

Provisional death counts and excess mortality, January 2020 to May 2021

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COVID-19 continues to affect communities and families in Canada. Beyond deaths attributed to the disease itself, the pandemic could also have indirect consequences that increase or decrease the number of deaths as a result of various factors, including delayed medical procedures, increased substance use, or declines in deaths attributable to other causes, such as influenza.

To understand both the direct and indirect consequences of the pandemic, it is important to measure excess mortality, which occurs when there are more deaths than expected in a given period. It should be noted that, even without a pandemic, there is always some year-to-year variation in the number of people who die in a given week. This means that the number of expected deaths should fall within a certain range of values. There is evidence of excess mortality when weekly deaths are consistently higher than the expected number, but especially when they exceed the range of what is expected over several consecutive weeks.

From March 2020 to mid-May 2021, there were an estimated 19,979 excess deaths in Canada, or 6.0% more deaths than what would be expected were there no pandemic, after accounting for changes in the population, such as aging. Over this same period, 23,050 deaths were directly attributed to COVID-19.

Over the first 15 months of the COVID-19 pandemic, Canada experienced significant overall excess mortality over two distinct periods: the first in the spring of 2020 (from the onset of the pandemic in March, to June 2020), and the second from the fall of 2020 to the winter of 2021 (from the end of September 2020 through to the end of January). These periods corresponded with elevated levels of deaths directly attributable to COVID-19 itself. While COVID-19 deaths were still observed, nationally, no significant excess mortality has been observed in the provisional death data since February 2021.

As part of Statistics Canada's commitment to providing timely and relevant information on COVID-19 and its impact on Canadians, a new updated provisional dataset from the Canadian Vital Statistics Death Database, covering the period from January 2020 to May 2021, was released today. Updates were also made to the provisional death estimates, which have been adjusted, where possible, to account for the incomplete nature of the counts. The provisional estimates will continue to be revised in future releases, as more information is reported by provincial and territorial vital statistics agencies, and as estimation methods continue to be enhanced.

Excess mortality in the winter of 2021 does not correspond as closely to COVID-19 as in the spring of 2020

In the first months of the pandemic, from March to June 2020, 8,620 more lives were lost than expected. This is closely aligned with the 8,525 deaths caused by COVID-19 over the same period, which disproportionately affected Canadians older than 64 years of age, particularly in Quebec and Ontario. This period saw an average of 784 excess deaths per week. The number of excess deaths and the number of deaths caused by COVID-19 peaked in the last two weeks of April 2020. There were 2,738, or 25%, more deaths than expected in those two weeks, which is similar to the 2,725 deaths caused by COVID-19 during the same period.

Through the summer of 2020, the overall number of deaths in Canada fell generally within the range of what would be expected had there been no pandemic.

In the fall, the number of excess deaths and deaths attributable to COVID-19 started to rise again, and affected provinces saw relatively few COVID-19 deaths through the first months of the pandemic, notably Manitoba, Saskatchewan, Alberta and British Columbia. From the end of September 2020 to the end of January 2021, there were 10,278 deaths in Canada, which was 10% more deaths than expected. Over the same period, 9,540 lives were lost to COVID-19. While this second period of excess mortality was seven weeks longer than the first period (in the spring of 2020), the average number of excess deaths per week was lower, at 571.



The peak of this period was also less pronounced, with the highest number of excess deaths (905) being observed in the second week of December, representing 16% more deaths than expected. In the first period, the number of excess deaths and the number of COVID-19 deaths peaked in the same weeks. However, this was not the case in the second period. The weekly number of deaths attributed to COVID-19 continued to rise after the peak of excess deaths in December, reaching 955 deaths in the week ending January 23. A closer examination of the patterns for different age groups reveals a growing disconnect between the population groups experiencing excess mortality and the group with the most COVID-19 deaths.

The average age of people dying from COVID-19 has dropped since the beginning of 2021

During the first period of excess mortality in the spring of 2020, there were 4,252 excess deaths and 4,730 deaths caused by COVID-19 among individuals older than 84 years of age. In the second period of excess mortality (from September 2020 to the end of January 2021), the gap between these two numbers widened among this same age group, with 4,094 excess deaths and 5,195 deaths caused by COVID-19, according to the provisional data. The higher number of COVID-19 deaths may be attributable to the disease taking a heavy toll on some individuals who may have been at a high risk of dying over this period, regardless of the pandemic. In addition, the indirect effects of the pandemic, which may have led to decreases in the number of deaths attributable to other causes, could also be at play.

