

ENHANCED EPIDEMIOLOGICAL SUMMARY

Comparison of COVID-19 Hospitalizations and Deaths in 2022 and 2021

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Purpose

This report highlights differences in the incidence of COVID-19 hospitalizations and deaths in Ontario between January 1 to December 31, 2022 and January 1 to December 31, 2021.

Please visit the interactive [Ontario COVID-19 Data Tool](#) to explore data from the entire COVID-19 pandemic (i.e., January 2020 onward) by public health unit, age group, sex, and time. For more detailed information on COVID-19 vaccine uptake in Ontario, please refer to the [COVID-19 Vaccine Uptake in Ontario](#) report. For information on variants of concern in Ontario, please refer to the [SARS-CoV-2 Genomic Surveillance in Ontario](#) report.

Highlights

- Differences in circulating SARS-CoV-2 variant characteristics (e.g., transmissibility and immune evasion), public health measures, COVID-19 vaccine uptake, population immunity, and COVID-19 vaccine effectiveness against circulating SARS-CoV-2 lineages impact the incidence of severe COVID-19 outcomes, including hospitalizations and deaths.
- In Ontario, there were a total of 29,524 COVID-19 hospitalizations in 2022 and 22,559 in 2021. The COVID-19 hospitalization and death rates in 2022 were 31% and 39% higher than in 2021, respectively (Tables 1 and 2, Figure 1).
- The rate of COVID-19 hospitalizations per 100,000 population was higher in 2022 than 2021 for all age groups except those aged 20 – 59 years. In 2021, the highest rate of COVID-19 hospitalizations per 100,000 was reported in those aged ≥ 80 (698.1), 60 – 79 (285.9), and < 1 (110.2) years compared to 2022 in those aged ≥ 80 (1,760.8), < 1 (537.9), and 60 – 79 (374.4) years.
- In Ontario, there were a total 7,625 COVID-19 deaths in 2022 and 5,485 in 2021. The rate of COVID-19 deaths was 39% higher in 2022 (51.4 per 100,000 population) compared to 2021 (37.0 per 100,000 population).
- The rate of COVID-19 deaths per 100,000 population was higher for all age groups except those aged 20 – 59 in 2022 compared to 2021. In 2021, the highest rates of COVID-19 deaths per 100,000 population were reported in those ≥ 80 (396.2) and 60 – 79 (71.5) years. In 2022, death rates were highest for individuals aged ≥ 80 and 60 – 79 years were 680.9 and 81.9 per 100,000 population, respectively.

Context

2021

The year 2021 marked the initial expanded distribution of COVID-19 vaccines with high uptake across eligible populations, the circulation of two dominant variants of concern (VOC), and a provincial reopening strategy to lift public health measures across numerous settings. In January 2021, reported COVID-19 cases and hospitalizations peaked after an upward trend in COVID-19 activity during the fall and winter of 2020 and then declined into the end of January 2021 following lockdowns initiated shortly after the December holiday season.^{1,2} Stay-at-home orders issued in January 2021 were phased out by various regions through February and early March 2021.³ The first Ontario cases of the B.1.1.7 (Alpha) VOC, which were detected in December 2020, proceeded to drive a surge in COVID-19 cases and hospitalizations beginning in late February 2021.^{1,4} Another provincial lockdown was issued in early April, the Alpha-driven wave peaked in mid-April 2021, and COVID-19 cases declined into the summer of 2021.⁵

