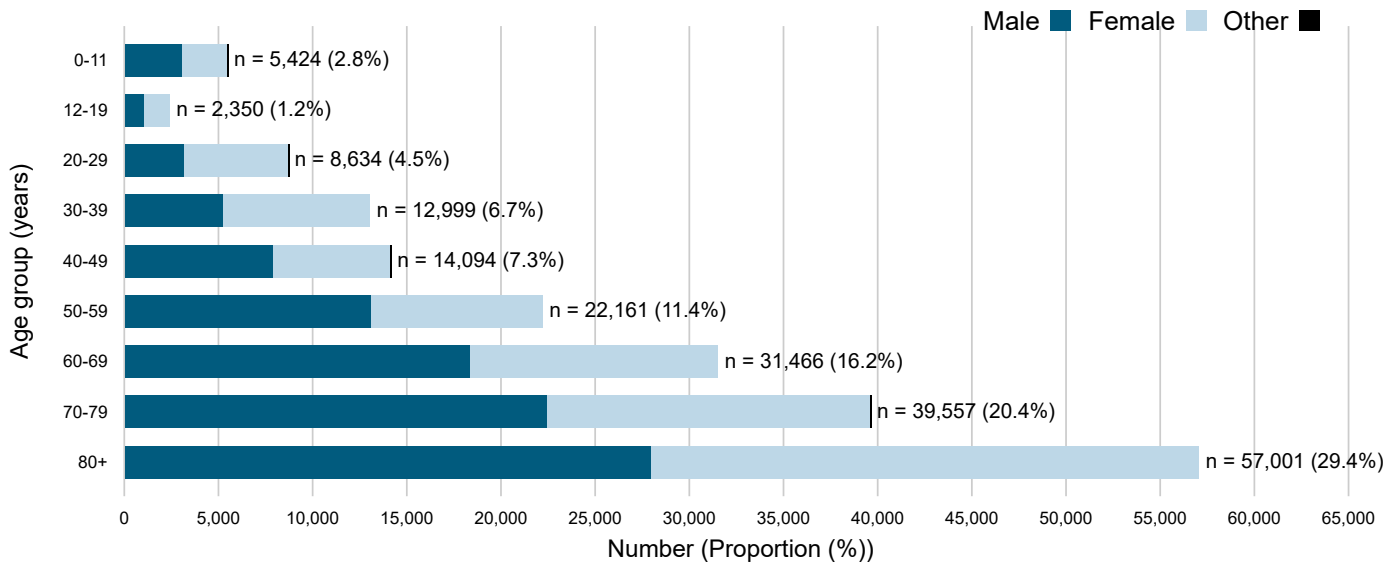


- This figure reflects detailed case information provided to the Public Health Agency of Canada (PHAC) by health authorities in the provinces and territories. This data is updated every week. It may change as we get more information about cases.
- The earliest of the following dates were used to determine the week in which a case or death is presented: Onset date, Specimen Collection Date, Laboratory Testing Date, Date Reported to Province or Territory, or Date Reported to PHAC.
- Due to changes in COVID-19 testing policies in many jurisdictions since December 2021, case counts are under-estimated
- As of October 19, 2022, the Statistics Canada population estimates as of July 1, 2022 are being used for denominators in rate calculations.

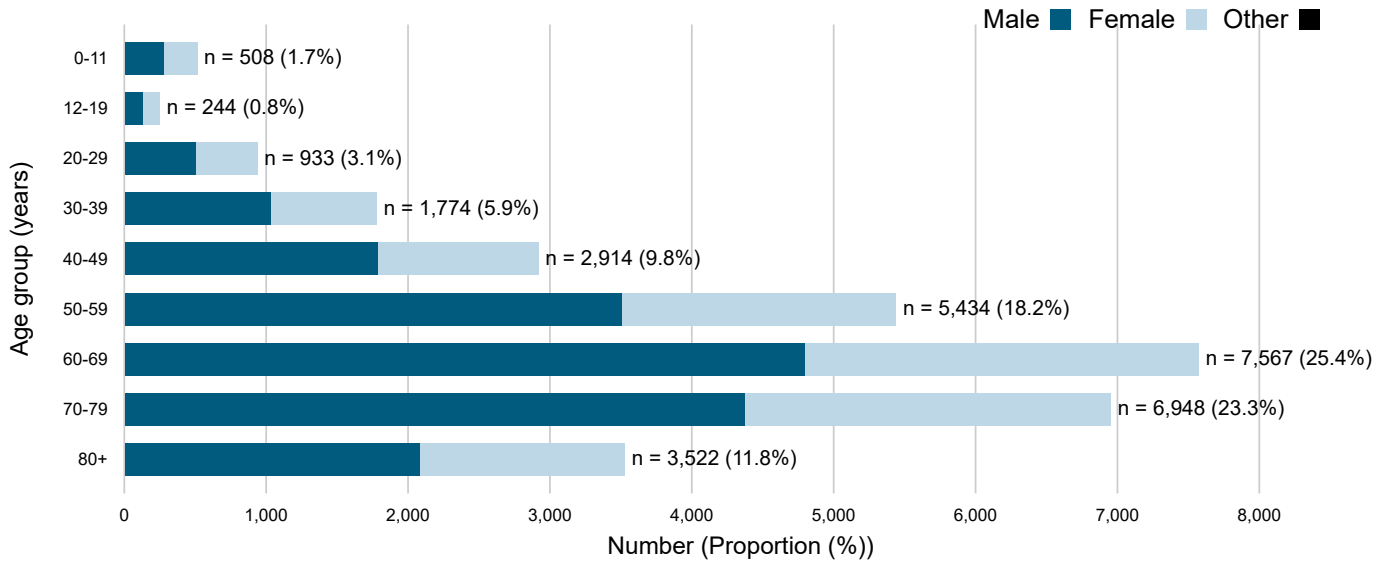
**Figure 4a. Age and gender distribution of COVID-19 cases in Canada as of December 23, 2022, 9 am ET (n=4,093,695)**



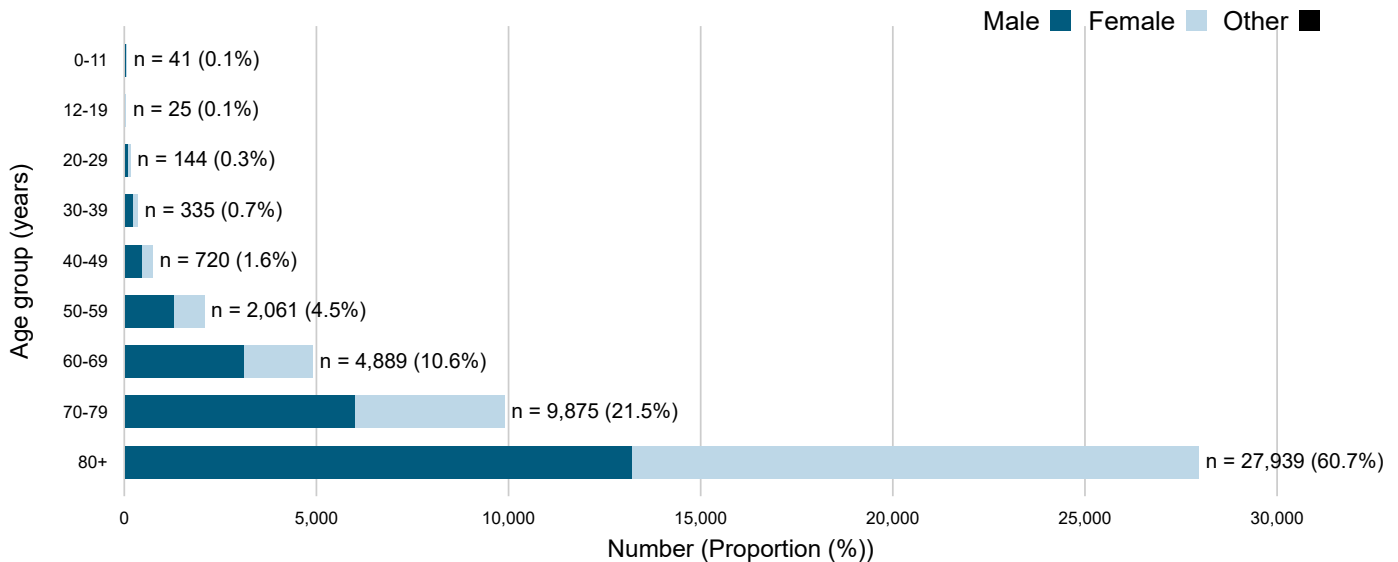
**Figure 4b. Age and gender distribution of COVID-19 cases hospitalized in Canada as of December 23, 2022, 9 am ET (n=193,686)**



