

Justice Centre Reports and Analysis

# The rise of excess and unexplained deaths in Canada



## Abstract

This report shows that excess deaths in Canada continue to be a significant problem in 2022 for all age groups. Excess deaths in 2022 increased to an estimated 37,000 compared to an estimated 21,000 in 2021—an approximate 75 percent increase. Further, as of June 2023, 24 percent of 2022 deaths from all causes were still categorized as “information unavailable” or were attributed to “ill-defined or unknown cause.” Canadian authorities cited excess deaths (when the cause was attributable to COVID-19) as justification for stringent pharmaceutical and non-pharmaceutical interventions over the course of the COVID-19 pandemic. Agencies such as Statistics Canada have provided little analysis of the causes of excess deaths occurring across Canada in 2022. Data releases and reports of causes of deaths have been subject to significant and inexcusable reporting delays. Further, it appears that deaths attributed to COVID-19 may have been overreported, especially in Québec. Citizens must have access to vital statistics if they are to trust and accept government interventions of the kind seen during the COVID-19 pandemic.

## Acknowledgements

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## Updates to this report

This is Version 1.0 of this report, which may be updated at any time with notice to the public via the Justice Centre website and social media channels.

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## Executive Summary

Canadians expect their governments to make data-informed public health decisions.

Canadians should have access to the data underlying those decisions. Indeed, governments have a democratic obligation to make the scientific and evidentiary bases of their public health decisions transparent. Statistical agencies, such as Statistics Canada, play an important role in capturing, interpreting, and distributing that data.

The COVID-19 pandemic was described by many as an unprecedented epidemiological emergency. This claim arose from an analysis of (among other factors) excess deaths: more people were dying than had been anticipated, based on projections that considered past mortality statistics and reasonable adjustments (e.g., changing demographics). In August 2023, excess deaths continue to be a significant problem in Canada. More people are dying than statisticians had expected. And yet, excess deaths no longer occupy the attention of politicians, public health officials, media, or the broader Canadian public. Excess deaths appear to be “out of sight, out of mind.”

*Deaths matter*, whether they can be attributed to an epidemiological emergency or not, and deaths are particularly concerning when mortality rates are higher than expected. Canadian reporting agencies, politicians, and health authorities should care about any death, especially when those deaths are data points in a story of unexpected and unexplained mortality rates in Canada.

Excess deaths in Canada increased by an estimated 75 percent in 2022 over 2021. A reported 38,500 excess deaths occurred in 2022; 16,300 were attributed to COVID-19. Excess mortality rates are particularly high among Canadians aged 0-44 and 45-64.

The problem is more significant than excess deaths, however. With respect to causes of deaths, 24 percent of 2022 deaths (n=approximately 79,000) have been classified as

“information unavailable” or “ill-defined or unknown cause.”<sup>1</sup> Further, as of the end of June 2023, Statistics Canada has not released its annual tables on detailed causes of death for 2021. (Statistics Canada usually releases its annual report in the November following the year under review.) The causes of a significant number of deaths are not being explored by statistical agencies.

Democracies do not function without access to data. Citizens must have access to vital statistics if they are to be expected to trust and accept government interventions of the kind seen during the COVID-19 pandemic. Governments, reporting bodies, and statistical agencies must begin to capture data about excess deaths and investigate their causes.

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<sup>1</sup> [Table 13-10-0792-01. “Provisional weekly estimates of the number of deaths, expected number of deaths and excess mortality, by age group and sex,”](https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1310079201) Statistics Canada, August 10, 2023, <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1310079201>. See also, [Table 13-10-0810-01. “Provisional weekly death counts, by selected grouped causes of death.”](https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1310081001) Statistics Canada, June 8, 2023, <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1310081001>.

## Introduction

During the COVID-19 pandemic, public health authorities and politicians emphasized a causal relationship between SARS-Cov-2 and unprecedented rates of illness and death. Canadians were presented with daily reports of cases and severe outcomes, which caused widespread alarm. These statistics were cited as justification for stringent non-pharmaceutical and pharmaceutical interventions.

Assessments of Canada's pandemic response began in 2022, with government representatives and medical researchers suggesting that public health measures and high vaccination rates had been effective and relatively successful in controlling the virus and mitigating severe outcomes.<sup>2,3,4</sup> "Success" would suggest that excess deaths have subsided, whether from COVID-19 or from other causes. This is not the case in Canada in 2022. Reports of "excess deaths" across Canada continue. In Statistics Canada's June 2023 release of provisional data for weekly deaths in Canada, the number of excess deaths that occurred between January and December 2022 was estimated to be 37,000 Canadians. Fewer than half of these deaths (n=16,300) were attributed to COVID-19. By comparison, excess deaths in 2020 and 2021 combined were 38,300, of which 30,500 were attributed to COVID-19. (See Figure 1)

While annual COVID-19 deaths remained at similar levels from 2020 to 2022, the number of excess deaths in 2022 equaled the *combined* number of excess deaths of the two previous years. In 2020 and 2021, public health officials and politicians cited the rate of excess deaths as justification for implementing extraordinary, global restrictions on Canadians (vulnerable and

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<sup>2</sup> See: "Canada's response to the initial 2 years of the COVID-19 pandemic: a comparison with peer countries," Fahad Razak, Saeha Shin, C. David Naylor and Arthur S. Slutsky CMAJ, June 27, 2022 194 (25) E870-E877; DOI: <https://doi.org/10.1503/cmaj.220316>.

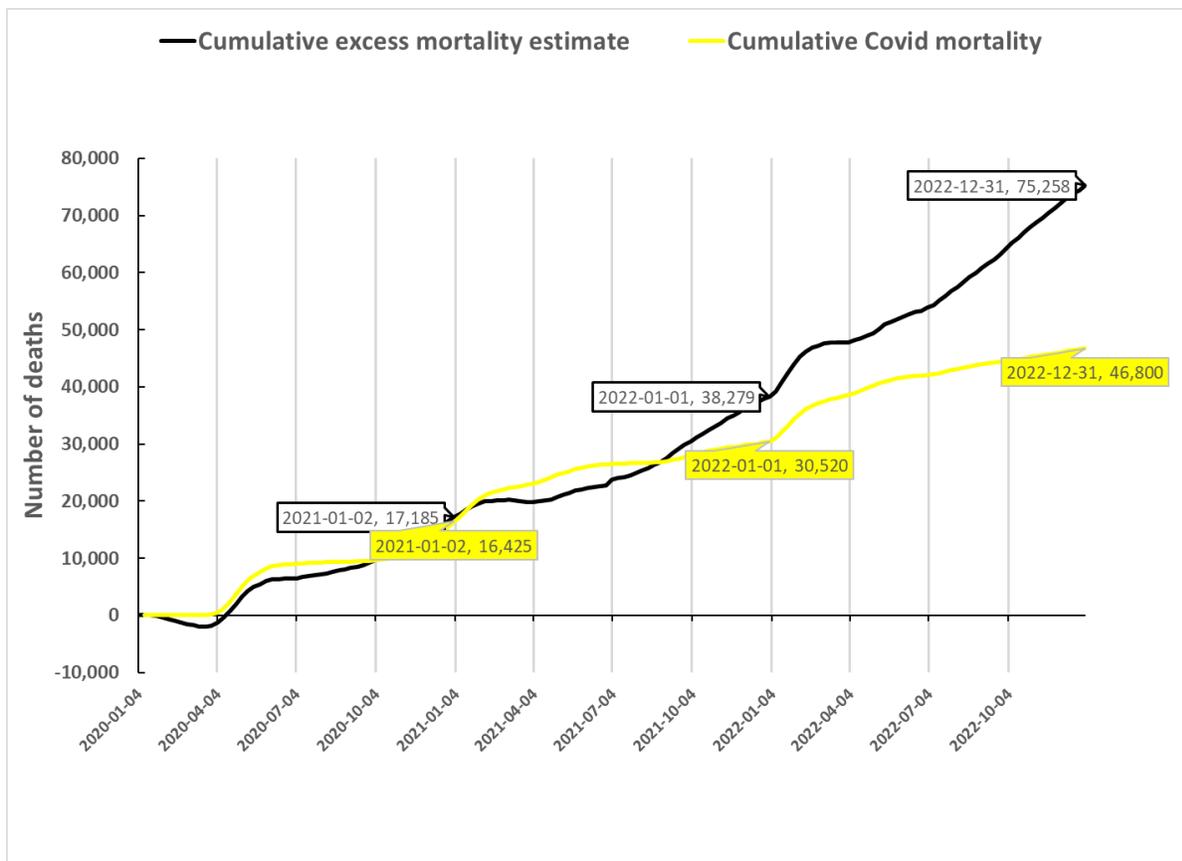
<sup>3</sup> "Counterfactuals of effects of vaccination and public health measures on COVID-19 cases in Canada: What could have happened?," Ogden NH, Turgeon P, Fazil A, Clark J, Gabriele-Rivet V, Tam T, Ng V., Can Commun Dis Rep 2022, <https://doi.org/10.14745/ccdr.v48i78a01>.

<sup>4</sup> See: "Excess Deaths Contradict Narrative of Success: New data on excess deaths suggests that Government responses to Covid have not been successful." Justice Centre for Constitutional Freedoms, September 13, 2022, [https://www.jccf.ca/published\\_reports/excess-deaths-contradict-narrative-of-success/](https://www.jccf.ca/published_reports/excess-deaths-contradict-narrative-of-success/).

otherwise) and for suspending civil liberties. In 2022, however, the sharp rise in excess deaths, particularly in the last half of 2022, has been mostly ignored.

**Figure 1 – Weekly cumulative excess and COVID-19 deaths, all ages<sup>5</sup>  
Canada, 2020 - 2022**

The black line is the cumulative number of deaths considered to be “excess” (“adjusted” minus “expected”).  
The yellow line is the cumulative number of COVID-19 deaths.  
Produced using Statistics Canada data and estimates (provisional).



<sup>5</sup> “Table 13-10-0792-01, Provisional weekly estimates of the number of deaths, expected number of deaths and excess mortality, by age group and sex,” Statistics Canada, June 6, 2023, <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1310079201>.

The main body responsible for collecting data on unexpected deaths is Statistics Canada.<sup>6</sup> Statistics Canada's mission is "[s]erving Canada with high-quality statistical information that matters." Statistics Canada states,

Objective statistical information is vital to an open and democratic society. It provides a solid foundation for informed decisions by elected representatives, businesses, unions, and non-profit organizations, as well as individual Canadians.<sup>7</sup>

Nonetheless, agencies such as Statistics Canada have provided little analysis of the causes of the excess deaths occurring across Canada in 2022. In recent releases of their weekly data, Statistics Canada failed to offer any analysis of excess deaths, *despite alarming rates of excess deaths in 2022*.<sup>8</sup> The data is either not captured, not analyzed, or not noticed. Where are the press conferences, the coverage, or the implementation of drastic measures to prevent excess deaths (especially from causes not attributable to COVID-19) or to intervene on the responsible causal factors? How can politicians declare the interventions of the past three years a "success" when so many Canadians continued to die unexpectedly in 2022? With few exceptions, Canada's public health authorities, government representatives, and media have not been forthcoming with explanations for recent excess deaths.

