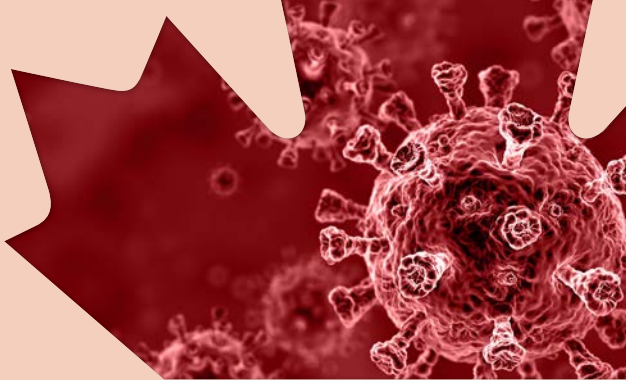
COVID-19 and deaths in older Canadians: Excess mortality and the impacts of age and comorbidity



The coronavirus disease (COVID-19) pandemic has had unprecedented consequences for Canada's aging population with the majority of COVID-19 deaths (approximately 80% during 2020) occurring among adults aged 65 years and older. Both advanced age and underlying chronic diseases and conditions contribute to these severe outcomes.

Excess mortality refers to additional mortality above the expected level (based on mortality in the same period in the preceding year or averaged over several preceding years in the same population).[1] This measure allows for the measurement of death directly and indirectly related to COVID-19 and provides a summary measure of its whole system impact in addition to its impact on mortality.[1]

Excess mortality in Canada during COVID-19

Using Statistics Canada's comparison of death counts for 2020 to the average annual deaths for the reference period from 2016 to 2019, this fact sheet presents an overview of the excess mortality attributable to the pandemic for Canadians aged 65 years and older. The estimates presented here provide an early indication of excess mortality related to the impact of COVID-19*.

In Canada in 2020:

- Total number of deaths observed:[2] 309,912
- Total number of deaths in older adults (65 and older):[3] 249,278

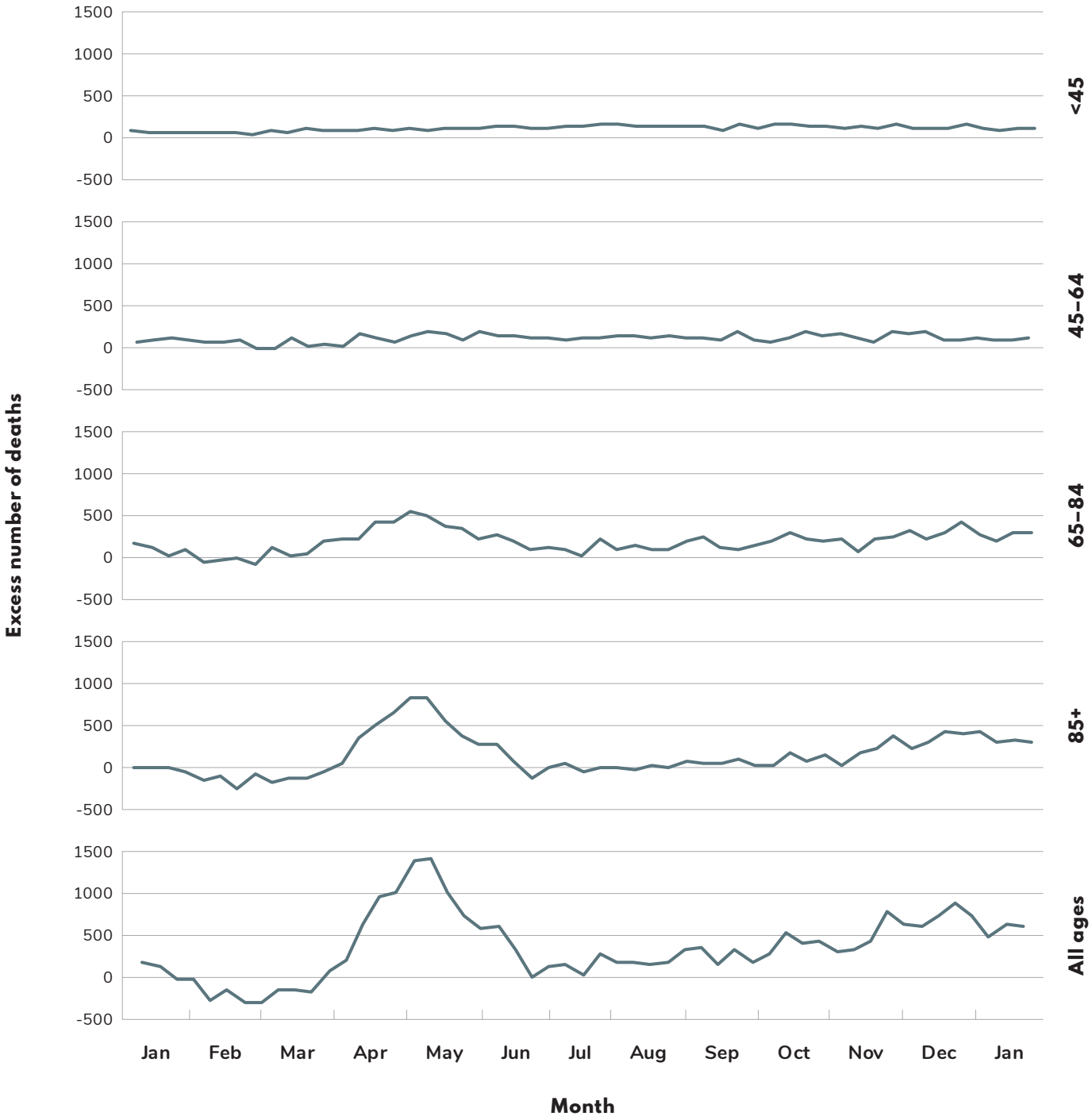
Of the 309,912 total deaths observed in 2020, an estimated 16,333 excess deaths occurred (expected deaths: 295,379).[2] Most of the excess death (11,386) was in older adults.