**Figure 4c. Age and gender distribution of COVID-19 cases admitted to ICU in Canada as of December 23, 2022, 9 am ET (n=29,844)**



**Figure 4d. Age and gender distribution of COVID-19 cases deceased in Canada as of December 23, 2022, 9 am ET (n=46,029)**



- a. This figure reflects detailed case information provided to the Public Health Agency of Canada (PHAC) by health authorities in the provinces and territories. This data is updated every week. It may change as we get more information about cases.
- b. This figure includes COVID-19 cases hospitalized, admitted to ICU, and deceased for which age and gender information were available. Therefore, some COVID-19 hospitalizations, ICU admissions, and deaths may not be included.

**Age and gender distribution of COVID-19 cases in Canada as of December 23, 2022, 9 am ET (n=4,093,695)**

<b>Age group (years)</b>	<b>Number of cases with case reports (percentage)</b>	<b>Number of male cases (percentage)</b>	<b>Number of female cases (percentage)</b>	<b>Number of other cases (percentage)</b>
0-11	416,752 (9.8%)	216,970 (11.3%)	198,040 (8.6%)	31 (14.2%)
12-19	331,769 (7.8%)	159,132 (8.3%)	171,173 (7.4%)	25 (11.4%)
20-29	751,272 (17.8%)	331,166 (17.3%)	416,955 (18.1%)	47 (21.5%)
30-39	718,916 (17.0%)	309,659 (16.2%)	407,164 (17.7%)	40 (18.3%)
40-49	628,262 (14.8%)	267,742 (14.0%)	358,927 (15.6%)	30 (13.7%)
50-59	532,724 (12.6%)	240,025 (12.5%)	291,416 (12.6%)	25 (11.4%)
60-69	341,985 (8.1%)	168,275 (8.8%)	172,905 (7.5%)	16 (7.3%)
70-79	219,810 (5.2%)	110,846 (5.8%)	108,546 (4.7%)	4 (1.8%)
80+	290,757 (6.9%)	111,169 (5.8%)	179,107 (7.8%)	1 (0.5%)

**Age and gender distribution of COVID-19 cases hospitalized in Canada as of December 23, 2022, 9 am ET (n=193,686)**

<b>Age group (years)</b>	<b>Number of cases with case reports (percentage)</b>	<b>Number of male cases (percentage)</b>	<b>Number of female cases (percentage)</b>	<b>Number of other cases (percentage)</b>
0-11	5,424 (2.8%)	3,038 (1.6%)	2,385 (1.2%)	1 (0.0%)
12-19	2,350 (1.2%)	988 (0.5%)	1,362 (0.7%)	0 (0.0%)
20-29	8,634 (4.5%)	3,143 (1.6%)	5,490 (2.8%)	1 (0.0%)
30-39	12,999 (6.7%)	5,220 (2.7%)	7,779 (4.0%)	0 (0.0%)
40-49	14,094 (7.3%)	7,832 (4.0%)	6,261 (3.2%)	1 (0.0%)
50-59	22,161 (11.4%)	13,073 (6.7%)	9,088 (4.7%)	0 (0.0%)
60-69	31,466 (16.2%)	18,346 (9.5%)	13,120 (6.8%)	0 (0.0%)
70-79	39,557 (20.4%)	22,398 (11.6%)	17,158 (8.9%)	1 (0.0%)
80+	57,001 (29.4%)	27,929 (14.4%)	29,072 (15.0%)	0 (0.0%)

**Age and gender distribution of COVID-19 cases admitted to ICU in Canada as of December 23, 2022, 9 am ET (n=29,844)**

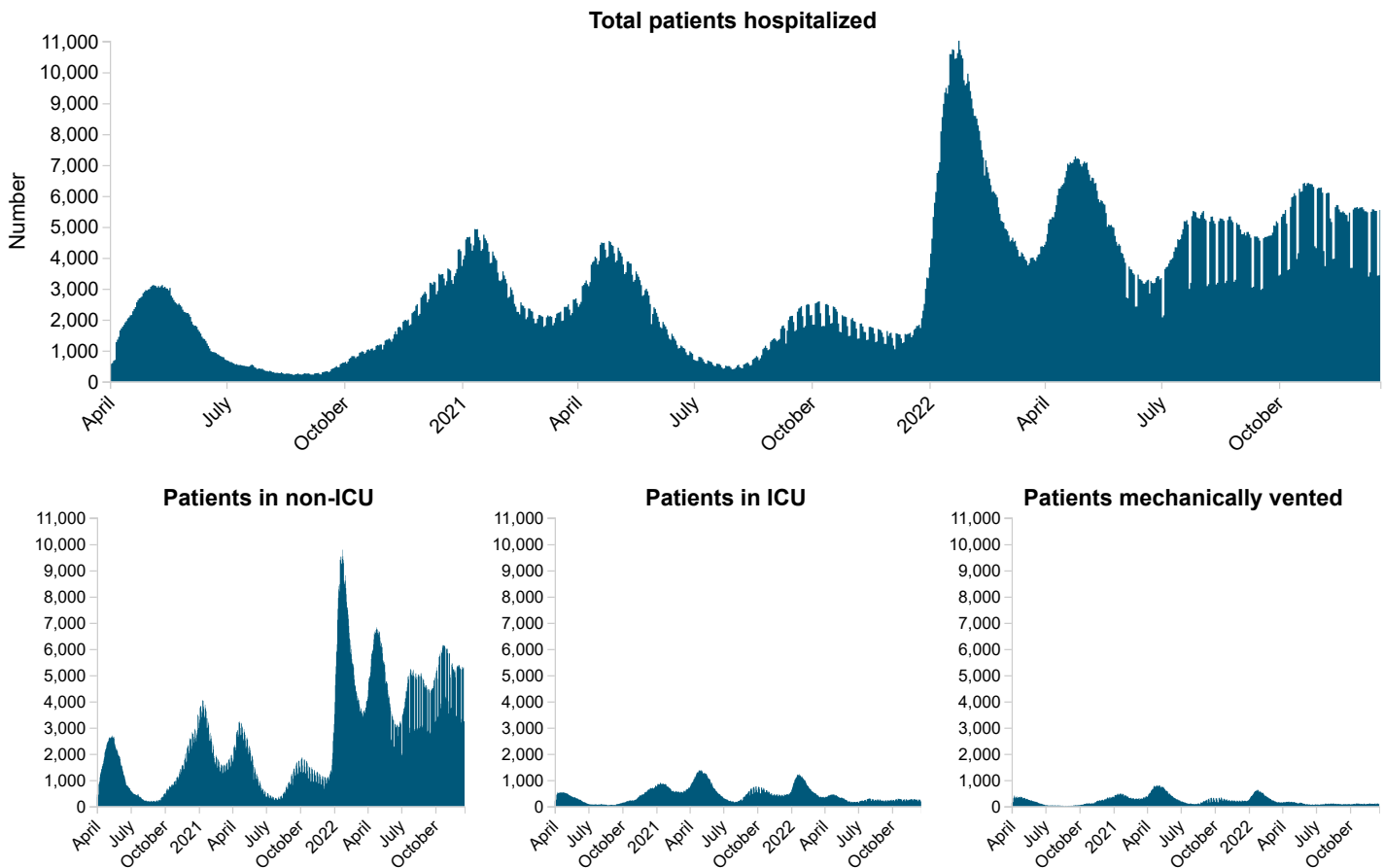
<b>Age group (years)</b>	<b>Number of cases with case reports (percentage)</b>	<b>Number of male cases (percentage)</b>	<b>Number of female cases (percentage)</b>	<b>Number of other cases (percentage)</b>
0-11	508 (1.7%)	274 (0.9%)	234 (0.8%)	0 (0.0%)
12-19	244 (0.8%)	126 (0.4%)	118 (0.4%)	0 (0.0%)
20-29	933 (3.1%)	502 (1.7%)	431 (1.4%)	0 (0.0%)
30-39	1,774 (5.9%)	1,030 (3.5%)	744 (2.5%)	0 (0.0%)
40-49	2,914 (9.8%)	1,784 (6.0%)	1,130 (3.8%)	0 (0.0%)
50-59	5,434 (18.2%)	3,507 (11.8%)	1,927 (6.5%)	0 (0.0%)
60-69	7,567 (25.4%)	4,794 (16.1%)	2,773 (9.3%)	0 (0.0%)
70-79	6,948 (23.3%)	4,375 (14.7%)	2,573 (8.6%)	0 (0.0%)
80+	3,522 (11.8%)	2,083 (7.0%)	1,439 (4.8%)	0 (0.0%)

