

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

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The COVID-19 pandemic continues to affect communities and families in Canada. Beyond deaths attributed to the disease itself, the pandemic could also have indirect consequences leading to an increase or decrease in the number of deaths due to various factors, including delayed medical procedures, increased substance use, or a decline 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 during a period of time than what would have been expected for that 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 the number of weekly deaths is consistently higher than what is expected, and even more so when numbers exceed the expected range over consecutive weeks.

While we sometimes observe excess mortality that is consistent with the number of deaths attributed to COVID-19, data reveal that indirect consequences of the pandemic are also having a significant impact on the number of excess deaths in Canada, particularly among younger Canadians. Based on the newly updated provisional dataset released today from the Canadian Vital Statistics Death Database, from the end of March 2020 to the beginning of April 2021, an estimated 62,203 deaths were reported among Canadians aged 0 to 64. This represents 5,535 more deaths than expected were there no pandemic, after accounting for changes in the population such as aging. Over the same period, 1,380 COVID-19 deaths have been attributed to the same age group (those younger than 65), suggesting that the excess mortality is, in large part, related to other factors such as increases in the number of deaths attributed to causes associated with substance use and misuse, including unintentional (accidental) poisonings and diseases and conditions related to alcohol consumption.

Deaths caused by accidental poisonings increase to a new high during the pandemic

To better understand excess mortality not directly attributed to COVID-19, patterns in mortality for specific causes of deaths were examined. There has been concern that deaths from certain causes not related to COVID-19 may have increased from what would have been expected were there no pandemic. Mortality patterns from unintentional poisoning have been of particular interest, as there is evidence in Ontario, Alberta, and British Columbia that substance use has increased in 2020 compared with previous years, while availability and access to harm reduction programs, supervised consumption services, and in-person support services for substance use may have been disrupted during the pandemic. Deaths from accidental poisoning can include different circumstances such as individuals using substances recreationally along with those who mistakenly ingest too much prescription or over-the-counter medications.

Based on the provisional data received so far from the provinces and territories, there were 3,770 deaths caused by unintentional poisoning in 2020 compared to 3,240 such deaths in 2019, with appreciable increases observed in Ontario (2,235 compared with 1,550) and Alberta (920 compared with 715). While the provisional data have caused concern for fewer than 70 overdose deaths in British Columbia, a report by the British Columbia Coroners Service on illicit drug toxicity deaths has stated a drastic increase in deaths in 2020 compared with 2019.

Nationally (excluding British Columbia and Yukon), the annual mortality rates for accidental poisonings from 2000 to 2020 have generally increased over time. In 2017, at the height of the opioid crisis, the annual mortality rate was 10.2 deaths per 100,000 people (3,230 deaths), the highest observed prior to 2020. The mortality rate in 2020, based on the provisional data, was 11.3 deaths per 100,000 people (3,705 deaths).

Unintentional poisonings include accidental overdoses of various illicit drugs, prescription and over-the-counter medications, alcohol, as well as poisonings from solvents and pesticides. An increase in the mortality rate from 4.7 deaths per 100,000 people (1,470 deaths) in 2017 to 5.3 deaths per 100,000 people (1,745 deaths) in 2020, was observed for the most common category of substances, which includes opioids, narcotics, and



hallucinogens. Similarly, the mortality rate attributed to the category that includes unspecified drugs and overdoses of a combination of drugs, increased from 3.9 deaths per 100,000 people (1,235 deaths) in 2017 to 4.6 deaths per 100,000 people (1,510 deaths) in 2020. Together, these two categories accounted for 88% of deaths by unintentional poisonings in 2020.

Data for Ontario indicate that the provisional number of deaths attributed to unintentional poisonings rose sharply at the beginning of the pandemic, with 605 deaths occurring in the period from April to June 2020, compared with 475 in the period from January to March 2020. In 2019, there were 475 deaths recorded in each of these three-month periods. Through the remainder of 2020, there were 1,155 deaths attributed to accidental poisonings compared with 600 such deaths over the same period in 2019. Many factors may have contributed to this increase, including Ontario's declaring a state of emergency in response to the COVID-19 pandemic on March 17, 2020. During the emergency period, facilities and services related to substance use harm reduction, in-person counselling and supports such as treatment clinics and supervised consumption sites were required to reduce capacity or close. A similar pattern of increase is observed in Alberta.

Increases in overdose deaths affect younger Canadians

Among those aged 0 to 44, the number of deaths attributed to accidental poisonings rose from 1,605 (8.9 deaths per 100,000 people) in 2019 and 1,830 (10.4 deaths per 100,000 people) in 2017 (the previously established height of the opioid crisis), to 2,125 (11.6 deaths per 100,000 people) in 2020. Similarly, for the 45 to 64 age group, there was an increase in the number of deaths due to unintentional poisonings in 2020 (1,395 or 15.9 deaths per 100,000 people) compared with 2019 (1,145 or 13.1 deaths per 100,000 people) and 2017 (1,195 or 13.6 deaths per 100,000 people).

