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Decomposing the decline in life expectancy at birth by cause of death during the COVID-19 pandemic in Canada

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Decomposing the decline in life expectancy at birth by cause of death during the COVID-19 pandemic in Canada

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Abstract

Background: Life expectancy at birth has increased in Organisation for Economic Co-operation and Development countries and across the globe over the past few decades, until 2019. However, this trend was disrupted by the COVID-19 pandemic, which saw a significant decrease in life expectancy in Canada and many other countries. Few studies to date have decomposed the life expectancy gap by cause of death observed during the pandemic in a Canadian context.

Data and Methods: Death counts were generated from the Canadian Vital Statistics - Death database. Life tables were created using Chiang's method. The Arriaga method for decomposing a life expectancy gap was implemented by comparing life tables between the periods of 2017 to 2019 and 2020 to 2022 by province and sex.

Results: COVID-19 was the single largest contributor to the life expectancy decline in Canada between the periods of 2017 to 2019 and 2020 to 2022, reducing life expectancy at birth by 0.46 years for both sexes. Opioid-related deaths, another significant contributor to the life expectancy decline, reduced life expectancy by 0.22 years for both sexes. By contrast, cancers contributed to a slight increase (+0.17 years) in life expectancy between the two periods.

Interpretations: Although COVID-19 was the most significant driving force in declining life expectancy during the pandemic in Canada, increased opioid-related deaths, potentially related to the indirect effects of the pandemic, also played a significant role in the notable life expectancy decline. A greater understanding of the indirect impacts of the COVID-19 pandemic in terms of mortality, including the harms related to substance use and abuse, will be possible as more information on the causes and circumstances of death is made available.

Keywords: life expectancy, COVID-19, cause of death, drug toxicity

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What is already known on this subject?

- Life expectancy began consistently declining for the first time in decades during the COVID-19 pandemic in Canada.
- Opioid-related mortality also began increasing during this time.

What does this study add?

- This study quantifies the number of years each cause of death contributed to the life expectancy decline in Canada by province and sex.
- COVID-19 was the largest contributor to the life expectancy decline in Canada, with opioid-related deaths also being a significant contributor.
- The extent of the contribution of opioid-related deaths remains unknown without more updated cause of death data.

Introduction

Life expectancy at birth is defined as the average number of years an individual is expected to live from birth, assuming age-specific mortality conditions remain constant. Generally, life expectancy at birth has trended upward in Organisation for Economic Co-operation and Development countries since the 1970s because of reductions in mortality arising from improvements in health care, disease prevention, and a variety of socioeconomic conditions.¹ Additionally, global life expectancy has also increased significantly from 2000 to 2019, attributable to reductions in maternal and infant mortality.² However, the COVID-19 pandemic reversed these trends across the globe in more recent years.^{2,3} Canada was no exception and experienced a decline in life expectancy at birth from 2019 to 2022, going from 82.30 years to 81.34 years.⁴

The driving forces behind the sharp decline in life expectancy during the pandemic should be investigated. It is known that the COVID-19 virus was associated with an increased risk of mortality for individuals with certain comorbidities, with 90% of reported deaths caused by COVID-19 occurring among those with other illnesses, such as diabetes, cardiovascular disease, obesity, and chronic respiratory illnesses.^{5,6} Few studies^{7,8} to date have attempted to quantify the impact of COVID-19 and related comorbidities on life expectancy in the Canadian context. In addition to the direct effects of the pandemic, the indirect effects—such as health care disruptions—led to delayed interventions or screening for cancers, cardiovascular events, and infections, and these have also not been well explored in the context of life expectancy.⁹⁻¹¹

The ongoing opioid crisis, which saw a significant increase in opioid mortality starting in 2016,¹² contributed significantly to the stagnation in life expectancy experienced in Canada prior to the pandemic.¹³ The crisis was exacerbated during the pandemic, with opioid-related deaths more than doubling from 3,007 in 2019 to 6,222 in 2021.¹⁴ Public health measures, such as physical distancing and self-isolation, disrupted access to essential harm reduction services and treatment programs, thus increasing the challenges faced by those with substance use concerns and mental illness.¹⁵ The impact of opioid-related deaths on life expectancy in Canada has been documented before the pandemic; however, the effect of causes of death other than COVID-19 on life expectancy during the pandemic has not been widely studied.

The purpose of this study was to identify and quantify the causes of death that contributed to the decline in life expectancy at birth during the COVID-19 pandemic. As well, the causes of death that positively contributed to life expectancy over this same period were examined for contextual purposes. This was done by decomposing the life expectancy difference by cause of death between a pandemic and pre-pandemic time point using the Arriaga method for decomposition.¹⁶ Additionally, results by province and sex at birth were explored, given it is unlikely that COVID-19, opioid-related deaths, and all other relevant causes of death had a uniform impact on life expectancy at birth across demographic groups.

Data and methods

Data sources

The data used in the present analysis consist of all deaths that occurred in Canada from 2017 to 2022, taken from the Canadian Vital Statistics - Death database (CVSD). Underlying cause of death was defined using the 10th revision of the International Statistical Classification of Diseases and Related Health Problems (ICD-10). Underlying cause of death groups were created based on the top 53 underlying causes of death currently published at Statistics Canada with minor modifications,¹⁷ which can be found in Appendix Table 1. The first change was the aggregation of the Alzheimer's disease and dementia grouping. The most notable exception was in the categorization of opioid-related deaths, which additionally used multiple cause of death data that specify the type of substance involved in the death. This is because the underlying cause of death codes alone do not isolate opioid-related deaths. Lastly, the ICD-10 group "other ill-defined and unspecified causes of mortality" (R99) was also added outside the traditional groupings. Cause of death imputation was done for R99 cases in the CVSD that had a corresponding case in the Canadian Coroner and Medical Examiner Database (CCMED). Cases with a manner of death in the CCMED that is suspected to be suicide or homicide were imputed as "intentional self-harm (suicide)" and "assault (homicide)," respectively, instead of R99. Population estimates used to compute life expectancy were taken from Statistics Canada's mid-year population estimates.¹⁸