In this report, we show, using publicly available data<sup>9</sup> and international comparisons, that excess deaths in 2022 continue to be high in all age groups in Canada. We show that unexpected deaths among Canadians younger than 65 as well as among seniors continue to be higher than normal, and that Statistics Canada and other reporting agencies have not yet adequately explained this phenomenon. Data releases and reports of causes of unexpected deaths are subject to significant and intolerable reporting delays. We also suggest that deaths attributed to COVID-19 may have been overreported over the course of the pandemic,

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<sup>6</sup> "Raison d'être, mandate and role: who we are and what we do," Statistics Canada, Accessed August 4, 2023, <https://www.statcan.gc.ca/en/about/mandate>.

<sup>7</sup> "About us," Statistics Canada, Accessed August 4, 2023, <https://www.statcan.gc.ca/en/about/about>.

<sup>8</sup> "Provisional death counts and excess mortality, January 2021 to April 2023," Statistics Canada, July 13, 2023, <https://www150.statcan.gc.ca/n1/daily-quotidien/230713/dq230713a-eng.htm>.

<sup>9</sup> Notably, data from Statistics Canada and Our World in Data.

especially in the province of Québec. We conclude that unexpected deaths should be a significant concern for public health officials, politicians, and Canadians alike. Reporting agencies like Statistics Canada must do a better job of capturing and understanding data to provide “a solid foundation for informed decisions” in our democracy.

## Unexpected deaths in 2022 continue to be high in all age groups

Actuaries and statisticians develop reasonable estimates of how many Canadians will die under ‘normal’ circumstances for any given period based on demographics and other factors.

Statistics Canada identifies circumstances as abnormal when more people die than expected.

These unexpected deaths are called “excess deaths”.<sup>10</sup> (See the footnotes for Statistics Canada definitions of “expected deaths,” “adjusted deaths,” and “excess mortality.”)<sup>11-12</sup>

While statisticians can reasonably predict the number of deaths expected in a population year to year, there is no unique way to make these projections. Differences in computational models give rise to differences in the estimated number of excess deaths that will occur in

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<sup>10</sup> “Expected mortality refers to the “non-crisis mortality rate in the population of interest.” See: “Estimation of Excess Mortality,” Statistics Canada, August 28, 2020, [https://www.statcan.gc.ca/en/statistical-programs/document/3233\\_D5\\_V1](https://www.statcan.gc.ca/en/statistical-programs/document/3233_D5_V1) .

<sup>11</sup> A note on Statistics Canada definitions of adjusted, expected, and excess deaths: **Adjusted Deaths:** adjustments are made to the reported number of deaths by accounting for missing provincial data. (There is a 95 percent confidence that the expected number of deaths will be within a range as calculated by Statistics Canada.) **Expected mortality** refers to the non-crisis mortality rate in the population of interest. Statistics Canada estimates the non-crisis mortality rate using a model that takes into account recent trends. **Excess mortality or deaths** refers to the “mortality above what would be expected based on the non-crisis mortality rate in the population of interest. Excess mortality also encompasses collateral impacts of the pandemic, such as deaths occurring because of overwhelmed healthcare systems, or deaths avoided due to decreased air pollution or traffic.” See: “Estimation of Excess Mortality,” Statistics Canada, August 28, 2020, [https://www.statcan.gc.ca/en/statistical-programs/document/3233\\_D5\\_V1](https://www.statcan.gc.ca/en/statistical-programs/document/3233_D5_V1) .

<sup>12</sup> The model used by Statistics Canada to establish the baseline of expected deaths, for example differs from the projection for expected deaths used to calculate excess death counts in the Canadian Medical Association Journal (CMAJ) study: “Canada’s response to the initial 2 years of the COVID-19 pandemic: a comparison with peer countries”, Fahad Razak, Saeha Shin, C. David Naylor and Arthur S. Slutsky CMAJ, June 27, 2022 194 (25) E870-E877; DOI: <https://doi.org/10.1503/cmaj.220316>. Statistics Canada estimates of expected deaths for Canada are lower than those in the CMAJ paper which presents Our World in Data (OWID) data, resulting in higher excess death counts.

some future period. Statistics Canada projections of expected and excess deaths use statistical models that consider, among other variables, changes in demographics.<sup>13-14</sup> However, even without the benchmark estimates for expected deaths, we can see from these charts (Figure 2 and Table 1) that deaths have been consistently above historical levels in 2020, 2021 and 2022, for all age groups reported.

Since the onset of the pandemic in March 2020 and the subsequent government-imposed non-pharmaceutical interventions (e.g. lockdowns), deaths among Canadians under 65 years of age have been consistently above “normal.” A much higher baseline of mortality has developed for this group over the last three years, especially for those under age 45. Statistics Canada has typically pointed to drug overdoses and alcohol abuse as significant causal factors for this younger demographic, but more information on specific age groups and other possible causes is crucial.<sup>15</sup> The “Under 45” age group is not homogeneous; it includes infants, children, adolescents, and adults. The mortality levels, mortality rates, and cause of death vary significantly among these groups,<sup>16</sup> resulting in statistics that are not meaningful for assessing causes of death. Details by age group are typically released annually, but, as of August 2023, the 2021 data had not been made available, even though the Statistics Canada schedule indicates the data collection should terminate 13 months after year-end.<sup>17</sup>

COVID-19 does not explain most excess deaths among people under age 65. Where is the meaningful analysis from Statistics Canada that would provide the “solid foundation for

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<sup>13</sup> See “Estimation of excess mortality,” Statistics Canada, Accessed August 4, 2023, [https://www.statcan.gc.ca/en/statistical-programs/document/3233\\_D5\\_V1](https://www.statcan.gc.ca/en/statistical-programs/document/3233_D5_V1).

<sup>14</sup> See “Excess mortality in Canada during the COVID-19 Pandemic,” Statistics Canada, August 8, 2020, <https://www150.statcan.gc.ca/n1/en/pub/45-28-0001/2020001/article/00076-eng.pdf?st=POGMLtNJ>.

<sup>15</sup> “Research to Insights: A look at Canada’s economy and society three years after the start of the COVID-19 pandemic”, Statistics Canada, March 9, 2023, <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1310079201>. See section “Social challenges: Alcohol and drug use during the pandemic contributes to excess mortality among younger Canadians.”

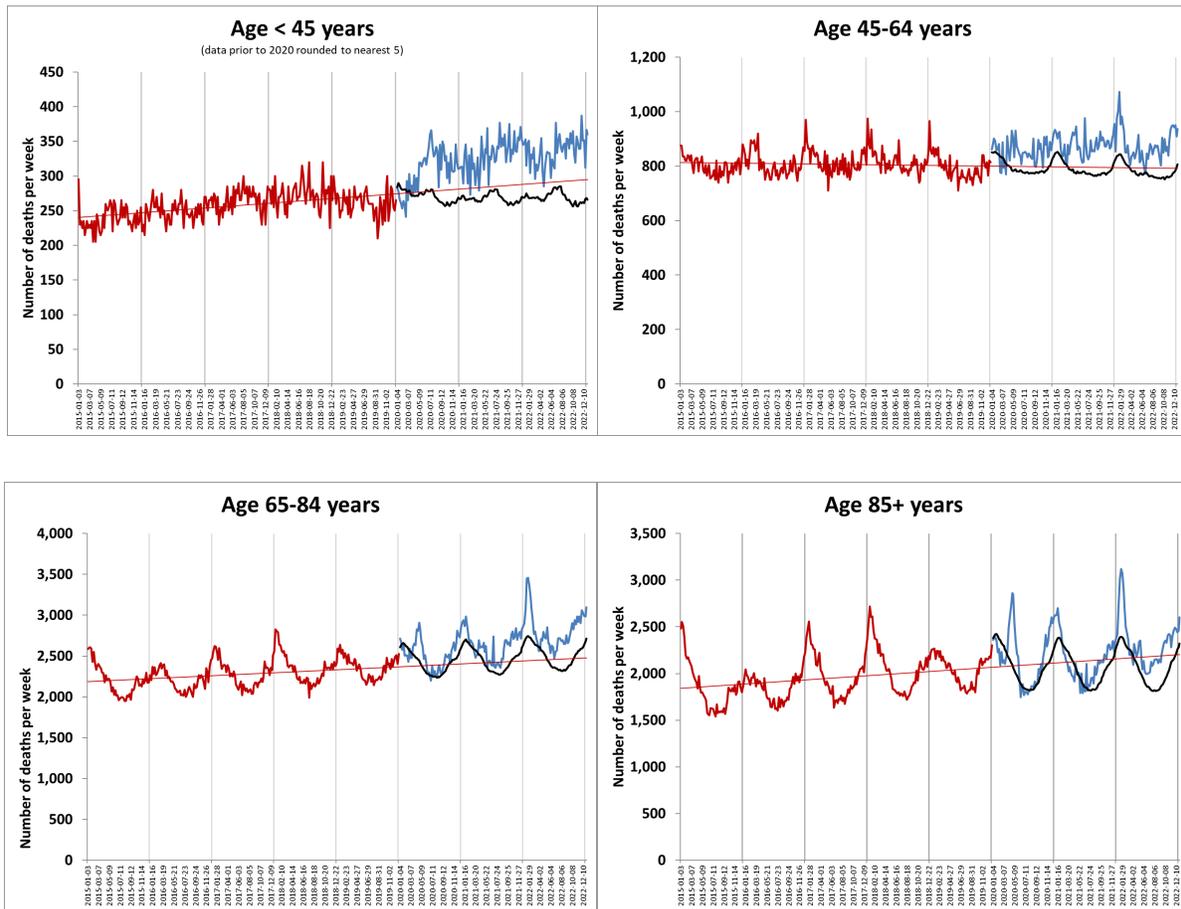
<sup>16</sup> “Deaths and age-specific mortality rates, by selected grouped causes,” Statistics Canada, January 24, 2022, <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1310039201>.

<sup>17</sup> “Canadian Vital Statistics-Death database (CVSD),” Statistics Canada, Accessed August 9, <https://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&SDDS=3233>.

informed decisions?” Vague responses suggesting that drug- and alcohol-related deaths are contributing to excess deaths is not a thorough or comprehensive analysis of the problem.