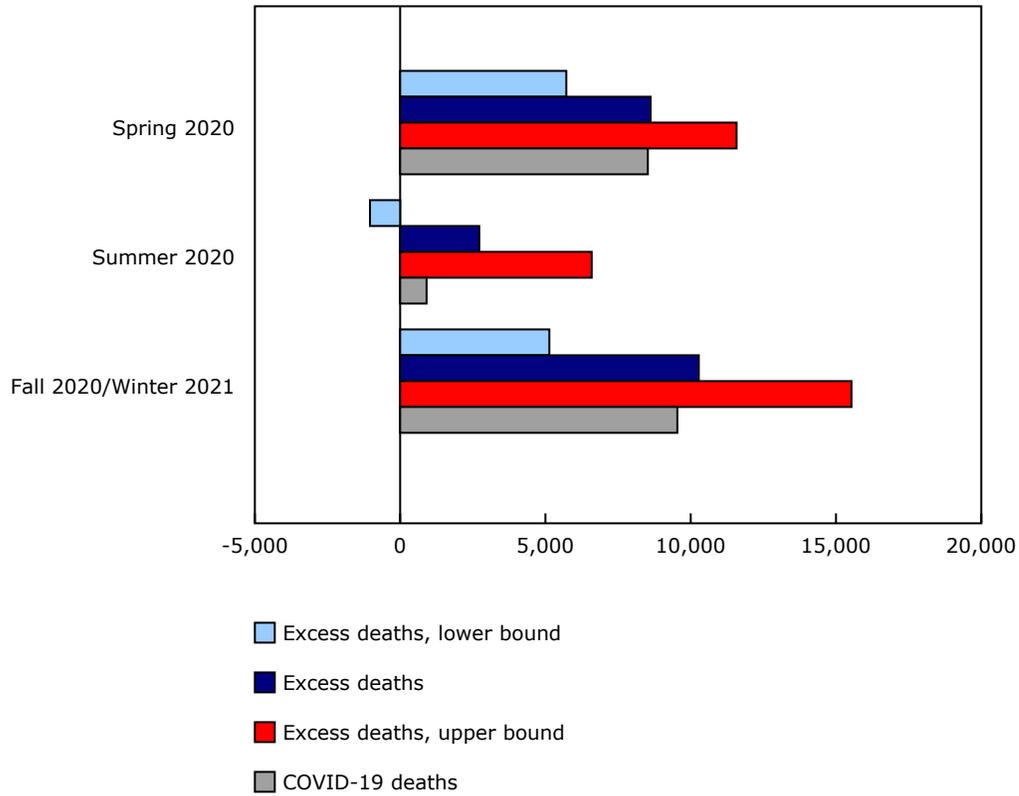
Furthermore, in the second period of excess deaths, the number of deaths attributed to COVID-19 among those over the age of 84 peaked at 525 in the week ending January 16, a week earlier than for the other age groups. Over the following weeks, the share of deaths caused by COVID-19 among those over the age of 84 fell from 56%, in mid-January, to 25%, in April. Prior to this, those aged 85 and older consistently accounted for half or more of weekly COVID-19 deaths. According to the provisional data, the average age of a COVID-19 decedent was around 83 years of age at the beginning of 2021. The average age of those who died of COVID-19 was also 83 years throughout 2020, but by the end of March 2021, the average age had fallen to roughly 76 years.

The disproportionate decrease in the number of COVID-19 deaths among those over age 84 in the first few months of 2021 may be due to various factors such as vaccination which began in December and targeted people in this age group. It may also be that those who were most vulnerable to the effects of the virus had died earlier in the pandemic.

While we have generally observed excess mortality that is consistent with periods of heightened COVID-19 mortality among the older age groups, this is not true for younger Canadians. Based on the provisional data, from the end of March 2020 to the end of April 2021, there were 7,150 more deaths than expected among those aged 0 to 64 years. Over the same period, 1,600 COVID-19 deaths have been attributed to those younger than 65, suggesting that, in addition to COVID-19, excess mortality may be related to the indirect consequences of the pandemic. Recently, evidence has been presented that this excess may be partly explained by increases in the number deaths associated with substance use and misuse, including unintentional poisonings as well as diseases and conditions related to alcohol consumption.

The emergence of COVID-19 variants of concern and the rollout of COVID-19 vaccines in Canada will continue to change the repercussions of the pandemic. To better understand the evolving impacts of the pandemic on mortality in Canada, Statistics Canada will continue to provide timely information on a regular basis on excess deaths, causes of death and comorbidities as it becomes available.

Chart 1
Provisional number of excess deaths and COVID-19 deaths, by period of excess mortality, Canada, March 2020 to January 2021



Source(s): Table 13-10-0784-01 and Table 13-10-0810-01.