The first supply of COVID-19 vaccines were available for prioritized groups starting at the end of December 2020 and into the early months of 2021.⁶ As the COVID-19 vaccine supply increased, the province moved into phase two of its distribution strategy in April 2021.⁷ COVID-19 activity decreased across the province from May to July 2021 alongside increasing vaccine uptake amongst the eligible population, and high vaccine effectiveness (VE) against Alpha VOC infection which offered protection against severe COVID-19 outcomes.^{6,8} By the end of July 2021, over 70.2% of Ontarians received at least one dose of a COVID-19 vaccine and 60.4% completed their primary series.⁶ Alongside high vaccine uptake, the province gradually lifted public health measures through the Roadmap to Reopen plan.⁹ By mid-August 2021, reported COVID-19 cases were largely driven by the B.1.617.2 (Delta) VOC and its sublineages.^{2,10} High VE estimates against symptomatic Delta infection and severe outcomes after a primary series of COVID-19 vaccine were also observed, with little waning of VE against severe outcomes.¹¹ On October 25, 2021, some public health measures were eased including lifting of capacity limits in many settings and ending of the COVID-19 vaccine passport system.¹² However, mask mandates remained in place during this period. In November 2021, COVID-19 booster doses were made available to high-risk groups aged 12 years and over and first doses were made available to those aged five to 11 years old.^{13,14} In December 2021, COVID-19 booster doses were made available to everyone 18 years and older.¹⁵ Towards the end of December 2021, the emergence of the B.1.1.529 (Omicron) VOC caused a rapid increase in cases.^{2,16}

2022

2022 marked the Omicron dominant period of the COVID-19 pandemic along with expanded COVID-19 booster dose vaccine eligibility, the introduction of bivalent COVID-19 vaccines, and further loosening of public health measures. Omicron sublineages have increased transmissibility and immune evasion characteristics, presenting more mild COVID-19 disease, and lowered VE estimates against infection and severe disease compared to Delta sublineages.^{16,17,18,19} In January 2022, Ontario returned to a modified Step Two of the Roadmap to Reopen after a surge in cases that started in December 2021.²⁰ A large number of the hospitalizations reported in 2022 resulted from this initial surge in cases as Omicron became dominant in the province. Rates of severe outcomes after this initial spike were consistently higher in 2022 as compared to 2021.

In February 2022, COVID-19 vaccine boosters became available for youth aged 12 to 17 years old.²¹ In April 2022, additional boosters for priority groups such as older Ontarians became available.²² In June 2022, the provincial mask mandates was lifted in most settings.²³ In July 2022, children aged six months to four years became eligible for a primary series of COVID-19 vaccines, and everyone aged 18 years and older became eligible for second boosters.^{22,24} In September 2022, children aged five and over became eligible for boosters.^{25,26} In the fall of 2022, bivalent booster doses became available for those 12 years and older, and in December for those aged five and over.^{26,27} Uptake of booster COVID-19 vaccines among eligible population slowed down and uptake was lower compared to the proportion of the population who had completed a primary series of vaccine.⁶ At the end of 2022, vaccine uptake among the eligible population under the age of 12 years was low and especially among those under the age of five years.⁶

Seroprevalence data indicated widespread infection by the Omicron VOC across the adult Ontario population during 2022. Population seropositivity due to SARS-CoV-2 infection increased steadily throughout 2022, reaching approximately 72% in mid-December 2022, suggesting a decreased proportion of severe outcomes per infection among adults during this time period.²⁸ Despite ongoing demonstrated effectiveness of COVID-19 vaccines against severe outcomes, lower severity compared to Delta and observed seropositivity due to infection, Omicron sublineages circulating in Ontario during 2022 have led to a larger absolute number of infections, and in turn, a larger number of hospitalizations.¹⁹

Results

Table 1: COVID-19 hospitalizations in 2022 compared to 2021, by age group

| Age Group (years) | Total number of COVID-19 hospitalizations reported in 2021 | Rate of COVID-19 hospitalizations per 100,000 population reported in 2021 | Total number of COVID-19 hospitalizations reported in 2022 | Rate of COVID-19 hospitalizations per 100,000 population reported in 2022 |
|-------------------|--|---|--|---|
| <1 | 150 | 110.2 | 732 | 537.9 |
| 1 – 4 | 121 | 21.0 | 505 | 87.6 |
| 5 – 11 | 76 | 7.1 | 232 | 21.6 |
| 12 – 19 | 209 | 16.0 | 258 | 19.7 |
| 20 – 59 | 8,729 | 108.3 | 4,700 | 58.3 |
| 60 – 79 | 8,562 | 285.9 | 11,212 | 374.4 |
| ≥80 | 4,712 | 698.1 | 11,885 | 1,760.8 |
| Overall | 22,559 | 152.2 | 29,524 | 199.1 |