**Figure 2 – Weekly deaths by age group<sup>18</sup>**  
**Canada 2015 - 2022**

The bold red line is weekly deaths from 2015 to 2019.  
 The blue line is “adjusted” deaths (includes estimate for missing provincial data).  
 The black line is “expected” deaths  
 The straight red line is a linear trend extrapolated from 2015-2019 weekly death data.  
 Produced using Statistics Canada data and estimates (2020-2022, provisional).



<sup>18</sup> “Table 13-10-0768-01. Provisional weekly death counts, by age group and sex,” Statistics Canada, June 8, 2023, <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1310076801>. See also: “Table 13-10-0792-01. Provisional weekly estimates of the number of deaths, expected number of deaths and excess mortality, by age group and sex,” Statistics Canada, August 8, 2023, <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1310079201>.

Deaths among Canadians aged 65 and over do not indicate any declines in mortality rates in 2022 either. On the contrary, estimates of excess deaths in that group were higher in 2022 (n=29,800) than in 2020 and 2021 combined (n=23,500). This occurred after the largest medical intervention ever seen by Canadians. Figure 1 shows that total excess deaths are higher than those designated as COVID-19-related. Causes of excess deaths other than COVID-19 should be investigated.

*Table 1- Annual reported (adjusted), expected and excess deaths, by age group<sup>19</sup>  
Canada 2020 - 2022*

*Produced using Statistics Canada data and estimates (provisional).*

	2020	2021	2022
<b>Adjusted number of deaths</b>			
Age at time of death, 0 to 44 years	15,996	17,247	17,479
Age at time of death, 45 to 64 years	44,424	45,777	45,725
Age at time of death, 65 to 84 years	131,312	136,859	146,816
Age at time of death, 85 years and over	113,791	110,756	121,056
Age at time of death, all ages	305,528	310,653	331,167
<b>Expected number of deaths</b>			
Age at time of death, 0 to 44 years	14,118	13,927	13,997
Age at time of death, 45 to 64 years	41,494	41,070	40,600
Age at time of death, 65 to 84 years	125,915	128,072	130,516
Age at time of death, 85 years and over	107,784	107,393	107,516
Age at time of death, all ages	289,088	289,559	294,188
<b>Excess mortality estimate</b>			
Age at time of death, 0 to 44 years	1,878	3,320	3,482
Age at time of death, 45 to 64 years	2,930	4,707	5,125
Age at time of death, 65 to 84 years	5,397	8,787	16,300
Age at time of death, 85 years and over	6,007	3,363	13,540
Age at time of death, all ages	16,440	21,094	36,979

<sup>19</sup> "Table 13-10-0792-01. Provisional weekly estimates of the number of deaths, expected number of deaths and excess mortality, by age group and sex," Statistics Canada, August 10, 2023, <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1310079201>. Note: annual estimates using 52 weeks.

Statistics Canada data shows that overall excess deaths in 2022 increased by an estimated 75 percent over 2021. Total deaths in 2022 were more than 12 percent higher than expected. Excess deaths in 2021 were about 7 percent higher than expected. While the magnitude of excess death are only estimates and are dependent on accurate reporting of the observed number of deaths (as well as reasonable calculations of what we should expect), the graphs in Figure 2 show that excess death rates worsened in 2022 even after a significant percentage of Canadians had been vaccinated for COVID-19. (See Appendix B for rates of vaccination in Canada.) The absolute numbers of excess death each year are estimates, but their persistent upward trend should be a serious concern.

## **Causes of excess deaths**

While analyses of the causal factors behind excess deaths are unavailable or inadequate, we explore the magnitude of unexplained deaths in Canada, reports on the potential causes of excess deaths, the effect of overreporting deaths from COVID-19, and the possible role of pharmaceutical interventions in excess deaths.

### **Deaths from “unknown causes”**

Death counts for specific periods can change significantly with each data release due to reporting delays from the provinces. When possible, Statistics Canada adjusts for missing provincial data with respect to death counts. However, determining causes of death is also subject to significant delays. (Statistics Canada labels the weekly data that is released each month as “provisional.” Data is usually subject to revision for up to three years.) While COVID-19 deaths were reported publicly in real time throughout 2020-2022, determining causes for excess deaths that are not attributable to COVID-19 is proving to be a difficult task for the provincial bodies responsible for submitting the data to Statistics Canada.

The release of detailed annual causes of death data by age group for 2021 is an example of how difficult it is to categorize deaths by cause. For 2019, the annual detailed data was issued in November 2020; the same data for 2020 was scheduled to be released in November 2021 but was issued two months later in January 2022; *the 2021 data set has still not been released as of mid-August 2023.*

Selected causes of death are issued weekly by Statistics Canada. The largest category in the June 2023 release was a combination of the “Information unavailable” and “Ill-defined and unspecified causes,” representing 24 percent (n = 79,000) of all deaths.<sup>20-21</sup> Table 2 shows that total deaths from “unknown causes” vary among provinces, but, for Canada overall, these deaths in 2022 are well above comparable levels for 2020 (n=27,600 or 9 percent of all deaths) and 2021 (n=22,000 or 7 percent of all deaths), according to data released in June of 2021 and 2022. In a word, Canadians do not have access to any comprehensive analysis of the approximately 79,000 unexplained deaths that occurred in 2022. That so many deaths have no cause of death assigned to them raises questions of how and why these deaths are so difficult to categorize. What are the scientific, institutional, and political causes behind this failure to capture and understand Canadian data?

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<sup>20</sup> “Table 13-10-0810-01. Provisional weekly death counts, by selected grouped causes of death,” Statistics Canada, August 10, 2023, <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1310081001>.

<sup>21</sup> Approximately 6.1 percent of deaths were subject to autopsy from 2015-2020, an average of approximately 17,500 deaths annually. See: “Table 13-10-0716-01\_ Deaths subject to autopsy,” Statistics Canada, January 24, 2022, <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1310071601>.

**Table 2 - Deaths from “unknown causes” \* <sup>22</sup>**  
**Canada 2020 - 2022**

Produced using Statistics Canada data (provisional).

Statistics Canada RELEASE DATE Reporting Year	Jun-21 2020		Jun-22 2021		Jun-23 2022	
	% of deaths	Number of deaths	% of deaths	Number of deaths	% of deaths	Number of deaths
Deaths from unknown causes*						
Canada	<b>9.0%</b>	27,575	<b>7.1%</b>	22,030	<b>23.9%</b>	79,120
British Columbia	<b>8.3%</b>	3,920	<b>10.4%</b>	4,630	<b>8.3%</b>	3,810
Alberta	<b>8.4%</b>	2,440	<b>3.5%</b>	1,095	<b>12.4%</b>	4,050
Saskatchewan	<b>39.4%</b>	4,005	<b>3.9%</b>	435	<b>17.8%</b>	2,040
Manitoba	<b>30.3%</b>	3,205	<b>94.4%</b>	10,830	<b>99.8%</b>	5,020
Ontario	<b>6.4%</b>	7,430	<b>1.8%</b>	2,150	<b>40.4%</b>	47,150
Quebec	<b>2.4%</b>	1,740	<b>0.4%</b>	275	<b>1.6%</b>	1,210
New Brunswick	<b>10.8%</b>	835	<b>3.1%</b>	250	<b>12.6%</b>	1,165
Nova Scotia	<b>30.5%</b>	3,015	<b>19.5%</b>	1,990	<b>7.4%</b>	850
Prince Edward Island	<b>6.4%</b>	85	<b>8.4%</b>	120	<b>6.7%</b>	110
Newfoundland & Labrador	<b>3.8%</b>	205	<b>2.6%</b>	155	<b>15.8%</b>	1,015

While Canada’s public health authorities, government representatives, and most media have not been forthcoming with explanations for these recent excess deaths, some journalists have been pursuing the increase in excess deaths. Nonetheless, few answers have been provided by Statistics Canada or public health officials.

The *CBC* in New Brunswick headlined an article indicating that the spotlight for excess deaths is on “Covid-related heart attacks and strokes.” In the article, Colin Furness, an infection control epidemiologist, “...contends [that] provinces like New Brunswick need to study

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<sup>22</sup> “Table 13-10-0810-01 Provisional weekly death counts, by selected grouped causes of death,” Statistics Canada, June 7, 2021, June 9, 2022, and June 8, 2023, <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1310081001>. Note: “Ill-defined and unspecified causes” is a classification under the W.H.O. international system. Deaths can be re-classified to specific causes from this category with new data releases. “Information unavailable” is a clearing category used by Statistics Canada with no international classification code. Deaths are classified into specific causes from this category over time. The number of deaths classified into “information unavailable” is generally close to zero following the annual release of detailed cause of death data.

vascular-related deaths more closely, not just COVID deaths, to understand the virus's full body count." Somewhat in contrast to this opinion is the following e-mail statement from Sean Hatchard, Communications Officer for New Brunswick's Department of Health: "It wouldn't be prudent to link the analysis on excess deaths to specific medical conditions."<sup>23</sup>

The *CBC* in Nova Scotia headlines an article suggesting that Statistics Canada is offering an explanation for why "Nova Scotia is seeing 'significant' excess mortality," but the sub headline suggests otherwise: "COVID-19 is one reason, but agency says data is 'still very incomplete.'"<sup>24</sup> A spokesperson for Statistics Canada cites indirect impacts of the pandemic as a cause of excess deaths, "such as missed medical appointments or treatments, or cases—especially early in the pandemic—where individuals may have died from the virus prior to getting tested or treated." In the same article, the Nova Scotia government is reported as saying it "is confident its COVID death numbers are accurate." Statistics Canada singled out "'diseases of the heart' as another factor that may have contributed to excess mortality," but does not link this cause to COVID-19 and doesn't give a reason for the increase. The article goes on to quote infectious control epidemiologist, Colin Furnes, who said that "not only is COVID the number three killer [nationally], it's contributing to increases in the number one and the number two, which are cancer and cardiovascular."

These are suggestions about what *may* be causing unexpected deaths in Canada. The link to COVID-19 infection is a hypothesis made by an epidemiologist. Do the death certificates include mention of COVID-19 as a contributing factor? Statistics Canada receives and examines death certificate information that necessarily identify the underlying cause of death, if known, as well as contributing factors. A proper testing of the causal link suggested by Mr. Furnes is warranted.