**Age and gender distribution of COVID-19 cases deceased in Canada as of December 23, 2022, 9 am ET (n=46,029)**

<b>Age group (years)</b>	<b>Number of cases with case reports (percentage)</b>	<b>Number of male cases (percentage)</b>	<b>Number of female cases (percentage)</b>	<b>Number of other cases (percentage)</b>
0-11	41 (0.1%)	20 (0.0%)	21 (0.0%)	0 (0.0%)
12-19	25 (0.1%)	13 (0.0%)	12 (0.0%)	0 (0.0%)
20-29	144 (0.3%)	89 (0.2%)	55 (0.1%)	0 (0.0%)
30-39	335 (0.7%)	208 (0.5%)	127 (0.3%)	0 (0.0%)
40-49	720 (1.6%)	453 (1.0%)	267 (0.6%)	0 (0.0%)
50-59	2,061 (4.5%)	1,266 (2.8%)	795 (1.7%)	0 (0.0%)
60-69	4,889 (10.6%)	3,095 (6.7%)	1,794 (3.9%)	0 (0.0%)
70-79	9,875 (21.5%)	5,997 (13.0%)	3,878 (8.4%)	0 (0.0%)
80+	27,939 (60.7%)	13,197 (28.7%)	14,742 (32.0%)	0 (0.00%)

# Hospital use

Figure 5. Daily number of hospital beds and ICU beds occupied by COVID-19 patients as of December 19, 2022



Between December 12, 2022 and December 19, 2022:

- the total number of **hospital beds** occupied by COVID-19 patients **increased** from **5,488** to **5,548** beds.
- the number of **non-ICU beds** occupied by COVID-19 patients **increased** from **5,228** to **5,300** beds.
- the number of **ICU beds** occupied by COVID-19 patients **decreased** from **260** to **248** beds.
- the number of **COVID-19 patients who were mechanically vented** **increased** from **100** to **104**.

# COVID-19 epidemiology update: Cases following vaccination

Last updated: 2022-12-23

 PDF

Summary of COVID-19 cases, hospitalizations and deaths, cases following vaccination, testing and variants of concern across Canada and over time. Older versions of this report are available on the [archived reports page](#).

## Cases following vaccination

**Note:** We are in the process of improving this page. Regular data updates will resume in the coming weeks. Data extracted on October 14, 2022 for cases between December 14, 2020 and September 25, 2022.

While COVID-19 vaccines are highly effective at preventing severe outcomes such as hospitalization and death, vaccinated people can still get infected if exposed. This means that even with high vaccine effectiveness, some vaccinated people will get sick, be hospitalized or die.

Most people in Canada have been vaccinated. Because they're a larger group, there will naturally be more cases among vaccinated people than among unvaccinated people. However, despite their higher case counts, **vaccinated people are less likely to get very sick or die.**

Case counts underestimate the total number of COVID-19 cases because a rapid increase in cases starting in December 2021 led to changes in COVID-19 testing policies and delays in data entry.

Case counts are likely to over-represent people at risk of severe disease, because they have been prioritized for testing. Data should be interpreted with caution.

### Cases reported since the start of the vaccination campaign, as of September 25, 2022

Since the start of the vaccination campaign on December 14, 2020, PHAC received case-level vaccine history data for 73% (n=2,457,576) of COVID-19 cases aged 5 years or older.

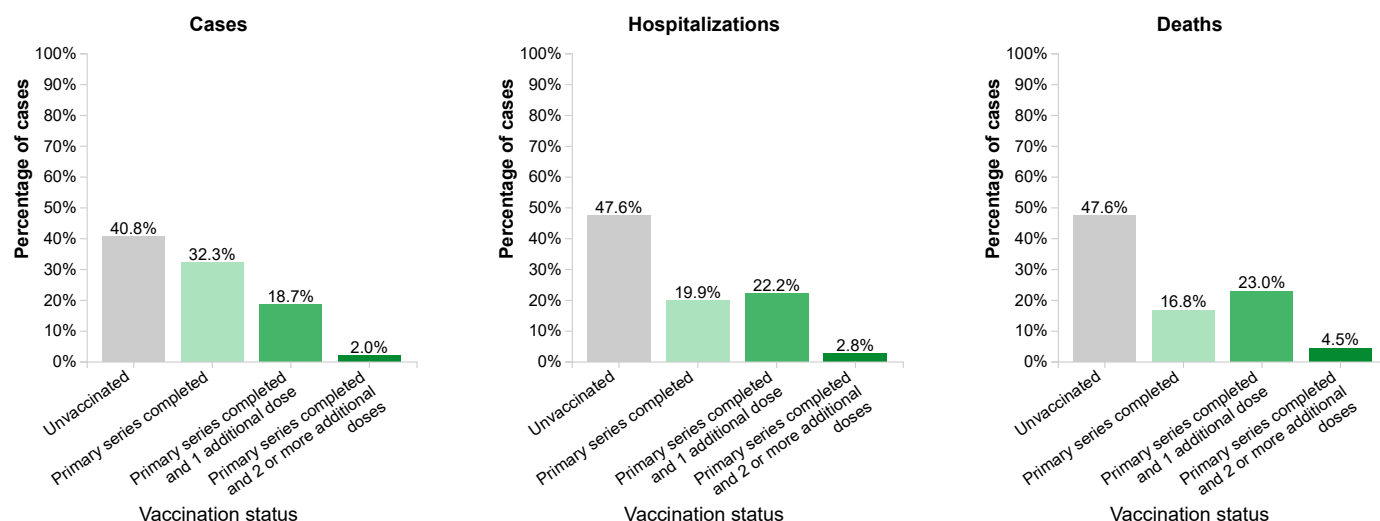
Of these cases:

- 1,002,452 (40.8%) were unvaccinated
- 794,145 (32.3%) had completed their primary vaccine series
- 460,280 (18.7%) had completed their primary vaccine series and 1 additional dose
- 49,056 (2.0%) had completed their primary vaccine series and 2 or more additional doses

For definitions of the different vaccination statuses, please refer to the [Technical notes and definitions section](#).