Table 2: COVID-19 Deaths in 2022 compared to 2021, by age group

| Age Group (years) | Total number of COVID-19 deaths reported in 2021 | Rate of COVID-19 deaths per 100,000 population reported in 2021 | Total number of COVID-19 deaths reported in 2022 | Rate of COVID-19 deaths per 100,000 population reported in 2022 |
|-------------------|--|---|--|---|
| <20 | 7 | 0.23 | 28 | 0.90 |
| 20 – 59 | 663 | 8.22 | 549 | 6.81 |
| 60 – 79 | 2,141 | 71.5 | 2,452 | 81.9 |
| ≥80 | 2,674 | 396.2 | 4,596 | 680.9 |
| Overall | 5,485 | 37.0 | 7,625 | 51.4 |

Figure 1: COVID-19 Hospitalization and Death Rates per 100,000 population in Ontario for 2021 and 2022

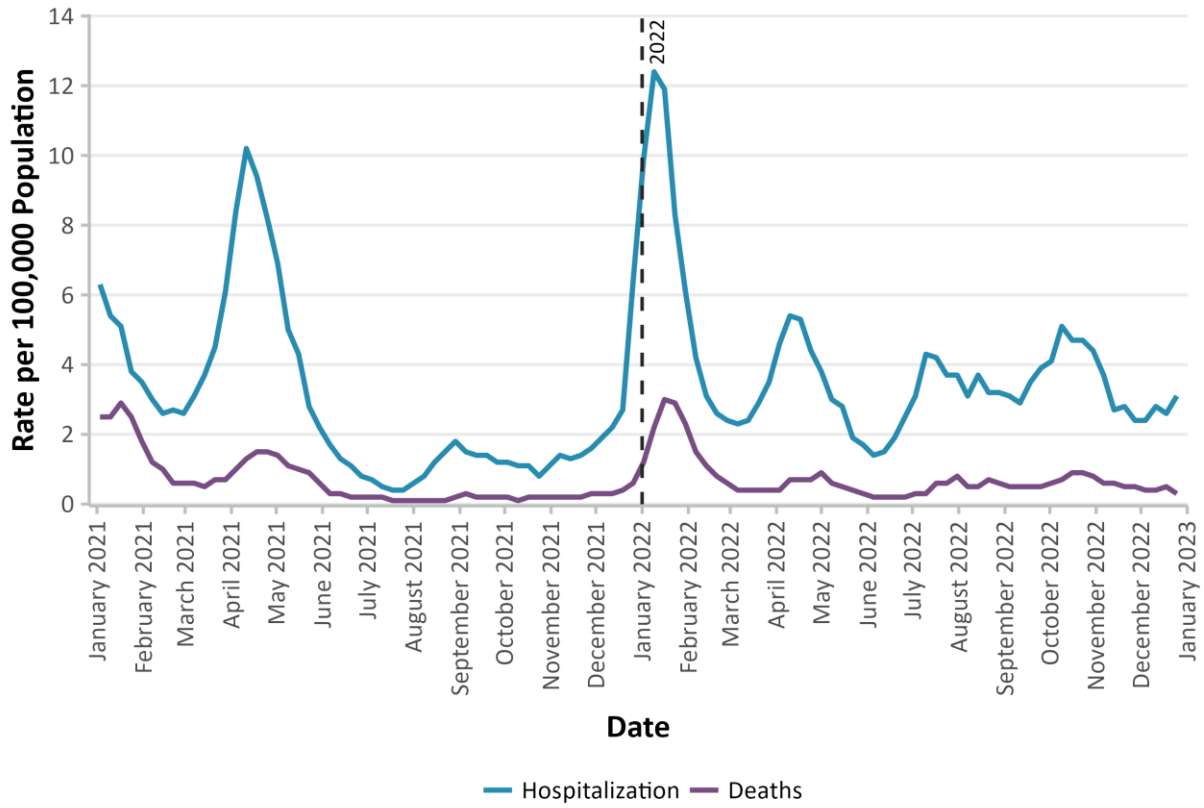


Figure 2: COVID-19 Hospitalizations per 100,000 population in Ontario, January 1 to December 31, 2022 compared to January 1 to December 31, 2021, by age group