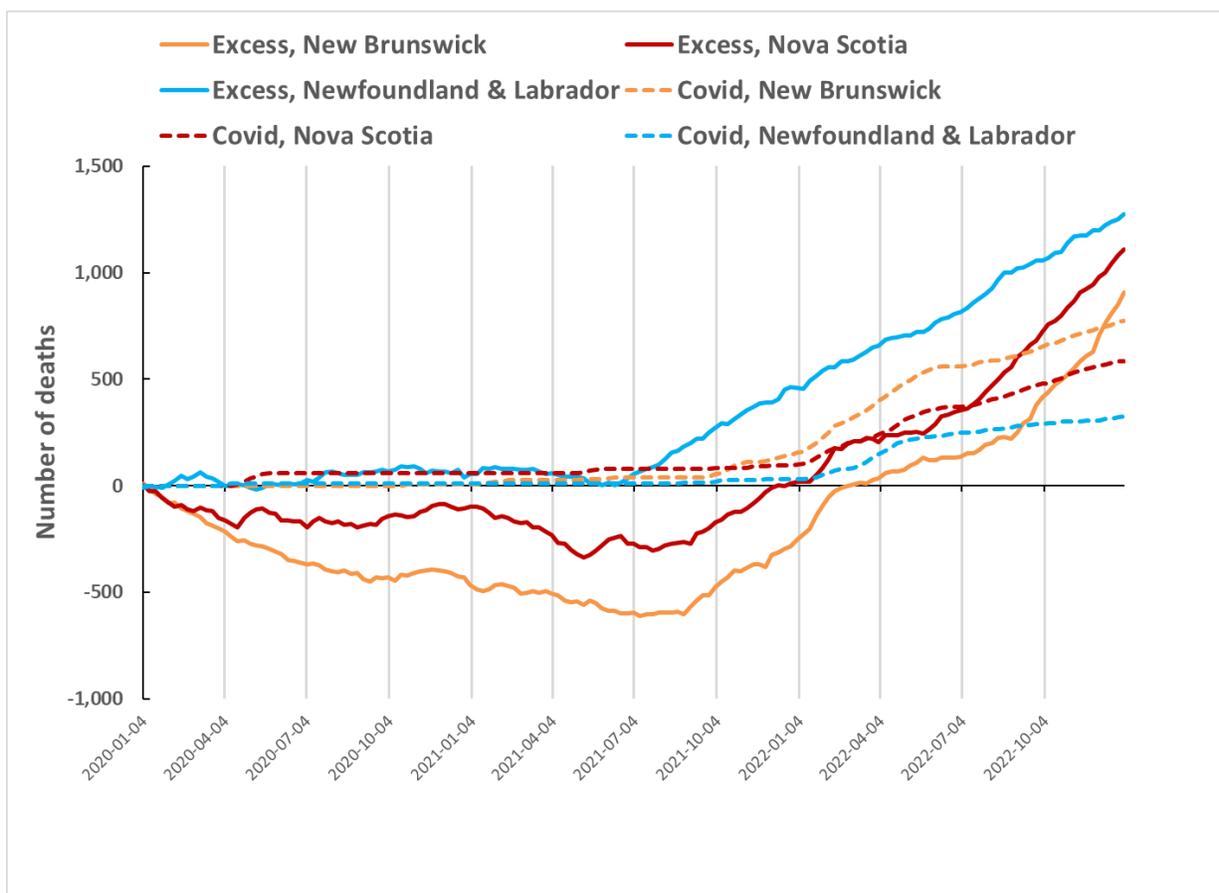
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<sup>23</sup> Robert Jones, "After N.B.'s deadliest year, COVID-related strokes and heart attacks are in the spotlight," *CBC*, May 18, 2023, <https://www.cbc.ca/news/canada/new-brunswick/record-covid-deaths-heart-stroke-1.6847211>.

<sup>24</sup> Richard Woodbury, "Why StatsCan says Nova Scotia is seeing 'significant' excess mortality," *CBC*, June 20, 2023, <https://www.cbc.ca/news/canada/nova-scotia/nova-scotia-excess-mortality-statistics-canada-1.6873755>.

**Figure 3 Cumulative excess and Covid deaths, Atlantic provinces (except P.E.I.)<sup>25</sup>  
New Brunswick, Nova Scotia, Newfoundland & Labrador 2020 - 2022**

The solid lines are the cumulative number of deaths considered to be "excess" ("adjusted" minus "expected").  
The dotted lines are the cumulative number of Covid deaths.  
Produced using Statistics Canada data and estimates (provisional).



For New Brunswick, Nova Scotia, and Newfoundland, reported deaths were below or near the expected number of deaths before mid-2021. Excess deaths were mostly negative and declining relative to expected deaths for the first year and a half of the pandemic. That trend

<sup>25</sup> "Table 13-10-0792-01. Provisional weekly estimates of the number of deaths, expected number of deaths and excess mortality, by age group and sex," Statistics Canada, June 8, 2023, <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1310079201>.

"Table 13-10-0810-01. Provisional weekly death counts, by selected grouped causes of death," Statistics Canada, August 8, 2023, <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1310081001>.

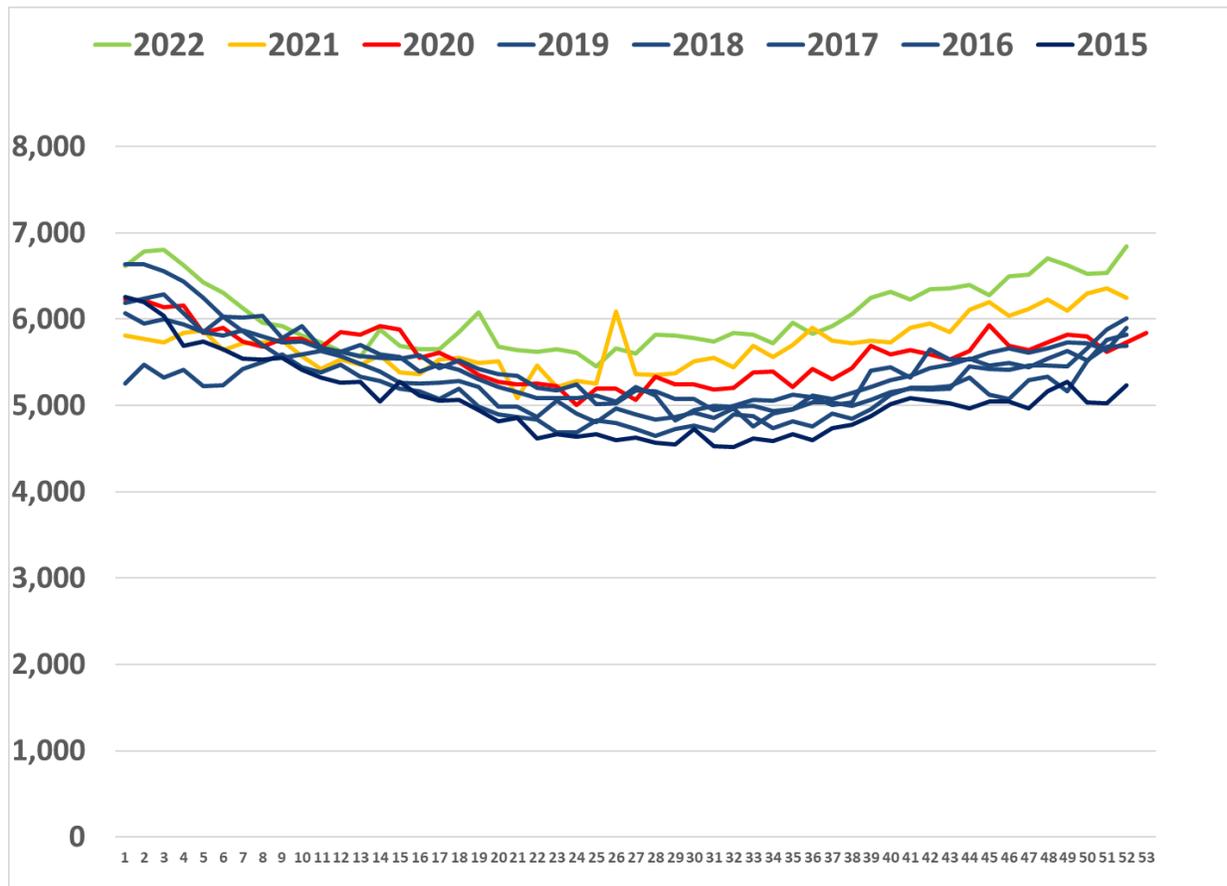
changed in the second and third quarters of 2021, when excess deaths became positive and reversed the downward, negative trend of cumulative excess deaths. Researchers such as those at Statistics Canada would normally notice the shift, investigate what may have caused this change, and conduct a statistical analysis to test a hypothesis. Instead, we are left with deaths from “unknown causes” and speculations. If this data gap remains unexplored, it will be difficult for public health authorities to justify future decisions or for the Canadian public to reasonably comply with them.

### **Non-COVID-19 deaths**

We saw earlier that, using cumulative mortality over the last three years (Figure 1), excess deaths are greater than the number of COVID-19 deaths. In Figure 6 (below) we see weekly deaths from all non-COVID-19 causes trending noticeably above the range observed from 2015 to 2019. This upward trend starts at the beginning of the second half of 2020, during widespread lockdowns. Non-COVID-19 deaths returned to normal levels early in 2021, but death rates are consistently above pre-pandemic ranges, beginning in the summer of 2021. The higher mortality levels are even more pronounced in 2022. (Note: the spike in July 2021 is attributable to heat-related deaths experienced primarily in British Columbia.)

**Figure 4 – Weekly deaths from all causes except COVID-19<sup>26</sup>  
Canada 2015 - 2022**

Non-COVID-19 deaths in 2022 (green)  
Compared to 2020 (red), 2021 (yellow), and 2015-2019 (dark blue).  
Produced using Statistics Canada data (2020-2022, provisional).



It would be helpful to have some details on what is causing these deaths, but the large numbers of deaths in the categories of “cause unknown” for the last three years makes cause-of-death data in recent reports unusable. The statisticians and experts responsible for providing useful cause of death data are failing to provide the timely, informative statistics that are necessary to finding out what is causing Canadians to die unexpectedly.

<sup>26</sup> Statistics Canada, “Provisional weekly death counts, by selected grouped causes of death.”