**Figure 1. Distribution of outcomes of confirmed COVID-19 cases reported to PHAC by vaccination status as of September 25, 2022**



**Outcomes of confirmed COVID-19 cases reported to PHAC by vaccination status, as of September 25, 2022**

Status	Cases	Hospitalizations	Deaths
Unvaccinated	40.8%	47.6%	47.6%
Primary series completed	32.3%	19.9%	16.8%
Primary series completed and 1 additional dose	18.7%	22.2%	23.0%
Primary series completed and 2 or more additional doses	2.0%	2.8%	4.5%

Among the twelve jurisdictions that have reported case-level vaccine history data to PHAC, a total of 25.2 million people have received at least one dose of the COVID-19 vaccine as of September 25, 2022.

Cases following vaccination were more common among older adults and females (Table 1). This may be due to:

- higher risk of disease among older adults and pregnant people
- longer life expectancy among females, which means more women move into older age groups with a higher risk of disease

Older adults have been prioritized for second booster doses. As a result, older people make up a large proportion of people who had completed their primary vaccine series and 2 or more additional doses. For the same reason, they also make up a large proportion of cases in that group.

**Table 1. Characteristics of confirmed cases by vaccination status, as of September 25, 2022**

		<b>Unvaccinated</b> (n=1,002,452)	<b>Primary series completed</b> (n=794,145)	<b>Primary series completed and 1 additional dose</b> (n=460,280)	<b>Primary series completed and 2 or more additional doses</b> (n=49,056)	<b>Total cases†</b> (n=2,457,576)
<b>Gender*</b>	Male	505,488 (45.3%)	349,204 (31.3%)	168,004 (15.0%)	19,728 (1.8%)	1,116,527 (100.0%)
	Female	492,450 (36.9%)	442,709 (33.2%)	291,150 (21.8%)	29,222 (2.2%)	1,332,782 (100.0%)
<b>Age group</b>	5-11	124,188 (75.3%)	8,334 (5.1%)	26 (0.0%)	0 (0.0%)	164,844 (100.0%)
	12-17	72,638 (52.9%)	56,193 (40.9%)	2,534 (1.9%)	14 (0.0%)	137,288 (100.0%)
	18-39	422,270 (43.2%)	375,031 (38.4%)	132,168 (13.5%)	1,587 (0.2%)	978,009 (100.0%)
	40-59	251,264 (36.3%)	246,720 (35.6%)	153,871 (22.2%)	4,104 (0.6%)	692,037 (100.0%)
	60-79	103,393 (31.2%)	85,657 (25.8%)	101,450 (30.6%)	18,218 (5.5%)	331,631 (100.0%)
	80+	28,699 (18.7%)	22,210 (14.4%)	70,231 (45.7%)	25,133 (16.3%)	153,767 (100.0%)

**Source:** Detailed case information received by PHAC from provinces and territories, since December 14, 2020 (see data notes in the [Technical notes and definitions section](#))

**People who were diagnosed with COVID-19 after completing their primary vaccine series were significantly less likely to be hospitalized or to die, particularly if they received an additional dose(s).**

Between August 29, 2022 and September 25, 2022, unvaccinated cases were 3 times more likely to be hospitalized and 5 times more likely to die from their illness, compared to cases with a completed primary vaccine series. During the same 4-week period, unvaccinated cases were 3 times more likely to be hospitalized and 5 times more likely to die from their illness, compared to cases with a completed primary vaccine series and 1 or more additional doses ([see data notes in Technical notes and definitions section](#)).

### Technical notes and definitions

Data for this analysis comes from the COVID-19 national data set, which contains detailed case-level information received by PHAC from all provinces and territories.

- 12 of 13 provinces and territories have reported case-level vaccine history data to PHAC as part of the national COVID-19 dataset.
  - 12 of these provinces and territories reported data on cases with a completed primary vaccine series and 1 additional dose. 8 of the 12 provinces and territories reported data on cases with a completed primary vaccine series and 2 or more additional doses. In provinces and territories that have not yet reported additional dose data, cases are classified as having completed their primary vaccine series if they have a completed primary series or with or without any more additional doses.
  - We used a data cut-off of September 25, 2022 to account for routine reporting delays associated with vaccine history information.
  - †Counts of cases by vaccination status may not add up to total counts, as data on cases not yet protected and partially vaccinated cases are not presented here.
  - Data presented here on cases with a completed primary vaccine series and 1 or more additional dose(s) are limited to individuals aged 5 years or older.
  - \*When available, we used gender data. If unavailable, we used sex data. We excluded cases with missing gender and sex data from the gender analysis. Reliable data on gender diverse respondents are unavailable due to small counts.
- 
- As of October 18, 2022, rate ratios are age-standardized using July 2022 Canadian population estimates for all 2022 report weeks. As a result, there is a decrease in rate ratios compared to previously published reports. For more information on denominators for cases following vaccination, see [Vaccination coverage data sources](#).
  - For analyses of rate ratios, cases are classified as having completed their primary series with one or more additional dose(s) if they have received at least 1 additional dose after completing their primary series
  - Rate ratio calculations were based on data from 12 provinces and territories that have reported complete case-level vaccine history data to PHAC during the 4-week period of analysis.

**Episode date:** Refers to symptom onset date. When symptom onset date is unavailable or the case is asymptomatic, episode date refers to either:

- laboratory specimen collection date, or
- laboratory testing date

PHAC monitors cases following vaccination using the following categories:

**Unvaccinated cases:** those who were unvaccinated at the time of their episode date.

**Cases not yet protected from vaccination:** those whose episode date occurred less than 14 days after their first dose of the vaccine.

**Partially vaccinated cases:** those whose episode date occurred:

- 14 days or more after their first vaccine dose in a 2-dose series, or
- less than 14 days after their second dose of the vaccine.

**Cases with a completed primary series:** those whose episode date occurred:

- 14 days or more after receipt of a second dose in a 2-dose series, or
- 14 days or more after receipt of one dose of a 1-dose vaccine series, and
- if an additional (for example, third dose or booster) dose was received, 0 to <14 days after receipt of the first additional dose.

**Cases with a completed primary series and 1 or more additional dose(s):** those whose episode date occurred 14 days or more following the receipt of at least 1 additional dose (for example, third dose or booster) of a COVID-19 vaccine product, after completing a primary vaccine series.

- Data on counts and distributions are further categorized into 2 groups:
  - **Cases with a completed primary vaccine series and 1 additional dose:** those whose episode date occurred 14 days or more following receipt of 1 additional dose (for example, third dose or first booster) of a COVID-19 vaccine product and, if a second additional dose was received, 0 to <14 days after receipt of that dose
  - **Cases with a completed primary series and 2 or more additional doses:** those whose episode date occurred 14 days or more following receipt of at least 2 additional doses (for example, fourth dose or second booster)

**COVID-19 vaccine product:** vaccines that have been:

- authorized by Health Canada or
- accepted by the Government of Canada for the purpose of travel to and within Canada

# COVID-19 epidemiology update: Testing and variants

Last updated: 2022-12-23



Summary of COVID-19 cases, hospitalizations and deaths, cases following vaccination, testing and variants of concern across Canada and over time. Older versions of this report are available on the [archived reports page](#).

## Testing and variants

**Update schedule:** We update 'Key COVID-19 testing updates' and 'Testing in Canada' every Monday. We update 'COVID-19 variants in Canada' every Friday. This page was last updated on December 23, 2022, 10 am ET.

### Changes to COVID-19 testing data source

The data source for COVID-19 testing in Canada changed on December 5, 2022. We have changed surveillance systems for monitoring laboratory testing of SARS-CoV-2, the virus that causes COVID-19. We now use the Respiratory Virus Detection Surveillance System (RVDSS). Before December 5, we used the System for Analyzing Laboratory Test counts (SALT) (see [Data notes](#)).