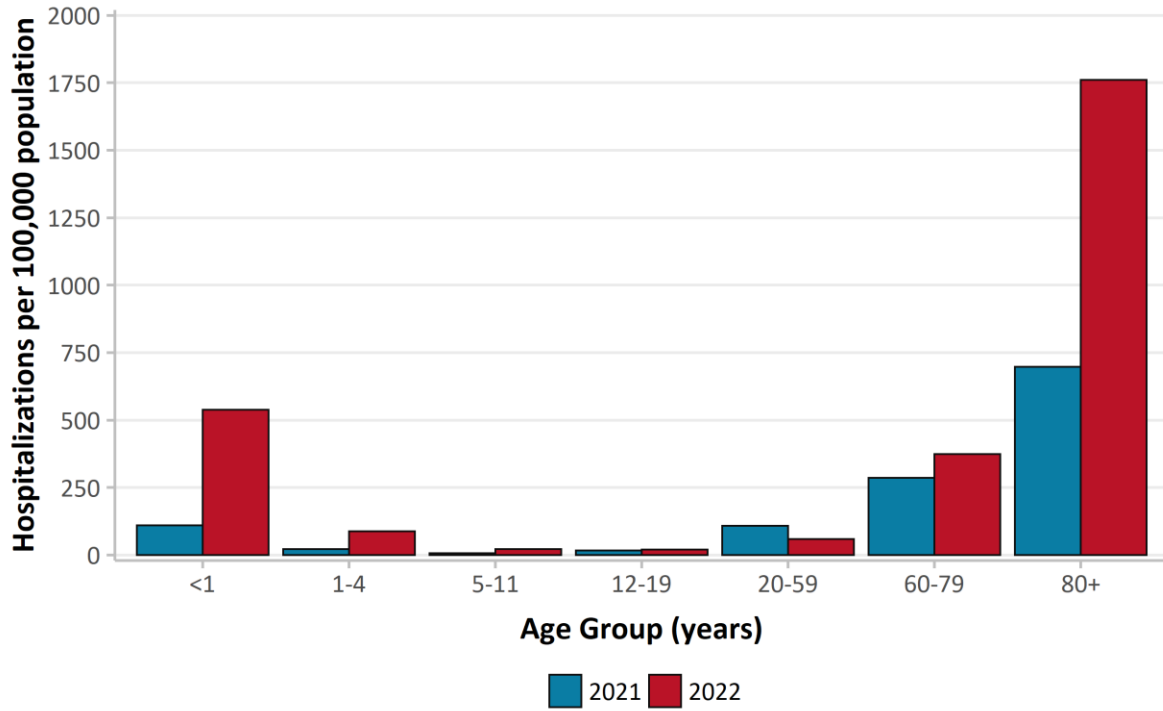
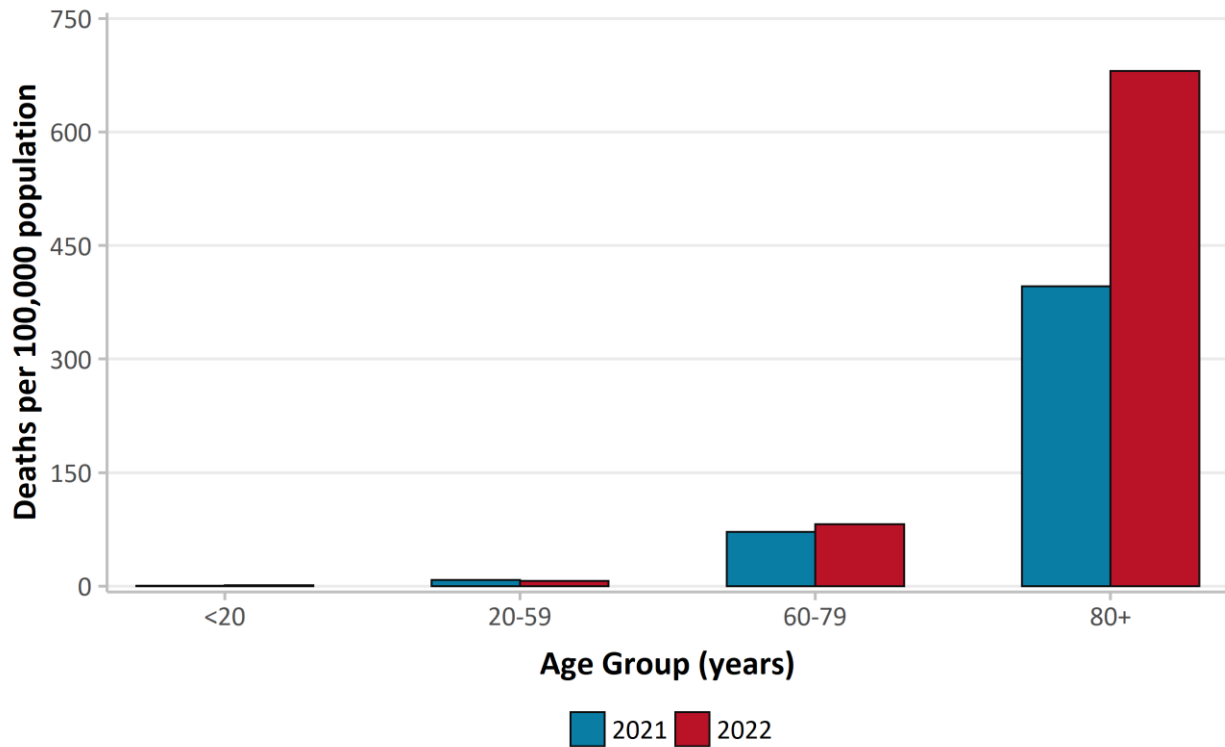