**Table 3 – Annual deaths from selected major causes, (52 weeks)<sup>27</sup>  
Canada 2010 - 2022**

*Produced using Statistics Canada data (2020-2022, provisional).*

	Total, all causes of death [A00-Y89]	Ill-defined and unspecified causes of mortality [R99]	Information unavailable	COVID-19 [U07.1, U07.2, U10.9]	Accidents (unintentional injuries) [V01-X59, Y85-Y86]	Alzheimer's disease [G30]	Cerebrovascular diseases [I60-I69]	Chronic lower respiratory diseases [J40-J47]	Diabetes mellitus [E10-E14]	Diseases of heart [I00-I09, I11, I13, I20-I51]	Influenza and pneumonia [J09-J18]	Intentional self-harm (suicide) [X60-X84, Y87.0]	Malignant neoplasms [C00-C97]	Nephritis, nephrotic syndrome and nephrosis [N00-N07, N17-N19, N25-N27]	All other causes of death
2010	239,615	1,240			10,845	6,420	13,690	10,730	6,945	48,625	5,110	3,940	71,680	3,855	56,485
2011	242,940	1,685			11,000	6,370	13,275	11,220	7,250	47,805	5,770	3,935	72,520	3,280	58,860
2012	245,245	1,105			11,275	6,260	13,120	11,035	6,975	48,365	5,610	3,995	74,020	3,295	60,265
2013	251,765	1,130			11,515	6,335	13,405	11,945	7,020	49,780	6,585	4,030	74,885	2,995	62,200
2014	257,710	1,195			11,750	6,410	13,495	11,825	7,050	50,830	6,420	4,270	76,805	3,095	64,625
2015	263,230	1,590			12,065	6,540	13,765	12,530	7,140	51,385	7,480	4,465	76,815	3,130	66,285
2016	266,050	1,895			13,500	6,495	13,535	12,240	6,825	51,550	6,210	4,435	78,715	3,025	67,675
2017	277,385	1,760			14,965	6,650	13,920	12,820	6,915	53,310	7,405	4,445	79,820	3,255	72,080
2018	284,840	3,755			15,420	6,455	13,500	13,025	6,835	54,020	8,595	4,540	79,530	3,600	75,615
2019	284,315	4,150			14,925	6,150	13,675	12,850	6,970	53,070	6,920	4,515	80,080	3,750	77,240
2020	305,505	9,190	470	15,500	15,415	5,720	13,650	11,710	7,520	53,480	6,000	3,850	80,575	4,020	78,475
2021	310,660	7,275	11,785	14,095	18,425	5,390	12,980	10,655	7,170	53,035	4,045	3,650	79,995	3,825	78,275
2022	331,165	11,655	67,465	16,280	12,265	4,575	11,265	10,105	6,040	45,060	4,610	2,455	66,855	3,425	69,030

## Impact of overreporting COVID-19 deaths

Early in 2020, the counter on COVID-19 deaths in Canada began. As of early June 2023, that number was estimated at 47,000 for 2020–2022. What does this number mean, and how reliable is it? The province of Québec is a good place to start looking.

Québec accounted for over 37 percent of total Canadian COVID-19 deaths to early June 2023, even though the population of Québec accounts for only 25 percent of Canada’s population aged over 65—the age demographic in which most COVID-19 deaths in Canada have been

<sup>27</sup> “Table 13-10-0810-01. Provisional weekly death counts, by selected grouped causes of death,” Statistics Canada, August 8, 2023, <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1310081001>. Note: “Ill-defined and unspecified causes” is a classification under the W.H.O. international system. Deaths can be re-classified to specific causes from this category with new data releases. “Information unavailable” is a clearing category used by Statistics Canada with no international classification code. Deaths are classified into specific causes from this category over time. It is generally close to zero following the annual release of detailed cause of death data.

observed. (Statistics Canada doesn't report on causes of death by age group until the annual data is released, but the Public Health Agency of Canada estimates that, based on 4.4. million cases, about 90 percent of COVID-19 deaths have been among people over age 60.)<sup>28</sup>

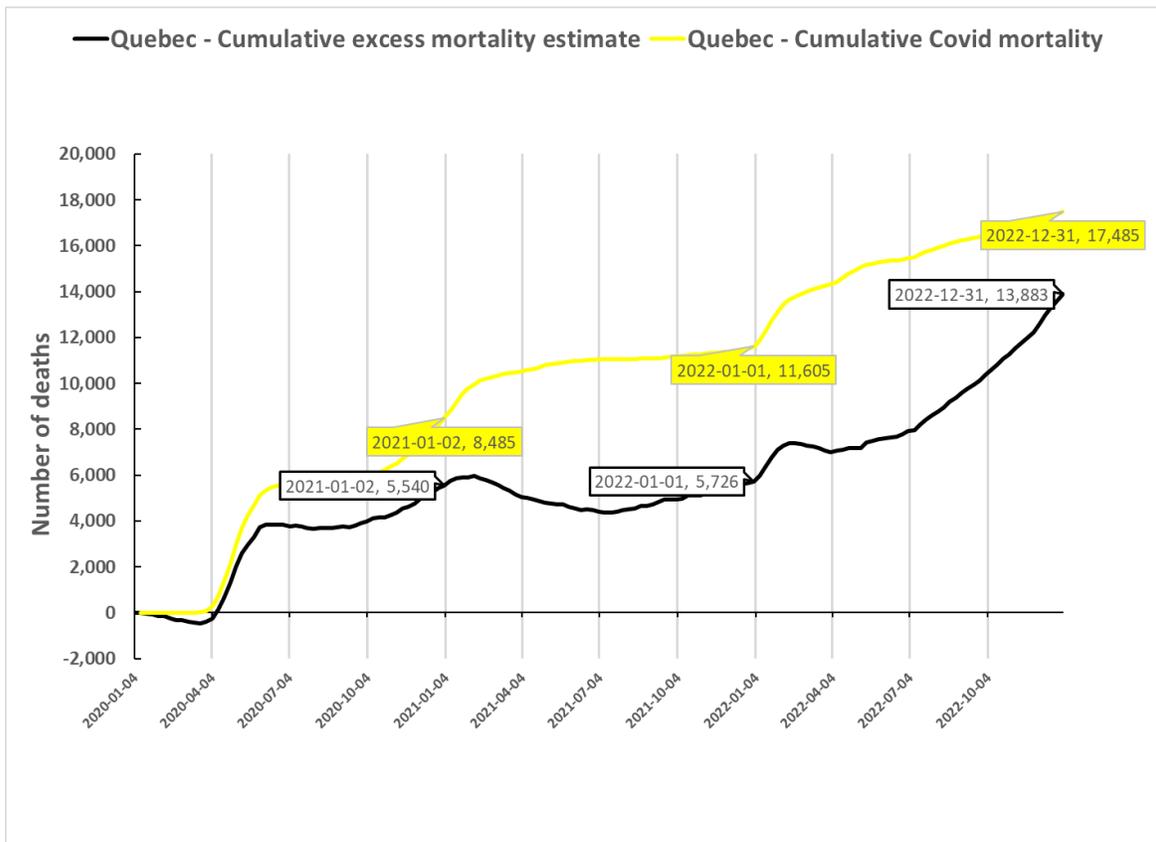
Statistics Canada has modeled weekly expected deaths for each year since the pandemic began in 2020 under the assumption that there was not a pandemic or severe influenza season. (This is demonstrated in the relatively low seasonal peaks for expected deaths in 2020 to 2022 as compared to the January peaks of actual deaths observed in 2017 and 2018 in Figure 2.) With COVID-19 as the primary cause of excess deaths, deaths from COVID-19 should roughly correspond to excess deaths over time. *In Québec, the largest contributor to Canada's death toll from COVID-19, we observe from Figure 7 below that the number of COVID-19 deaths is consistently higher than excess deaths.* This strongly suggests that many deaths attributed to COVID-19 were expected, even if a pandemic had not occurred. Because policy makers and public health officials focused almost exclusively on COVID-19 deaths throughout the pandemic (while providing little, if any, historical context), it would seem that the nature of the COVID-19 threat was exaggerated and that deaths from other causes were misrepresented.

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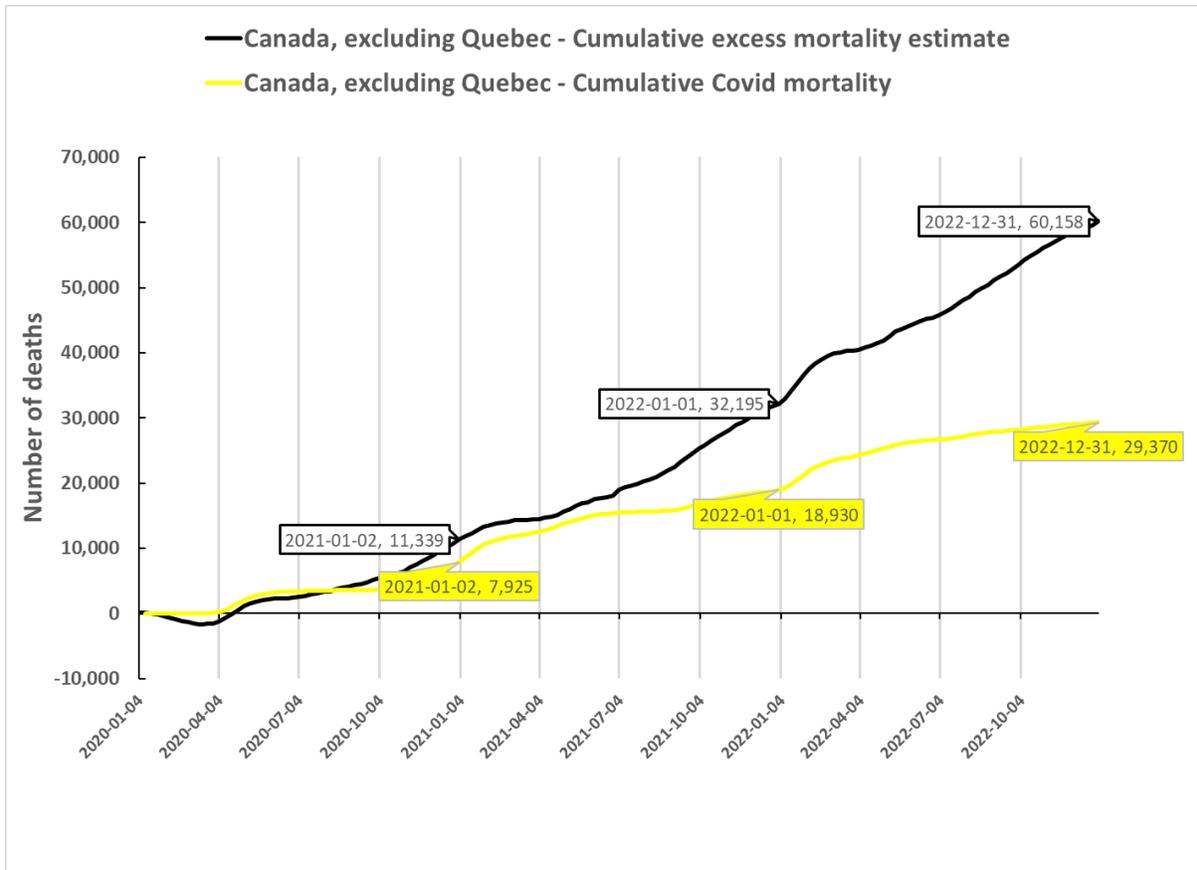
<sup>28</sup> "COVID-19 epidemiology update: Current situation," Government of Canada, Accessed August 8, 2023, [https://health-infobase.canada.ca/covid-19/current-situation.html?stat=num&measure=deaths\\_total&map=pt](https://health-infobase.canada.ca/covid-19/current-situation.html?stat=num&measure=deaths_total&map=pt). See also: Appendix A – COVID-19 deaths in Canada by age group.