## Key COVID-19 testing updates (Last data update December 23, 2022, 10 am ET)

Weekly tests reported

**80,681**

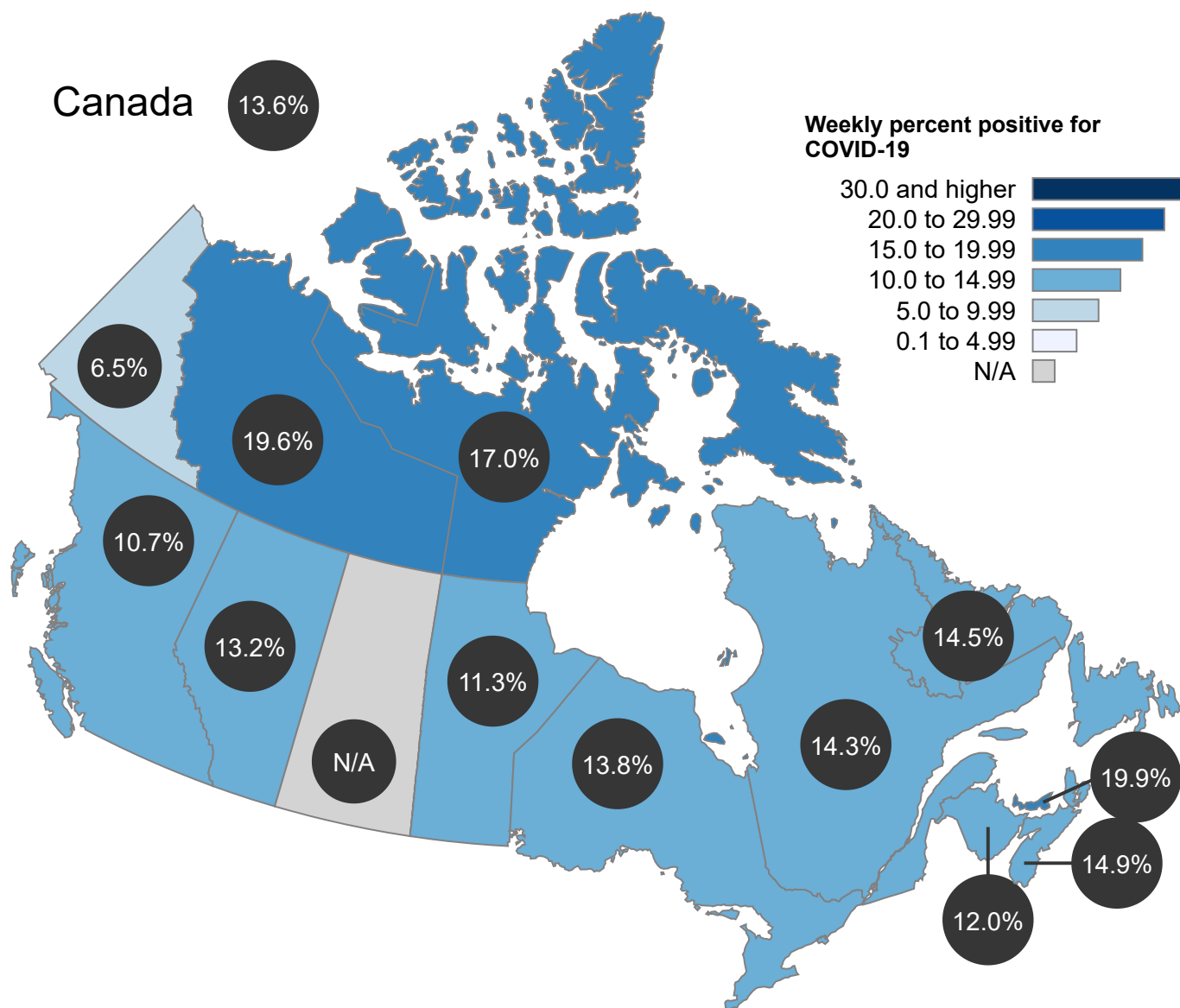
Weekly percent positivity

**13.6%**

- Laboratory testing information is based on data from the Respiratory Virus Detection Surveillance System (RVDSS) (see [Data notes](#)).
- Weekly percent positivity is calculated as the number of positive tests divided by the total number of tests performed during the epidemiological week.
- Laboratory data represents specimens received by labs up to December 17, 2022.
- Due to changes in COVID-19 testing policies in many jurisdictions since December 2021, case counts are under-estimated.

# Testing in Canada

Figure 1.  for COVID-19 by select laboratories, by province or territory up to December 17, 2022 (Last data update December 23, 2022, 10 am ET)



The percentage of weekly positive tests up to December 17, 2022 in **Canada** was **13.6%**.

- a. This information is based on testing data provided to the Public Health Agency of Canada (PHAC) by health authorities in the provinces and territories. The numbers provided reflect tests up to December 17, 2022. For the most up to date data for any province, territory or city, please visit their [website](#).
- b. Weekly percent positivity is calculated as the number of positive tests divided by the total number of tests performed during the epidemiological week.

c. Case counts are under-estimated due to changes in COVID-19 testing policies in many jurisdictions since December 2021.

d. The data represent surveillance data available through RVDSS up to December 17, 2022. N.A represents missing data. We update data retroactively when we receive delayed data reports.

#### Testing in Canada for COVID-19

Location	Weekly tests reported	Weekly percent positive
British Columbia	6,963	10.7%
Alberta	7,594	13.2%
Saskatchewan	0	N/A
Manitoba	2,219	11.3%
Ontario	17,508	13.8%
Quebec	34,275	14.3%
Newfoundland and Labrador	826	14.5%
New Brunswick	5,627	12.0%
Nova Scotia	4,395	14.9%
Prince Edward Island	933	19.9%
Yukon	123	6.5%
Northwest Territories	112	19.6%
Nunavut	106	17.0%
<b>Canada</b>	<b>80,681</b>	<b>13.6%</b>

On December 5, 2022, we changed surveillance systems for monitoring laboratory testing of SARS-CoV-2, the virus that causes COVID-19. We now use the Respiratory Virus Detection Surveillance System (RVDSS). Before December 5, we used the System for Analyzing Laboratory Test counts (SALT).

SALT was set up early in the COVID-19 pandemic to monitor daily SARS-CoV-2 testing volumes, and the percent of tests that were positive.

RVDSS is a longstanding surveillance system that collects data from laboratories across Canada on:

- the number of tests performed in participating laboratories and
- the number of positive tests for respiratory viruses

RVDSS mostly collects data from the tests of people who had COVID-19 symptoms or exposures, in order to assess trends in transmission via test positivity. RVDSS allows us to monitor COVID-19 in the context of other respiratory viruses.

The SALT and RVDSS data are not directly comparable.

- RVDSS data on COVID-19 is available starting the week of August 28, 2022 (Week 1 of the 2022/23 influenza season). SALT data are available starting February 1, 2020.
- Test positivity is higher in RVDSS than SALT. This is because tests reported to RVDSS are usually collected for clinical investigations, meaning people with symptoms or exposure to COVID-19, resulting in a higher proportion of positive tests.
- RVDSS presents all data by epidemiological week, while SALT presented daily data. [Historical SALT testing data is available](#).

The number of laboratories participating in RVDSS can vary week to week and across provinces and territories. As a result, the numbers of tests performed cannot be directly compared between provinces and territories. The number of tests reported may be used to add context to interpret weekly percent positivity.

For information on other respiratory viruses circulating in Canada, and comparisons with COVID-19, please visit the [weekly RVDSS report](#).