As in the general population, these rises in accidental poisonings are characterized by increases in the number of deaths due to unintentional poisonings by narcotics, opioids and hallucinogens and unintentional poisonings by multiple and unspecified drugs and other medications and substances. The mortality rates for men in both age groups (0 to 44 and 45 to 64) and women aged 0 to 44 years surpassed the high rates of 2017.

Based on the provisional data, the mortality rates for accidental poisonings for Canadians aged 65 and over have decreased compared with those observed in 2019.

Alcohol-induced mortality increases in 2020 among younger Canadians

In 2020, the number and rate of alcohol-induced deaths increased among those under the age of 65. Among those aged 0 to 44, the number of alcohol-induced deaths rose from 325 (1.6 deaths per 100,000 people) in 2019 to 480 (2.3 deaths per 100,000 people) in 2020. There was also an increase in the number of alcohol-induced deaths in those aged 45 to 64 in 2020 (1,790 or 17.7 deaths per 100,000 people) compared with 2019 (1,525 or 15.0 deaths per 100,000 people). Alcohol-induced deaths include deaths attributed to a number of diseases and conditions related to the chronic use of alcohol, but exclude unintentional deaths, like traffic accidents, where alcohol is believed to be a contributing factor.

These increases were observed in both men and women and appear to be driven by a surge in the number of deaths attributed to alcoholic liver disease and mental and behavioural disorders due to use of alcohol (e.g. harmful use of alcohol, alcohol dependence syndrome, and withdrawal among others).

As with deaths attributed to accidental poisoning, the disruption of support programs and services to reduce alcohol use may also have been a factor contributing to the rise in alcohol-induced deaths during the pandemic. For instance, opportunities for in-person support groups may have been reduced due to physical distancing measures. Also, the economic, social, and psychological impacts of the pandemic as well as the public health measures in place may have played a role in increasing alcohol use among some individuals.

As the pandemic evolves and the number of COVID-19 infections recede, the mortality dynamics in Canada will also evolve. Some causes of death may show decreases in 2020 compared with previous years. For example, less road traffic travel, changes in routine behaviours, as well as reduced influenza activity (due to measures introduced to control the spread of the virus that causes COVID-19), may have led to decreases in deaths due to causes

related to these lifestyle adjustments. In addition, there may be fluctuations in patterns of mortality for certain health conditions that could have been affected by perceived or actual changes in access to health care services for prevention, diagnosis, and treatment of critical health conditions. To better understand the evolving impacts of the pandemic on mortality in Canada, Statistics Canada will continue to collaborate with vital statistics offices across Canada to regularly provide timely information on excess deaths, causes of death and comorbidities as it becomes available.

Note to readers

A new updated provisional dataset from the Canadian Vital Statistics Death Database, covering the period from January 2020 to April 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 non-COVID-19 context as a comparison basis for the current counts of deaths. Important variations may be observed from year to year in the annual counts of deaths, in particular in the less populated provinces and in the territories. Moreover, yearly counts of deaths 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 would be expected regardless of COVID-19. A second challenge is the difficulty to collect timely counts of deaths. 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](#)."

Information on cause of death is about 93% complete for the 2020 reference year, though this differs by province and territory. Deaths investigated by coroners or medical examiners, such as suicides, accidents and homicides, often require lengthy investigation. Consequently, information on the causes of death, particularly among people younger than 45, whose deaths are more likely to result in an investigation, typically requires more time before it is reported to Statistics Canada.

The category of accidental poisoning includes poisoning from various illicit drugs, prescription and over-the-counter medications, alcohol, as well as solvents and pesticides. Among the different classifications of accidental poisoning deaths reported so far in Canada occurring 2020, the most common (47%) was unintentional poisoning by and exposure to narcotics and psychodysleptics, which includes overdoses of opioids, narcotics, cannabis and hallucinogens, followed by 41% attributed to unintentional poisoning by other and unspecified drugs, medicaments, and biological substances (overdoes of unspecified drugs and overdoses of a combination of drugs, as well various medications such as blood thinners and blood pressure medications). A smaller proportion (5%) was attributed to Unintentional poisoning by and exposure to antiepileptic, sedative-hypnotic, anti-parkinsonism and psychotropic drugs (e.g., various antidepressants and stimulants) and 4% to Unintentional poisoning by and exposure to alcohol.

Alcohol-induced mortality includes death attributed to the following causes of death:

- Alcohol-induced pseudo-Cushing's Syndrome
- Mental and behavioural disorders due to use of alcohol
- Degeneration of nervous system due to alcohol
- Alcoholic polyneuropathy

- *Alcoholic myopathy*
- *Alcoholic cardiomyopathy*
- *Alcoholic gastritis*
- *Alcoholic liver disease*
- *Alcohol-induced acute pancreatitis*
- *Alcohol-induced chronic pancreatitis*
- *Finding of alcohol in blood*
- *Accidental poisoning by and exposure to alcohol*
- *Intentional self-poisoning by and exposure to alcohol*
- *Poisoning by and exposure to alcohol, undetermined intent.*

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 November 26, 2021.

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.

References to the period from the end of March 2020 to the beginning of April 2021 are to the period from the week ending March 28, 2020, to the week ending April 3, 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).