**Figure 5 – Cumulative excess and COVID-19 deaths,<sup>29</sup>  
Québec and Canada excluding Québec 2020 – 2022**

The black line is the cumulative number of deaths considered to be “excess” (“adjusted” minus “expected”)  
The yellow line is the cumulative number of COVID-19 deaths. Statistics Canada estimates.  
Produced using Statistics Canada data (provisional).



<sup>29</sup> “Table 13-10-0810-01. Provisional weekly death counts, by selected grouped causes of death,” Statistics Canada, August 8, 2023, <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1310081001>. See also: “Table 13-10-0792-01. Provisional weekly estimates of the number of deaths, expected number of deaths and excess mortality, by age group and sex,” Statistics Canada, August 8, 2023, <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1310079201>.



It would be reasonable to ask whether other COVID-19 deaths in Québec would have been attributed to “normal” causes. To what extent have COVID-19 deaths been over-reported, including in other provinces where the discrepancy between COVID-19 and non-COVID-19 deaths is not so obvious? Statistics Canada acknowledged the potential for over-reporting of COVID-19 deaths in August 2020:

...this could be the result of the first wave of the virus disproportionately affecting vulnerable populations, some of whom may have been at high risk of dying in the subsequent months regardless of COVID-19.

There are other reasons why the number of excess deaths could be lower than the reported deaths due to the virus. These could include, for example, deaths wrongly

attributed to COVID-19. Not all deaths are necessarily linked to a test result, and someone could theoretically die of other causes even if they tested positive.<sup>30</sup>

Consistently over-attributing deaths to COVID-19 in Québec, where there have been 3,800 more COVID-19 deaths than excess deaths to the end of 2022, means that the number of non-COVID-19 excess deaths for the rest of Canada is likely understated.<sup>31</sup> Figure 1 suggests approximately 28,500 non-COVID-19 excess deaths in Canada, but, when Québec is excluded, that number rises to almost 30,800. It is impossible to know to what extent COVID-19 deaths were exaggerated in other provinces or how many excess deaths were caused primarily by COVID-19. We do know that, 18 months after years-end, Statistics Canada has not released detailed cause-of-death data, and almost a quarter of deaths in Canada are still from “unknown” causes.

What degree of trust can we place in the number of reported COVID-19 deaths—statistics that carried so much weight in driving policy decisions—when the causes of many deaths take months and years to determine? Where is the transparency? COVID-19 deaths can be declared publicly daily or weekly by public health authorities, but the cause of non-COVID-19 deaths require years to determine.<sup>32</sup>

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<sup>30</sup> Statistics Canada, “Excess mortality.”

<sup>31</sup> We are also reminded of the story of Nathanael Spitzer, a 14-year-old boy who had been diagnosed with stage four brain cancer. Two days before his death, he was diagnosed with COVID-19. The cause of his death was attributed to COVID-19, sparking controversy, and highlighting issues surrounding comorbidities and COVID-19 death reporting. The case of Nathanael is illustrative of a more widespread problem. How reporting bodies classify deaths from COVID-19 and other causes becomes data that impacts public policy decisions. (See: Wallis Snowdon, “Alberta’s reporting of comorbidities questioned after boy, 14, removed from COVID-19 death count,” *CBC*, October 15, 2021, <https://www.cbc.ca/news/canada/edmonton/covid-comorbidities-alberta-spitzer-1.6212510>.)

<sup>32</sup> Information on how Statistics Canada produces mortality databases can be found under Statistics Canada, Canadian Vital Statistics - Death database (CVSD). See: <https://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&SDDS=3233>.

## Deaths from COVID-19 vaccines?

The role of the COVID-19 vaccine in excess deaths is another area obscured by unavailable and insufficient information. Up to May 26, 2023, Health Canada reports that “a total of 442 reports with an outcome of death were reported following vaccination.”<sup>33</sup> There were over 55,000 reports of adverse events following COVID-19 vaccination that included over 6,200 events of “special interest” or that were considered serious in nature. According to the Health Canada website,

Of the 442 death reports, it was not possible to assess causality for 115 reports due to missing information (not enough information to initiate causality assessment).

...

Preliminary causality assessment was possible for the remaining 327 cases where there was sufficient information. Using the available information and the WHO guidance on causality assessment specific to vaccinations, we’ve determined that:

- 165 reports of death were unclassifiable due to lack of available information (not enough information to complete the preliminary assessment)
- 106 reports of death were inconsistent with causal association to the vaccine (unlikely to be linked to the vaccine)
- 52 reports of death were indeterminate (insufficient definitive evidence or conflicting evidence for causality)
- 4 deaths were consistent with causal association to immunization<sup>34</sup>

The majority of the 442 deaths reported by healthcare professionals, who completed the nine-page form outlining the circumstances of death and suggesting a link to the Covid vaccine,<sup>35</sup> were determined by either a provincial or federal health authority to lack sufficient supporting

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<sup>33</sup> “Canadian COVID-19 vaccination safety report,” Public Health Agency of Canada, June 9, 2023. <https://health-infobase.canada.ca/covid-19/vaccine-safety/>.

<sup>34</sup> See footnote 33.

<sup>35</sup> The public is instructed to ask a doctor, nurse, or pharmacist to report any adverse event; “death” as an outcome is an option on the form. See: “Adverse Events Following Immunization (AEFI) Reporting Form,” Public Health Agency of Canada, Accessed August 8, 2023, <https://www.canada.ca/en/public-health/services/immunization/reporting-adverse-events-following-immunization/form.html>. See also: “Report of adverse events following immunization (AEFI),” Public Health Agency of Canada, Accessed July 15, 2023, <https://www.canada.ca/content/dam/phac-aspc/documents/services/immunization/aefi-form-october-2021-eng.pdf>.

evidence or were missing information. Health Canada's final statement that, "if additional information becomes available, cases will be re-assessed, and the causality assessment may be updated," does not imply that follow-up, at least at the federal level, is pro-active.

Government health authorities identified the vaccine as the cause of death in fewer than one percent (n=4) of the 442 death reports that health care professionals had linked to the vaccine.

Late in 2021, doctors' concerns of serious reactions to COVID-19 boosters were not recognized as significant by politicians and public health authorities in Québec. Reports in December 2021 indicated that seniors at a publicly funded residence in Québec were experiencing adverse events after receiving the third dose of the COVID-19 vaccine. A co-deputy chief at the CIUSSS du Centre-Sud-de-l'Île-de-Montréal (a regional health and social services centre) raised concerns that seniors who were given COVID-19 boosters after recovering from a COVID-19 infection were suffering from "beaucoup beaucoup beaucoup d'effets secondaires" (or, "many many many side effects"), unlike those residents who received boosters but had not previously contracted COVID-19.<sup>36</sup>

Dr. Sophie Zhang highlighted symptoms such as fever, lethargy, difficulty breathing and lowered oxygen levels. The facility submitted the appropriate documentation of the adverse events to public health authorities. When asked if any deaths had been caused by the vaccine, Dr. Zhang said that since deaths can occur weekly at the seniors' residence, it was difficult to definitively attribute any deaths to the booster. Rather than reassuring the public that no deaths resulted from the COVID-19 booster, the response was essentially that cause of death is not easy to establish.

The Comité d'immunisation du Québec (Immunization Committee of Québec) subsequently recommended to health authorities in Québec that the third COVID-19 vaccine shots be delayed following recovery from a COVID-19 infection, ideally for three months but for at least

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<sup>36</sup> Marie-Eve Cousineau, "Une troisième dose de trop pour les aînés ayant eu la COVID-19," *Le Devoir*, December 4, 2021, <https://www.ledevoir.com/societe/sante/651882/pas-de-3-sup-e-sup-dose-pour-les-aines-ayant-eu-la-covid-19>.

eight weeks.<sup>37</sup> The committee argued that the booster was not needed so soon after recovery. However, in January 2022, the Québec government chose not to follow the advice of the committee and instead continued to pursue a quick roll-out of COVID-19 booster shots for everyone. It cited the lack of testing capacity and the impracticality of the accommodation, particularly since the Québec government was considering expanding the vaccine passport mandate to three vaccine shots. The administration of government mandates took priority over the recommendation of government-appointed health experts.

Seniors are the most highly vaccinated demographic in Canada,<sup>38</sup> yet mortality for the group in 2022 was at its highest level of the 2020-2022 period. Statistics Canada estimates that deaths among those aged 85 and over were 12.6 percent higher (n=13,540) than expected in 2022. Deaths in this age group were estimated to be 5.6 percent (n=6,010) and 3.1 percent (n=3,360) higher than expected in 2020 and 2021, respectively. Despite high vaccination rates and without any conclusive explanation, mortality among seniors worsened considerably in 2022.

## How does Canada compare to other countries in 2022?

In June 2022, the Canadian Medical Association Journal (CMAJ) released "Canada's response to the initial 2 years of the COVID-19 pandemic: a comparison with peer countries."<sup>39</sup> It concluded that:

Compared with the other Group of 10 (G10) countries, Canada performed better than most in terms of percentage of the population receiving 2 doses of a SARS-CoV-2 vaccine, and on measures assessing the direct effect of the pandemic: number of people infected, number who died from COVID-19 and total excess deaths.<sup>40</sup>

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<sup>37</sup> Vincent Larin, "Québec n'a pas écouté ses experts sur l'administration rapide d'une 3<sup>e</sup> dose aux infectés," *Le Journal de Québec*, January 22, 2022, <https://www.journaldequebec.com/2022/01/12/quebec-na-pas-ecoute-ses-experts-sur-ladministration-rapide-dune-3e-dose-aux-infectes>.

<sup>38</sup> See Appendix B for rates of COVID-19 vaccination in Canada.

<sup>39</sup> Fahad Razak, et al., "Canada's response to the initial 2 years of the COVID-19 pandemic: a comparison with peer countries," *CMAJ*, June 27, 2022, 194 (25) E870-E877; DOI: <https://doi.org/10.1503/cmaj.220316>.

<sup>40</sup> Razak, et al., "Canada's response."

While acknowledging shortcomings in some of the measures<sup>41</sup>, the CMAJ paper used cumulative excess deaths per million population, sourced from Our World In Data (OWID), to conclude that Canada performed favourably among the Group of 10 countries considered. It ranked second lowest only to Japan from March 2020 to October 2021 for excess deaths per million.