# COVID-19 variants in Canada

All viruses, including COVID-19, change over time. These changes are called mutations, and result in variants of the virus. Not all mutations are of concern. Most do not cause more severe illness. However, some mutations result in variants of concern or variants of interest.

A variant of concern has mutations that are significant to public health. Before a variant of interest is considered one of concern, scientists and public health professionals must determine if the mutations result in an actual change in the behaviour of the virus. For example, it might:

- spread more easily
- cause more severe illness
- require different treatments, or
- reduce vaccine effectiveness

The Public Health Agency of Canada (PHAC) works with provincial and territorial partners and the Canadian COVID-19 Genomics Network ([CanCOGeN](#)) to sequence a percentage of all positive COVID-19 test results. Sequencing reveals the genetic code of the virus, which tells us which variant is involved in a specific case of COVID-19. We report the proportion of COVID-19 variants in Canada every week.

We collect evidence to determine if new variants meet the definition for a variant of concern or a variant of interest. Many variants are being tracked across Canada and around the world.

Currently, Omicron and its sub-lineages are the primary variants of COVID-19 circulating in Canada. Evidence demonstrates that Omicron is more transmissible than previous variants of concern.

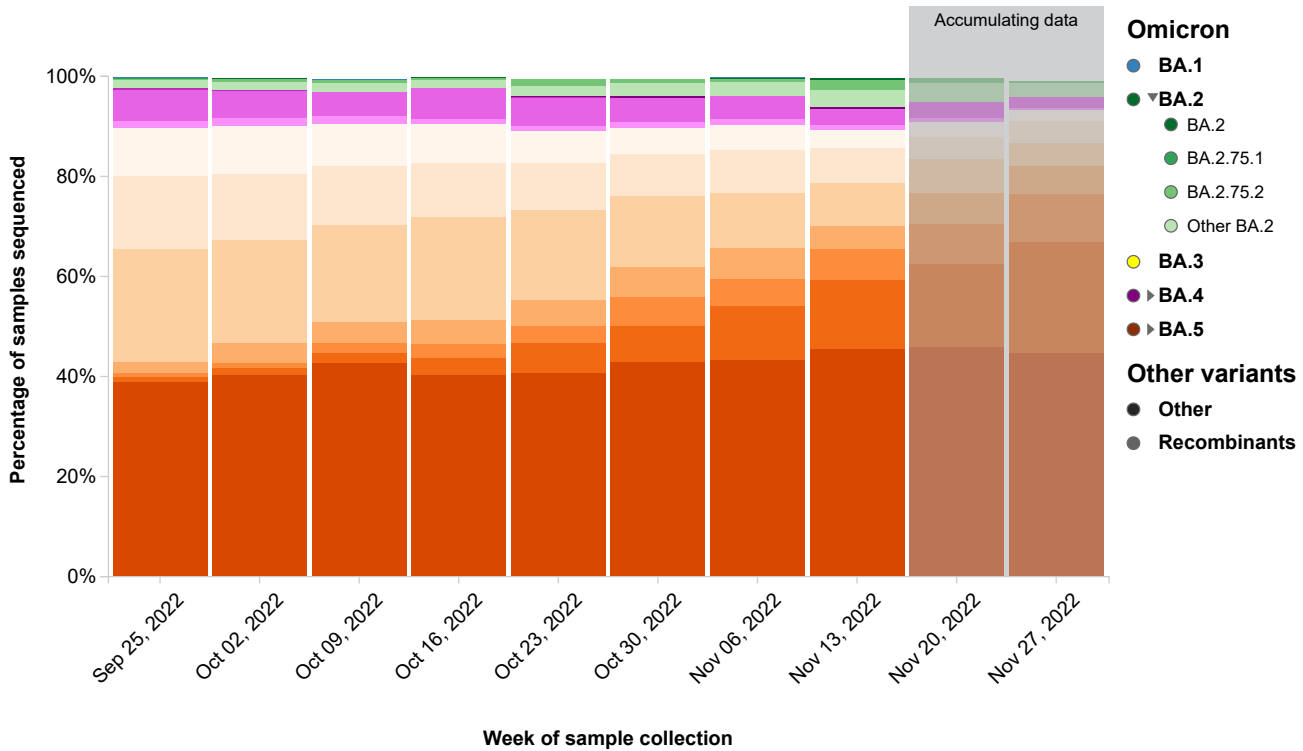
Previous variants of concern in Canada are as follows:

- Alpha
- Beta
- Gamma
- Delta

Staying up to date with COVID-19 vaccination continues to be one of the most effective ways to protect against serious illness, hospitalization, and death from COVID-19. Canada now has access to two updated bivalent vaccines that are expected to provide better protection against the Omicron variant of concern.

**Figure 2. Weekly variant breakdown** Updated: December 19, 2022, 4 pm EDT

**i** The graphic shows the percentage mix of COVID-19 variants detected in Canada through whole genome sequencing, by week of sample collection. You can see the numbers for each date by hovering over, tabbing to, or long-pressing any of the bars. To see a specific variant or variant grouping, click or press return. Repeat to restore the complete graph. Sublineages or offshoots for some variants can be revealed or hidden by clicking on the name of the variant in the legend.



This information is based on whole genome sequencing from surveillance testing in all provinces and territories. In addition to sequencing done by the National Microbiology Laboratory in Winnipeg, data is included from [provincial and territorial laboratories](#).

Sequencing takes from 1 to 3 weeks to complete, so the proportions for recent weeks may change as more data are added. Surveillance in each province or territory is organized and prioritized according to local needs and may change from time to time. Because of differences in local sampling and reporting, the percentages illustrate trends rather than precise measurements.

## Weekly variant breakdown

Percentage of COVID-19 cases identified through whole genome sequencing, presented by variant and by week of sample collection.

### Percentage of COVID-19 cases identified through whole genome sequencing, presented by variant and by week of sample collection.

Variant Grouping	Sep 25, 2022 (n=3,879)	Oct 02, 2022 (n=3,821)	Oct 09, 2022 (n=3,866)	Oct 16, 2022 (n=4,063)	Oct 23, 2022 (n=3,954)	Oct 30, 2022 (n=3,257)	Nov 06, 2022 (n=2,905)	Nov 13, 2022 (n=2,802)	Nov 20, 2022 (n=2,709)
<b>Omicron</b>	<b>99.7%</b>	<b>99.4%</b>	<b>99.3%</b>	<b>99.6%</b>	<b>99.2%</b>	<b>99.2%</b>	<b>99.6%</b>	<b>99.5%</b>	<b>99.4%</b>
<b>BA.1</b>	<b>0.1%</b>	<b>0.0%</b>	<b>0.1%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.0%</b>	<b>0.1%</b>	<b>0.0%</b>	-
<b>BA.2</b>	<b>2.0%</b>	<b>2.2%</b>	<b>2.4%</b>	<b>2.0%</b>	<b>3.2%</b>	<b>3.3%</b>	<b>3.5%</b>	<b>5.8%</b>	<b>4.7%</b>
BA.2	0.1%	0.1%	0.1%	0.1%	-	-	0.1%	0.3%	0.0%
BA.2.75.1	0.1%	-	-	0.0%	0.0%	-	-	-	-
BA.2.75.2	0.3%	0.4%	0.5%	0.3%	1.2%	0.6%	0.7%	2.0%	0.8%
Other BA.2	1.5%	1.7%	1.8%	1.6%	2.0%	2.7%	2.7%	3.5%	3.9%
<b>BA.3</b>	-	-	-	-	-	-	-	-	<b>0.0%</b>
<b>BA.4</b>	<b>8.0%</b>	<b>7.2%</b>	<b>6.4%</b>	<b>7.2%</b>	<b>6.9%</b>	<b>6.3%</b>	<b>5.8%</b>	<b>4.5%</b>	<b>3.8%</b>
BA.4	0.1%	0.1%	0.0%	0.0%	0.3%	0.2%	0.1%	0.2%	-
BA.4.1	0.2%	0.1%	-	0.1%	0.1%	0.0%	0.0%	-	-
BA.4.6	6.3%	5.4%	4.9%	6.1%	5.7%	4.9%	4.5%	3.3%	3.0%
Other BA.4	1.4%	1.6%	1.5%	1.0%	0.8%	1.2%	1.2%	1.0%	0.8%
<b>BA.5</b>	<b>89.6%</b>	<b>90.0%</b>	<b>90.4%</b>	<b>90.4%</b>	<b>89.1%</b>	<b>89.6%</b>	<b>90.2%</b>	<b>89.2%</b>	<b>90.9%</b>
BA.5.1	9.6%	9.7%	8.4%	7.8%	6.5%	5.3%	5.1%	3.7%	3.1%
BA.5.2	14.5%	13.0%	11.7%	10.9%	9.4%	8.3%	8.4%	6.8%	4.4%
BA.5.2.1	22.7%	20.6%	19.5%	20.5%	18.0%	14.2%	11.0%	8.7%	6.8%
BF.7	2.2%	4.0%	4.1%	4.7%	5.2%	5.9%	6.3%	4.5%	6.2%
BQ.1	0.8%	1.1%	2.0%	2.9%	3.4%	5.9%	5.4%	6.2%	7.9%
BQ.1.1	0.9%	1.3%	2.0%	3.3%	6.0%	7.2%	10.8%	13.8%	16.7%
Other BA.5	38.9%	40.3%	42.7%	40.3%	40.6%	42.8%	43.2%	45.5%	45.8%
<b>Other variants</b>	<b>0.4%</b>	<b>0.6%</b>	<b>0.5%</b>	<b>0.3%</b>	<b>0.8%</b>	<b>0.7%</b>	<b>0.3%</b>	<b>0.3%</b>	<b>0.4%</b>
<b>Other</b>	-	-	-	-	<b>0.0%</b>	-	-	-	-