A peak of around 1,340 excess deaths was observed in the weeks ending April 25 and May 2, 2020 (**Figure 1**). This excess was mainly observed in older adults (around 1,200 excess deaths). Excess mortality declined after this first peak and increased slowly afterward. By December 2020, excess deaths were around 630 per week, with most (around 530) observed in older adults.

Older age has been a major contributor to excess mortality during the COVID-19 pandemic not just in Canada.[4, 5] Figure 2 compares the weekly death counts in Canada in 2020 to the average weekly death counts from 2015 to 2019 for people less than 65 years of age and those 65 and older. In 2020, there was a noticeable increase in the number of deaths occurring in Canadians aged 65 years and older compared to the average number of deaths in the five years prior to the pandemic, especially between mid-March and mid-May and toward the end of the year. There was little variation in weekly deaths between 2020 and the prior five years for individuals younger than 65 years of age. Similar patterns were observed for women and men (data not shown).

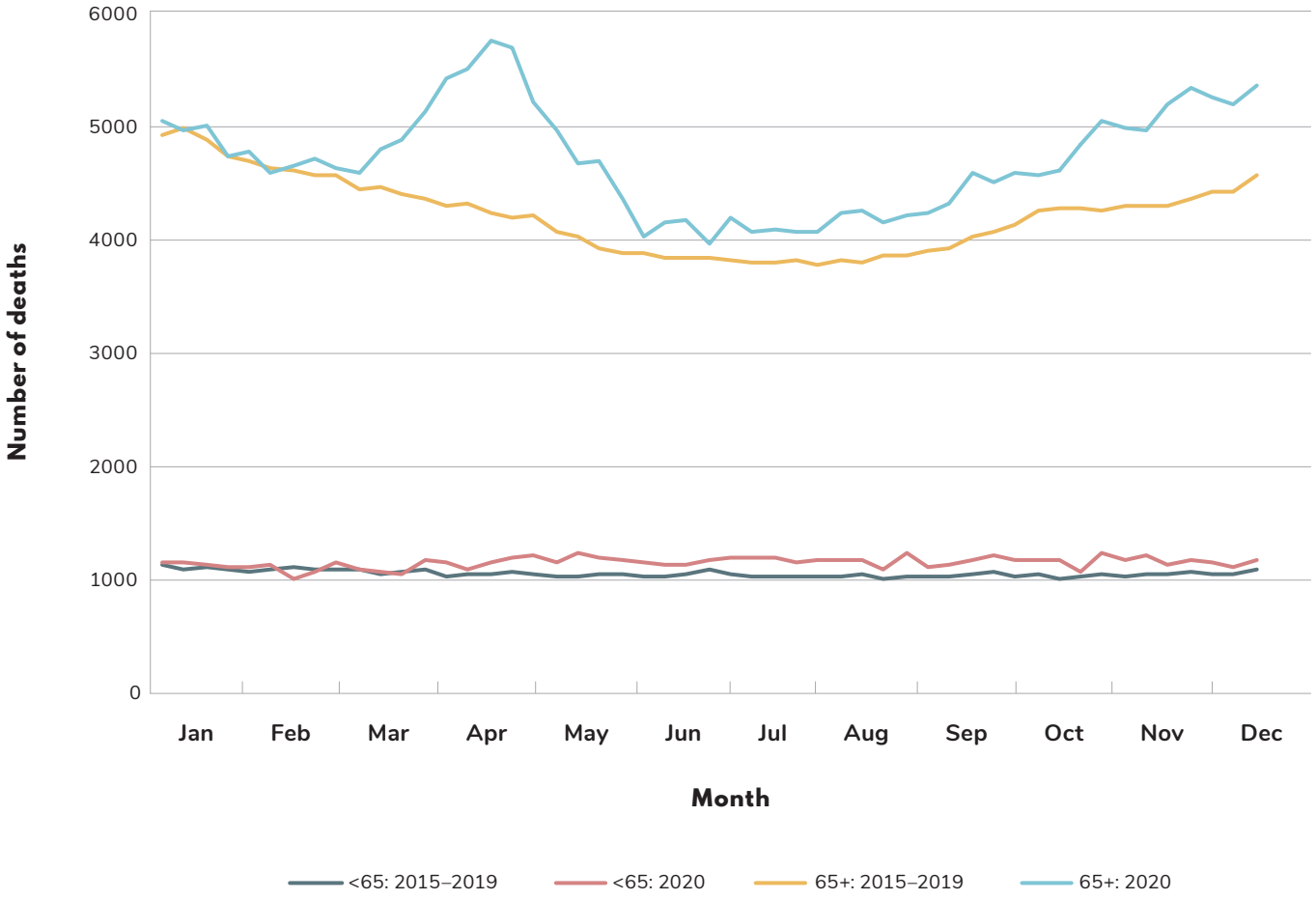
Of the 249,278 deaths among Canadians aged 65 years and older in 2020, 14,140 (or 5.7%) were coded to COVID-19, (i.e. deaths included ICD-10 codes U071 and U072),[6] which represents 87% of all excess deaths in 2020.