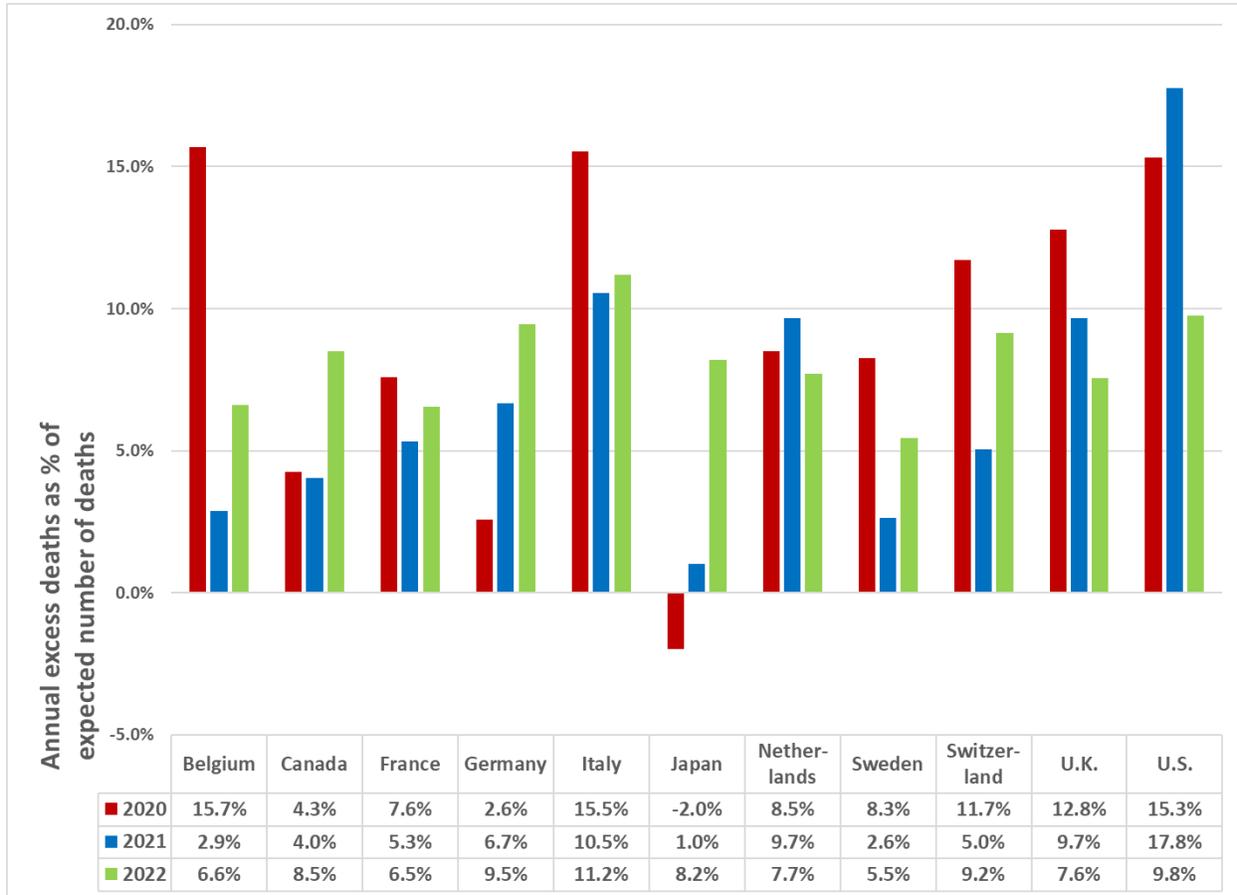
Excess deaths data to the end of 2022 is now available for Canada. We can summarize OWID data for the past three years for the countries considered in the CMAJ paper. Figure 9 below shows that seven of the countries considered, including Canada, had higher excess deaths as a percentage of the expected number of deaths in 2022 than in 2021. Canada ranked sixth highest in 2022. Rather than being at the low end for rates of excess deaths, as it had been during 2020-2021, Canada's relative performance deteriorated in 2022.

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<sup>41</sup> See "Reflection on the findings of the analysis" in the CMAJ paper above.

Figure 9 – Annual excess deaths as % of expected number of deaths<sup>42-43</sup>  
 Among selected countries (G10+) 2020 – 2022

Produced using Our World in Data dataset.



The OWID model for calculating expected deaths differs from the one used by Statistics Canada. OWID estimates higher levels of expected deaths and, as a result, lower levels of excess deaths than Statistics Canada. While the Statistics Canada model generates different rates of excess death than OWID estimates, Canada’s experience of increased rates of excess

<sup>42</sup> “Coronavirus (COVID-19) Deaths,” Our World in Data, Accessed June 6, 2023, <https://ourworldindata.org/covid-deaths>. See also: “Excess mortality during the Coronavirus pandemic (COVID-19),” Our World in Data, Accessed June 6, 2023, <https://ourworldindata.org/excess-mortality-covid?country=IND~USA~GBR~CAN~DEU~FRA>.

<sup>43</sup> The comparable rates of excess deaths for Canada using Statistics Canada excess death calculations are 5.7 percent, 7.2 percent, and 12.6 percent, for 2020, 2021 and 2022, respectively.

deaths in 2022 is observed in both models.

OWID analysis is a high-level dataset that can be useful for country comparisons, *but it fails to reveal variations among age groups and regions or explain causes of excess deaths.*

Canadians are lacking a detailed analysis of provincial experiences. The CMAJ paper focused on vaccine acceptance but failed to consider the question of why so many excess deaths are occurring among younger Canadians who are mostly unaffected by COVID-19. Why are there higher levels of excess deaths in 2022 after successful vaccination programs? (See Appendix B for rates of vaccination in Canada.)

## Conclusion

This report suggests that, now more than ever, Canadians need access to reliable and timely analyses about the causes behind excess deaths in Canada. Excess deaths in 2022 increased by an estimated 75 percent over 2021. Excess deaths continue to be high among an unusual demographic—persons under the age of 65. Twenty-four percent of 2022 deaths (n=approximately 79,000) have been classified as either “unknown cause” or “information unavailable,” compared to only 7 percent in 2021 and 9 percent in 2020.

During the COVID-19 pandemic, excess deaths were cited as a justification for closing medical facilities, businesses, recreational facilities, schools, universities, and places of worship. COVID-19 does not appear to be the only driver behind excess deaths, and rates of excess deaths accelerated in 2022. Canada is still experiencing an extraordinary medical situation. Deaths are deaths, whether they can be attributed to a novel virus or not. Canadian health authorities, politicians, and statistical agencies should pay attention and find answers. Specifically, they should have an interest in investigating the potential link between COVID-19 non-pharmaceutical and pharmaceutical interventions and excess deaths.

Democracy needs data. We cannot learn how best to approach future epidemiological events without knowing the cost and impacts of our response to the COVID-19 pandemic.

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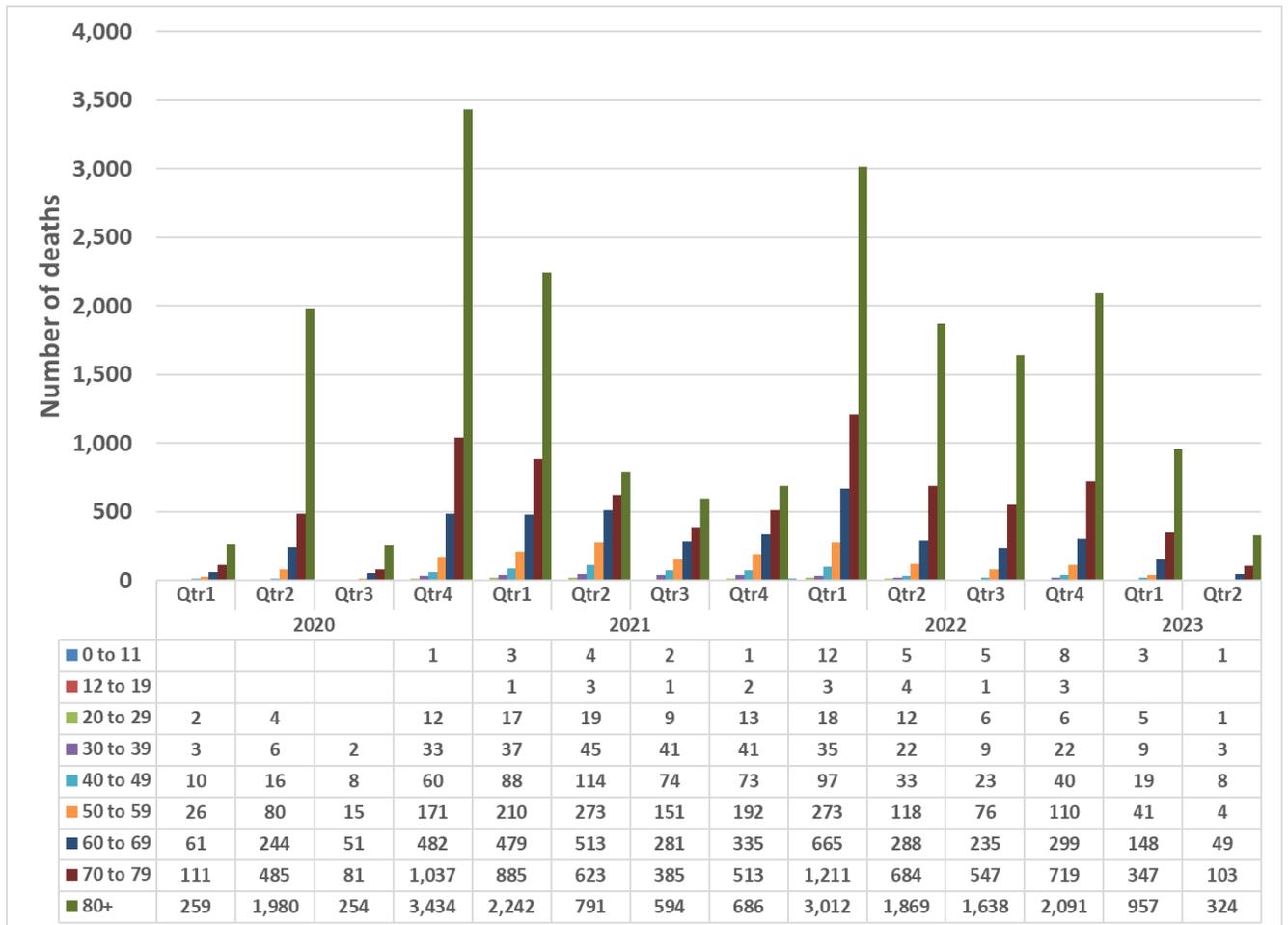
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# Appendix A - COVID-19 deaths by age group<sup>44</sup>

## CANADA

(Public Health Agency of Canada dataset of 4.4 million Covid cases\*)



<sup>44</sup> Government of Canada. "COVID-19 epidemiology update: Current situation," Accessed July 10, 2023.

[https://health-infobase.canada.ca/covid-19/current-situation.html?stat=num&measure=deaths\\_total&map=pt](https://health-infobase.canada.ca/covid-19/current-situation.html?stat=num&measure=deaths_total&map=pt).