<b>Variant Grouping</b>	<b>Sep 25, 2022</b> (n=3,879)	<b>Oct 02, 2022</b> (n=3,821)	<b>Oct 09, 2022</b> (n=3,866)	<b>Oct 16, 2022</b> (n=4,063)	<b>Oct 23, 2022</b> (n=3,954)	<b>Oct 30, 2022</b> (n=3,257)	<b>Nov 06, 2022</b> (n=2,905)	<b>Nov 13, 2022</b> (n=2,802)	<b>Nov 20, 2022</b> (n=2,709)
<b>Recombinants</b>	<b>0.4%</b>	<b>0.6%</b>	<b>0.5%</b>	<b>0.3%</b>	<b>0.8%</b>	<b>0.7%</b>	<b>0.3%</b>	<b>0.3%</b>	<b>0.4%</b>
XAC	-	-	-	-	-	-	0.0%	-	-
XAS	-	-	-	-	0.0%	0.0%	-	-	-
XAY.1	-	-	-	0.0%	-	-	-	-	-
XAZ	0.1%	0.2%	0.1%	0.1%	-	0.1%	-	-	-
XBB	0.1%	0.1%	0.1%	0.0%	0.3%	0.1%	0.1%	0.1%	0.1%
XBB.1	0.1%	-	0.1%	0.1%	0.2%	0.3%	0.1%	0.1%	0.1%
XBB.1.1	-	-	-	-	-	-	-	0.0%	-
XBB.1.3	-	-	-	-	-	-	-	-	0.0%
XBB.1.5	-	-	-	-	-	-	-	-	0.1%
XBB.2	-	0.1%	-	0.0%	0.1%	-	0.1%	0.1%	0.1%
XBB.3	0.1%	-	-	-	0.1%	0.1%	-	0.0%	-
XBB.4	0.0%	-	-	-	-	-	-	-	-
XBC.1	-	-	-	-	-	0.0%	0.0%	-	-
XBD	-	0.1%	0.2%	0.1%	0.1%	0.1%	-	-	-
XBE	0.0%	0.1%	0.0%	-	-	-	-	-	-
XBF	-	-	-	-	-	-	-	-	-
XBG	-	-	0.0%	-	-	-	-	-	-
XBH	-	-	-	-	-	0.0%	-	-	-
XE	-	-	-	-	0.0%	-	-	-	-

[Downloadable data \(in .csv format\).](#)

**Note:** The shaded columns on the right represent a period of accumulating data.

### **Contributing laboratories:**

- Saskatchewan - Roy Romanow Provincial Laboratory (RRPL)
- Public Health Ontario (PHO)
- Nova Scotia Health Authority
- Newfoundland and Labrador - Eastern Health
- New Brunswick - Vitalité Health Network
- Manitoba Cadham Provincial Laboratory
- Laboratoire de santé publique du Québec (LSPQ)
- BCCDC Public Health Laboratory

- Alberta Precision Labs (APL)
- National Microbiology Laboratory (NML) - supplemental sequencing for all provinces and territories

National Microbiology Laboratory (NML) - supplemental sequencing for all provinces and territories

# COVID-19 epidemiology update: Outbreaks

Last updated: 2022-12-23

 PDF

Summary of COVID-19 cases, hospitalizations and deaths, cases following vaccination, testing and variants of concern across Canada and over time. Older versions of this report are available on the [archived reports page](#).

## Outbreaks

**Update schedule:** We update this page every Monday. This page was last updated on December 23, 2022, 10 am ET.

The Public Health Agency of Canada (PHAC) regularly receives COVID-19 outbreak data from health authorities in the provinces and territories. This page summarizes outbreaks in Canada by setting and by size, and is updated weekly. Data may change retroactively if there are changes to:

- provincial or territorial COVID-19 testing strategies
- provincial or territorial reporting of outbreaks
- data collection methods, or
- outbreak management methods

Outbreak definitions vary across the country, but we use a national outbreak definition for all outbreaks. An outbreak is 2 or more confirmed cases of COVID-19 which are epidemiologically linked to a specific setting or location. It does **not** include:

- households (since household cases may not be declared or managed as an outbreak if the risk of transmission is contained)
- cases that are geographically clustered (such as in a region, city, or town) but not epidemiologically linked
- cases attributed to community transmission