Figure 3: COVID-19 Deaths per 100,000 population in Ontario, January 1 to December 31, 2022 compared to January 1 to December 31, 2021, by age group



Data Source and Caveats

- The data for this report were based on information successfully extracted from the CCM for all PHUs by PHO as of:
 - **January 17, 2023 at 1 p.m.** for cases reported from March 1, 2022 to December 31, 2022
 - **January 16, 2023 at 9 a.m.** for cases reported from August 1, 2021 to February 28, 2022
 - **December 12, 2022 at 9 a.m.** for cases reported from January 1, 2021 to July 31, 2021
- Ontario population estimates were sourced from Statistics Canada. Population estimates 2001-2021: Table 1 annual population estimates by age and sex for July 1, 2001 to 2021, health regions, Ontario [unpublished data table]. Ottawa, ON: Government of Canada; 2022 [received April 22, 2022].
- Hospitalizations and deaths with unknown or missing ages (n=1) were excluded from this analysis.
- For surveillance purposes, a COVID-19 death is defined as a death resulting from a clinically compatible illness unless there is a clear alternative cause of death that cannot be related to COVID-19 (e.g., trauma, medically assisted death). There should be no period of complete recovery from COVID-19 between illness and reported death.
- Hospitalization includes all cases hospitalized (or that had their hospital stay extended) because of COVID-19. It includes cases that have been discharged from hospital as well as cases that are currently hospitalized. Hospitalization includes intensive care unit (ICU) cases but not emergency room visits.
- Further details on data caveats and methods are documented in the [Technical Notes](#) of the [Ontario COVID-19 Data Tool](#).

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