\*Cases by age and gender: "We have detailed case report data from 4,395,404 cases. We know the age of patients in 99.9% of cases".

## Appendix B - COVID-19 vaccination in Canada by province

% of population "fully vaccinated" for COVID-19

	12-17	18-29	30-39	40-49	50-59	60-69	70-79	80+	All ages
<b>Canada</b>									
2021-03-06								7.1	1.5
2021-06-26	4.1	14.4	18.6	24.7	32.7	46.9	63.0	71.8	27.0
2021-09-25	73.6	70.8	73.1	79.4	83.7	88.2	91.0	91.0	70.2
2021-12-25	82.6	82.8	83.4	86.9	88.2	92.2	94.9	95.9	76.7
2022-03-27	82.4	83.7	83.9	87.2	90.5	91.5	92.7	94.8	79.9
<b>Alberta</b>									
2021-03-06								13.5	2.0
2021-06-26	6.2	15.6	21.0	30.1	39.1	59.1	75.8	81.8	29.1
2021-09-25	63.5	62.2	65.6	71.8	78.7	83.7	86.2	86.4	62.2
2021-12-25	77.8	79.0	79.8	83.4	86.6	89.6	92.5	94.7	71.8
2022-03-27	76.5	79.9	80.7	82.5	87.8	88.1	88.9	93.2	74.1
<b>British Columbia</b>									
2021-03-06								7.5	1.7
2021-06-26	0.6	11.0	15.2	22.1	28.0	41.2	65.8	74.2	25.3
2021-09-25	71.6	72.8	74.9	79.3	80.4	86.0	90.6	92.9	71.3
2021-12-25	83.8	87.3	85.7	87.0	85.2	89.5	93.6	97.0	78.3
2022-03-27	82.5	88.0	85.6	87.1	87.7	89.9	92.0	98.6	81.1
<b>Manitoba</b>									
2021-03-06								11.1	2.2
2021-06-26	5.6	21.4	28.3	34.2	41.2	51.7	70.8	83.2	31.5
2021-09-25	68.3	74.1	74.7	81.3	85.0	91.2	95.8	98.7	69.3
2021-12-25	79.7	84.7	82.8	87.2	88.8	93.4	97.3	-	74.7
2022-03-27	79.8	83.2	83.3	87.3	91.2	92.8	95.2	-	78.4
<b>New Brunswick</b>									
2021-03-06								3.4	1.5
2021-06-26	1.8	12.1	17.1	22.4	30.1	40.0	50.8	61.7	25.3
2021-09-25	69.2	66.3	69.2	77.5	82.5	88.6	92.7	93.2	70.7
2021-12-25	85.1	82.8	83.8	87.8	89.1	93.3	96.6	-	79.3
2022-03-27	82.6	79.2	81.8	88.0	90.7	92.9	94.7	-	81.1
<b>Newfoundland and Labrador</b>									
2021-03-06								4.4	1.8
2021-06-26	0.6	6.8	9.9	11.4	15.8	20.3	34.2	37.6	15.2
2021-09-25	77.6	69.0	75.5	82.6	85.4	90.5	91.8	89.0	74.4
2021-12-25	97.4	89.5	96.1	97.8	96.5	97.5	96.2	92.9	85.9
2022-03-27	95.0	89.1	96.5	-	97.4	97.9	96.9	-	90.8
<b>Nova Scotia</b>									
2021-03-06								2.5	1.5
2021-06-26	0.2	5.2	7.7	11.2	17.2	32.5	40.4	53.3	17.0
2021-09-25	75.0	67.8	72.8	81.1	86.3	90.6	92.4	93.1	72.8
2021-12-25	91.6	83.9	86.9	91.3	93.0	94.4	94.8	95.1	81.0
2022-03-27	94.0	81.6	84.9	92.1	96.7	93.3	91.3	89.9	83.3
<b>Ontario</b>									
2021-03-06								9.6	1.8
2021-06-26	5.0	17.4	21.8	27.7	35.3	46.4	59.9	68.4	28.1
2021-09-25	75.7	71.6	73.5	80.1	85.1	87.4	88.9	87.7	70.6
2021-12-25	81.8	82.1	83.1	86.8	88.9	92.1	93.8	93.5	76.6
2022-03-27	82.1	83.1	83.5	87.8	91.3	91.4	91.7	92.1	79.7
<b>Prince Edward Island</b>									
2021-03-06								18.4	3.4
2021-06-26	0.4	11.9	10.5	10.8	15.7	15.7	47.8	87.1	17.3
2021-09-25	76.4	69.1	77.9	82.6	89.3	94.1	92.3	93.9	73.7
2021-12-25	83.9	82.5	92.4	91.3	93.9	98.9	98.4	-	81.6
2022-03-27	84.1	78.2	90.3	91.4	94.8	98.1	95.6	-	84.0
<b>Quebec</b>									
2021-03-06									
2021-06-26	3.3	9.6	12.2	17.7	27.3	47.0	65.2	73.6	25.1
2021-09-25	80.3	74.3	76.7	82.7	85.9	92.0	95.5	95.5	73.8
2021-12-25	85.5	83.2	84.2	87.9	88.6	94.1	97.6	98.8	78.2
2022-03-27	85.8	85.4	85.4	88.2	91.1	93.5	95.3	95.5	82.1
<b>Saskatchewan</b>									
2021-03-06								13.8	2.3
2021-06-26	5.3	15.5	22.5	33.4	53.9	70.4	80.5	86.3	34.1
2021-09-25	61.0	59.6	64.9	72.0	77.7	84.6	88.2	91.0	61.3
2021-12-25	78.6	79.1	79.9	83.4	85.8	89.2	93.0	97.2	71.6
2022-03-27	78.1	80.7	81.1	82.9	88.6	88.9	90.0	-	75.5

Quebec's vaccination status categories changed on August 14, 2022. After that date, the "primary series completed" category for age groups from "18 to 29" to "80 and older" are not available for the province and Quebec is excluded at the national level. The "2nd booster dose" category only includes booster doses administered after August 14, 2022. Some provincial data are incomplete.

<https://health-infobase.canada.ca/covid-19/vaccination-coverage/>

Accessed July 10, 2023

### % of population "with first boosters" against COVID-19

	05-11	12-17	18-29	30-39	40-49	50-59	60-69	70-79	80+	All ages
<b>Canada</b>										
2022-06-19	0.1	17.6	34.9	42.6	52.1	63.4	75.6	83.7	87.3	48.1
2022-12-04	6.2	18.4	37.3	45.1	54.5	64.4	77.5	86.4	90.6	50.4
2023-03-26	7.6	19.3	37.3	45.4	54.8	64.2	78.1	87.6	92.6	50.9
<b>Alberta</b>										
2022-06-19	-	10.7	26.4	32.7	41.0	53.9	65.7	75.5	82.4	37.2
2022-12-04	4.3	15.8	28.2	34.3	43.0	55.1	68.3	79.5	85.7	39.5
2023-03-26	5.6	17.0	28.8	34.9	43.5	55.5	68.9	80.2	86.2	40.2
<b>British Columbia</b>										
2022-06-19	-	33.2	38.3	46.1	54.2	62.2	73.1	82.3	88.4	51.1
2022-12-04	16.7	36.9	40.4	48.7	56.7	63.9	76.2	86.4	95.5	54.8
2023-03-26	18.0	37.0	40.6	49.3	57.3	63.9	76.9	88.1	-	55.5
<b>Manitoba</b>										
2022-06-19	-	7.1	29.8	39.9	50.5	63.1	75.8	84.0	87.0	43.1
2022-12-04	5.1	13.5	30.8	41.3	52.2	64.0	77.9	87.5	90.7	45.3
2023-03-26	6.9	15.1	30.8	41.5	52.7	63.8	78.3	88.4	91.7	45.9
<b>New Brunswick</b>										
2022-06-19	-	16.9	27.1	35.3	48.2	63.3	76.5	85.3	89.0	48.8
2022-12-04	2.2	18.5	28.1	35.8	48.7	62.9	77.8	89.1	96.0	50.2
2023-03-26	3.6	18.5	28.2	35.6	48.5	62.4	78.0	90.7	-	50.7
<b>Newfoundland and Labrador</b>										
2022-06-19	-	9.9	40.5	50.6	62.5	71.0	79.9	86.0	88.4	56.7
2022-12-04	3.6	17.1	41.4	51.4	62.9	71.0	81.4	89.3	94.0	58.5
2023-03-26	5.7	17.5	38.8	49.7	61.6	69.6	82.3	94.5	-	59
<b>Nova Scotia</b>										
2022-06-19	-	10.8	31.5	43.6	55.7	68.6	80.3	87.9	91.4	52.1
2022-12-04	5.2	15.5	32.2	44.7	56.7	68.7	82.5	91.5	98.6	54.2
2023-03-26	7.6	17.4	32.1	45.0	56.8	68.1	83.1	93.1	-	54.9
<b>Ontario</b>										
2022-06-19	-	18.4	38.1	45.2	53.6	64.1	74.5	81.9	84.4	48.8
2022-12-04	5.6	21.1	39.1	46.7	55.0	64.6	76.7	84.9	87.2	50.7
2023-03-26	7.2	21.2	39.0	47.1	55.2	64.3	77.2	85.9	88.1	51
<b>Prince Edward Island</b>										
2022-06-19	-	13.6	26.0	40.9	51.5	66.7	81.8	87.0	94.5	48.6
2022-12-04	6.2	19.5	27.5	42.7	52.6	67.1	84.6	90.6	-	51.2
2023-03-26	8.4	20.7	27.6	42.9	52.6	66.7	85.1	92.5	-	51.9
<b>Quebec</b>										
2022-06-19	0.2	15.3	33.7	42.6	54.7	66.8	82.3	89.6	91.7	51.5
2022-12-04	3.6	5.8	40.4	48.3	59.9	68.8	82.9	90.1	92.4	53.9
2023-03-26	4.8	8.1	40.3	48.5	60.2	68.4	83.3	91.2	94.7	54.4
<b>Saskatchewan</b>										
2022-06-19	-	14.5	29.4	38.3	46.7	58.6	72.0	80.6	91.7	41.9
2022-12-04	6.2	17.6	30.3	39.3	48.4	58.8	73.7	84.3	97.3	44
2023-03-26	7.3	18.1	30.3	39.5	49.0	58.5	74.1	85.9	-	44.5

Quebec's vaccination status categories changed on August 14, 2022. After that date, the "primary series completed" category for age groups from "18 to 29" to "80 and older" are not available for the province and Quebec is excluded at the national level. The "2nd booster dose" category only includes booster doses administered after August 14, 2022. Some provincial data are incomplete.

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Accessed July 10, 2023