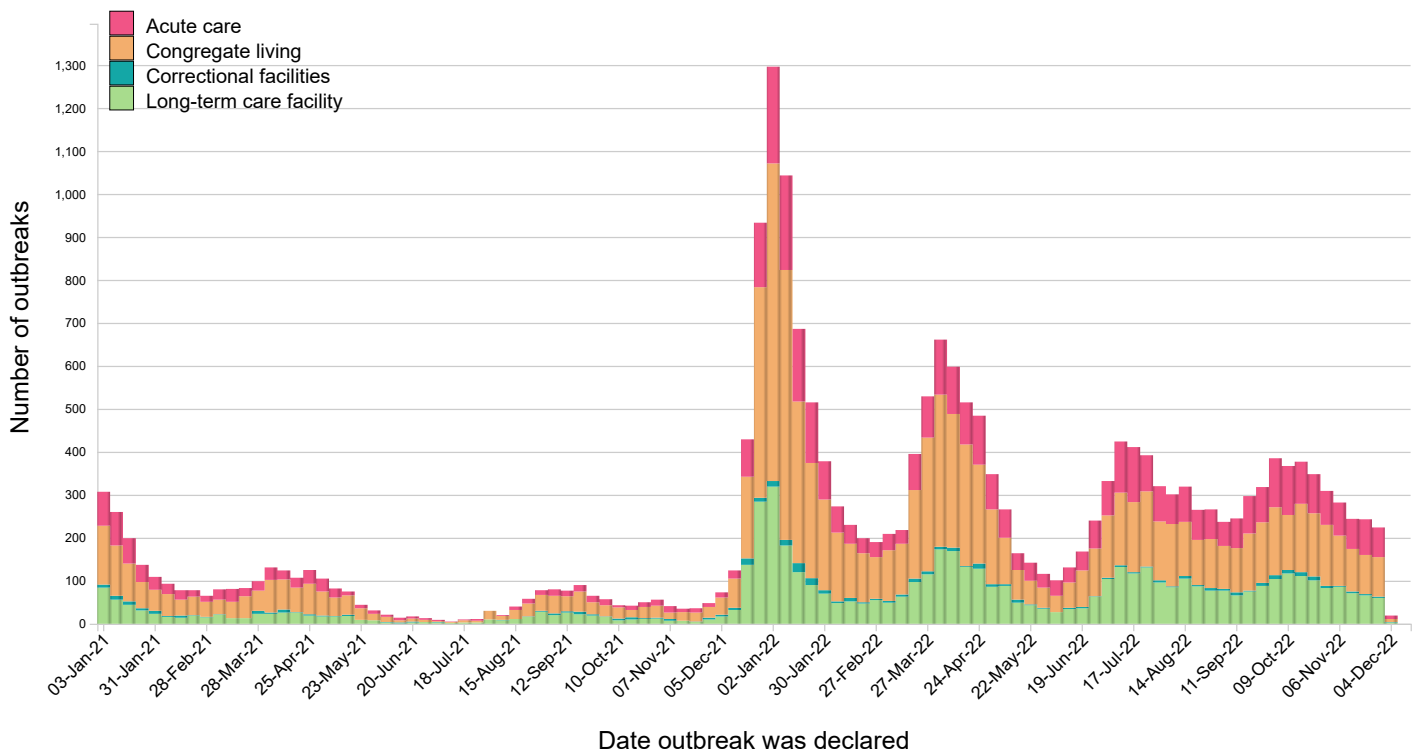
In December 2021, the highly contagious Omicron variant caused a rapid increase in cases. This surge affected public health and testing capacity, which led to a change in testing strategies and limited contact tracing. This made it harder for provinces and territories to link cases. As a result, outbreaks were undercounted. The provinces and territories still consistently report cases of COVID-19 in high-priority settings. However, most no longer report cases in community settings, such as schools, recreational facilities and stores.

- **Acute care:** Hospital or similar setting where patients receive short-term treatment for an injury or severe episode of illness, an urgent medical condition, or during recovery from surgery. Acute care settings include:
  - hospitals
  - emergency departments
  - urgent care
  - transitional care
  - convalescent care
  - short-term inpatient rehabilitation centres
- **Congregate living** includes:
  - retirement residences
  - assisted/supportive living
  - group homes
  - residential treatment centres
  - transition centres
  - shelters
  - student dormitories
- **Correctional facilities** include:
  - provincial jails and prisons
  - federal jails and prisons
  - youth correction centres
- **Long-term care facilities** include both public and private facilities that provide living accommodations for people who require full-time supervised care, including professional health services, personal care, and other services (meals, laundry, cleaning)

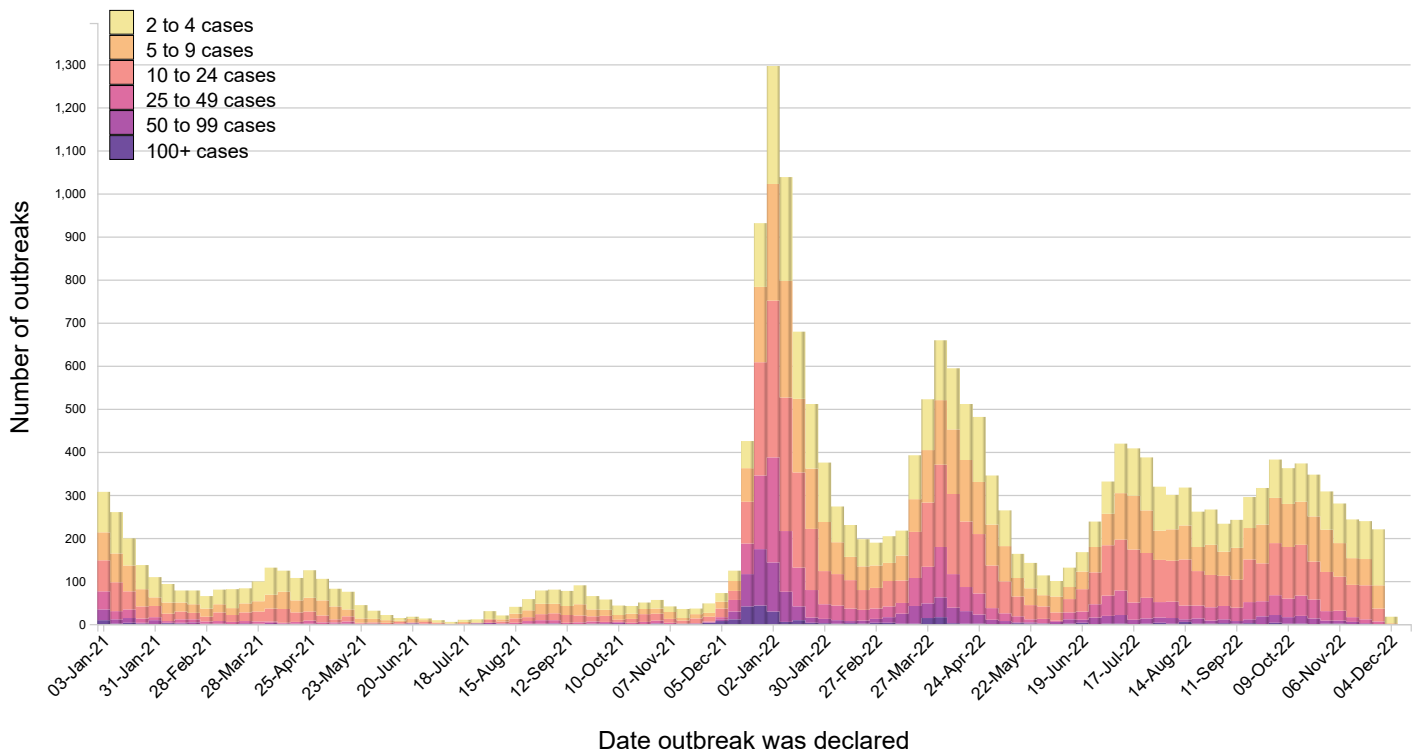
### **Showing outbreaks data from 2021-01-03 to 2022-12-04.**

The shaded area on the far right of Figure 1 and Figure 2 represents a period of accumulating data. This is the period of time (1 to 2 weeks) before the latest outbreaks are reported to PHAC. This delay is a result of the time required to identify cases and declare outbreaks. We update this figure as more data becomes available.

**Figure 1. Weekly number of outbreaks by setting**



**Figure 2. Weekly number of outbreaks by outbreak size for all settings** all settings ▼



Between January 2, 2022 and December 4, 2022:

- Acute care accounted for 23% of outbreaks. The median outbreak size was 7 cases/outbreak.
- Congregate living accounted for 49% of outbreaks. The median outbreak size was 7 cases/outbreak.



- Correctional facilities accounted for 2% of outbreaks. Median outbreak size was 11 cases/outbreak.
- Long-term care facilities accounted for 26% of outbreaks. Median outbreak size was 14 cases/outbreak.

**Table 1. Summary statistics of COVID-19 outbreak size by setting, all time**

<b>Setting</b>	<b>Median case count</b>	<b>Average case count</b>	<b>Number of outbreaks</b>
Acute care	7	10	5,136
Congregate living	7	14	10,788
Correctional facilities	11	35	427
Long-term care facility	14	24	5,636

**Date modified:**

2022-12-23