Note to readers

A new updated provisional dataset from the Canadian Vital Statistics Death Database, covering the period from January 2020 to May 2021, was released today. Updates were also made to the provisional death estimates, which have been adjusted, where possible, to account for the incomplete nature of the counts. The provisional estimates will continue to be revised in future releases as more information is reported by provincial and territorial vital statistics agencies and as estimation methods continue to be enhanced.

The data released today are provisional, as they are not based on all deaths that occurred during the reference period because of reporting delays, and they do not include Yukon. Provisional death counts are based on what is reported to Statistics Canada by provincial and territorial vital statistics registries. Provisional death estimates have been adjusted to account for incomplete data, where possible. The numbers of excess deaths discussed in this analysis refer to provisional estimates. Information on the methods used can be found in the "Definitions, data sources and methods" section for [survey 3233—Canadian Vital Statistics - Death Database](#).

The provisional death counts and estimates released today may not match figures from other sources, such as media reports, or counts and estimates from provincial and territorial health authorities and other agencies.

There are number of ways to measure excess mortality, and each has its strengths and weaknesses. There are also a number of challenges with measuring excess mortality, most importantly, properly estimating the number of expected deaths that would occur in a non-COVID-19 context as a comparison basis for the current death counts. Important variations may be observed from year to year in the annual death counts, in particular in the less populated provinces and in the territories. Moreover, yearly death counts may be affected by changes in the composition of the population, in regard to age more particularly, and changes in mortality rates (e.g. improvement of mortality). In the Canadian context, with an aging and growing population, the number of deaths has been steadily increasing over recent years and so a higher number of deaths in 2020 and 2021 would be expected regardless of COVID-19. A second challenge is the difficulty to collect timely death counts. In Canada, death data are collected by the provincial and territorial vital statistical offices. The capacity to provide death data to Statistics Canada in a timely manner varies greatly. Taking these considerations into account, the method chosen by Statistics Canada, which has also been adopted by several other countries, including the US Centers for Disease Control and Prevention, to estimate expected deaths, is adapted from an infectious disease detection algorithm which has been largely utilized in the context of mortality surveillance in recent years.

The tabulation of the causes of death is based on the underlying causes of death, which is defined by the World Health Organization as the disease or injury that initiated the train of events leading directly to death, or as the circumstances of the accident or violence that produced the fatal injury. The underlying cause of death is selected from the causes and conditions listed on the medical certificate of cause of death completed by a medical professional, medical examiner or coroner. More information on causes of death, including the certification and classification of COVID-19 deaths, can be found in the study "[COVID-19 death comorbidities in Canada](#)."

The provisional figures on the number of deaths, the causes of death and excess mortality will continue to be updated as more information is reported to Statistics Canada by the provinces and territories and as further enhancements are made to the estimation models. More information on excess mortality during the COVID-19 pandemic in Canada is available in the article, "[Excess mortality in Canada during the COVID-19 pandemic](#)." Detailed information on the causes of death in Canada for 2020 will be released on January 24, 2022.

Rates are a useful tool for comparing characteristics across different populations, different segments of a population, or the same population over time. One type of rate is a percentage, i.e. the number of individuals exhibiting a characteristic or particular behaviour per 100 people. When rates are used to examine unusual events, such as death due to a particular cause, they are often expressed as the number of people or occurrences per 100,000 individuals in the population. As with percentages, these rates take into account the underlying population size.

A number of different reference periods have been used in this article:

- March 2020 to mid-May 2021 refers to the period from the week ending March 28, 2020, to the week ending May 15, 2021.
- March 2020 to the end of April 2021 refers to the period from the week ending March 28, 2020, to the week ending May 1, 2021.
- March 2020 to June 2020 (or the first period of excess mortality) refers to the period from the week ending March 28, 2020, to the week ending June 6, 2020.
- September 2020 to the end of January 2021 (or the second period of excess mortality) refers to the period of the week ending September 26, 2020, to the week ending January 23, 2021.

Available tables: [13-10-0768-01](#), [13-10-0783-01](#), [13-10-0784-01](#), [13-10-0792-01](#) and [13-10-0810-01](#).

Definitions, data sources and methods: survey number [3233](#).

To facilitate the identification of trends in excess deaths by province or territory, the product "[Provisional weekly estimates of the number of deaths, expected number of deaths and excess mortality: Interactive Tool](#)" has been updated.

To facilitate the identification of trends in the number of weekly deaths by age group and sex and by province or territory, the product "[Provisional weekly death counts: Interactive tool](#)" has also been updated.

For more information, or to enquire about the concepts, methods or data quality of this release, contact us (toll-free 1-800-263-1136; 514-283-8300; STATCAN.infostats-infostats.STATCAN@canada.ca) or Media Relations (613-951-4636; STATCAN.mediahotline-ligneinfomedias.STATCAN@canada.ca).