Figure 1: Weekly excess number of deaths** in Canada by age group, both sexes, 2020



Source: Statistics Canada. Table 13-10-0785-01 Adjusted number of deaths, expected number of deaths and estimates of excess mortality, by week, age group and sex.[2]
Data accessed April 16, 2021.

Figure 2: Weekly deaths in Canada, by age group, both sexes, 2020 and 2015 to 2019



Notes: Data presented for years 2015 to 2019 is the average weekly number of deaths combined for this five-year period.

Source: Statistics Canada. Table 13-10-0768-01 Weekly death counts, by age group and sex.[3] Data accessed April 16, 2021.

Comorbidity and excess mortality

Like older age, comorbidity has contributed to excess mortality during the pandemic.[4]

Comorbidity, often defined as the simultaneous presence of more than one disease in an individual, is known to be associated with poorer health outcomes, challenging disease management, and increased health utilization and costs.[7] In Canada, 73% of Canadians aged 65 years and older reported having one or more of 10 common chronic diseases†.[8]

Approximately 90% of COVID-19 related deaths that occurred between March and July 2020 occurred among individuals with pre-existing chronic conditions.[9]

Dementia (including Alzheimer disease) was the most common comorbidity listed with COVID-19 on the death certificates of individuals aged 65 years and over.[9] Other common comorbidities included pneumonia, hypertensive diseases and ischemic heart disease.[9]

More specifically, 45% of Canadians aged 85 years and over who died from COVID-19 between March and December of 2020 had dementia or Alzheimer disease.[9] However, more than 80% of COVID-19 deaths occurred in long-term care, a setting in which the age profile is older and dementia is common.[10]

Summary

In 2020, an estimated 16,333 excess deaths occurred (observed deaths: 309,912; expected deaths: 293,579) among Canadians.[2] Of the deaths among Canadians aged 65 years and older occurring during this period, 14,140 were coded to COVID-19, representing 87% of all excess deaths.[6] In addition, approximately 90% of COVID-19 related deaths among seniors 65 years and older occurred among individuals with pre-existing chronic conditions, with dementia as the most prevalent comorbidity.[10]

Older age and presence of chronic diseases have contributed to excess mortality during the COVID-19 pandemic. The number of COVID-19 attributed deaths do not account for all excess mortality during this period; therefore, other factors such as delays in seeking and accessing treatment and worsening of the overdose crisis have also likely contributed to the excess mortality.[1, 11, 12]

Canada's older population continues to grow rapidly, which increases the number of people living with multiple chronic conditions. These comorbidities are associated with poor health outcomes, which often leads to complex health care management. Surveillance of chronic diseases and comorbidities will continue to be an important focus for public health, both during and after the pandemic.

To learn more about aging and chronic diseases in Canada, read the Aging and Chronic Diseases: A profile of Canadian seniors report.

To access Canadian chronic disease data, visit the Canadian Chronic Disease Surveillance System Data Tool.

Notes

* These estimates are an early indication of excess mortality related to the impact of COVID-19 and should be interpreted with caution. Data presented in this fact sheet (accessed on April 16, 2021) are provisional and will change with time.

** Expected deaths for 2020 were modeled using information on observed and provisional death counts from 2016 to 2019.

† The ten common chronic conditions described include heart disease, stroke, cancer [ever had], asthma, chronic obstructive pulmonary disease, diabetes, arthritis, Alzheimer disease or other dementia, mood and anxiety disorders. Data are self-reported from the Canadian Community Health Survey 2017–18.

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