Life tables

Estimates of life expectancy at birth were obtained from complete life tables computed using the methods described by Chiang (1961).^{19,20} The life tables used single-year age groups, and the open-ended age groups were set to 100 years or older. Death counts and population estimates were aggregated across two distinct periods—2017 to 2019 and 2020 to 2022—to form a pre-pandemic and pandemic period, respectively. Estimates were produced for each of the Canadian provinces by sex at birth. The territories were excluded from subnational disaggregation because of their small population size. The difference in life expectancy was calculated by subtracting life expectancy at birth between the two time points. Then, 95% confidence intervals (CIs) were computed for the life expectancy difference estimates by adding the variances associated with the two life expectancy estimates, with the assumption of independent variances.⁸

Decomposition of the life expectancy difference

The life expectancy differential between the pre-pandemic and pandemic periods was decomposed using the Arriaga (1984) method.¹⁶ Although various life expectancy decomposition methods exist, such as those of Pollard (1982) and Lopez and Ruzicka (1977), all have shown to produce comparable results.²¹ In short, Arriaga's method begins by partitioning the life expectancy differential by age group. This is done by quantifying and then summing the direct, indirect, and interaction effects, which are the three different effects that an age group can have on a life expectancy differential, to get the net years each

age group has contributed to the change in life expectancy.¹⁶ The age-specific contributions are then further partitioned by cause of death. This is done assuming that changes in life expectancy attributable to a specific age group, for a particular cause of death, are directly proportional to the changes in the overall mortality rate for that same age group that can be attributed to a change in mortality for that cause of death. In other words, at a specific age, a change in mortality for a specific cause of death results in a change in the overall mortality rate that then causes a direct change in life expectancy.^{22,23} The age- and cause-specific contributions to the life expectancy differential are then summed by cause of death to provide the net contribution to the life expectancy differential (in years) for each cause of death.

Results

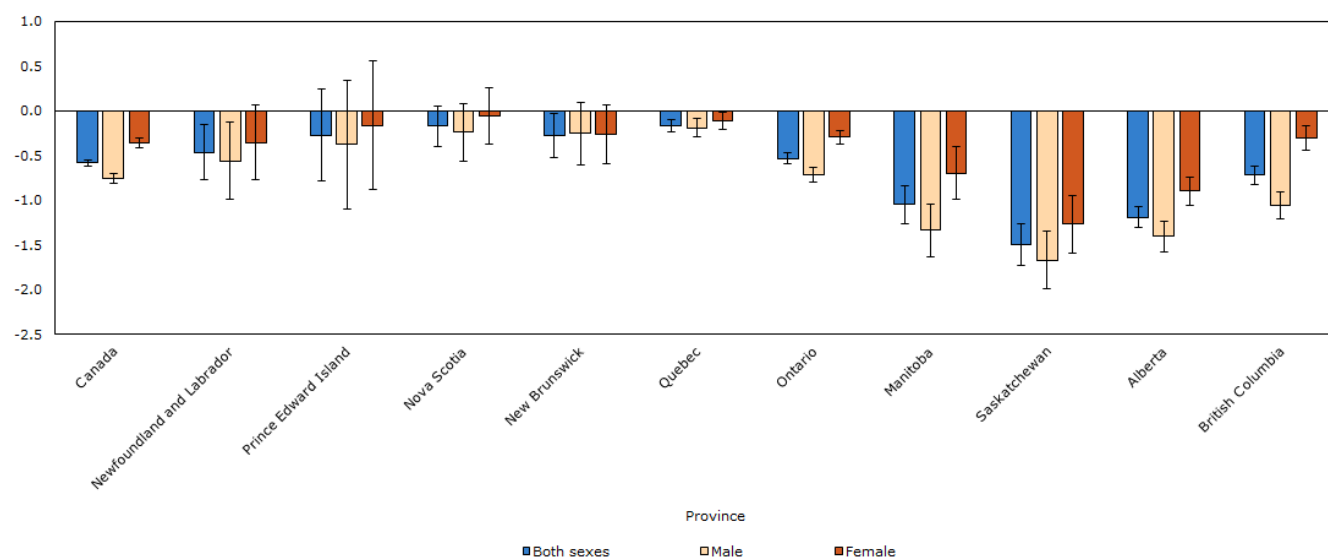
Life expectancy difference by province and sex

At the national level, life expectancy at birth declined by 0.58 years (95% CI: 0.55 to 0.62) between 2017 to 2019 and 2020 to 2022 for both sexes. Life expectancy also decreased across all provinces. A larger magnitude of life expectancy declines was observed in the Prairie provinces (Manitoba, Saskatchewan, and Alberta) and British Columbia, compared with other provinces, ranging from 0.72 years (95% CI: 0.62 to 0.82) in British Columbia to 1.50 years (95% CI: 1.27 to 1.73) in Saskatchewan for both sexes (Chart 1). The Atlantic provinces (Newfoundland and Labrador, Prince Edward Island, Nova Scotia, and New Brunswick) experienced some of the smallest magnitudes of declines relative to the other provinces. The life expectancy decrease of males appeared to have a larger magnitude, compared with that of females, across the provinces, except for New Brunswick.

Chart 1

Difference in life expectancy at birth between 2017 to 2019 and 2020 to 2022 by province and sex, with 95% confidence intervals

life expectancy difference (years)



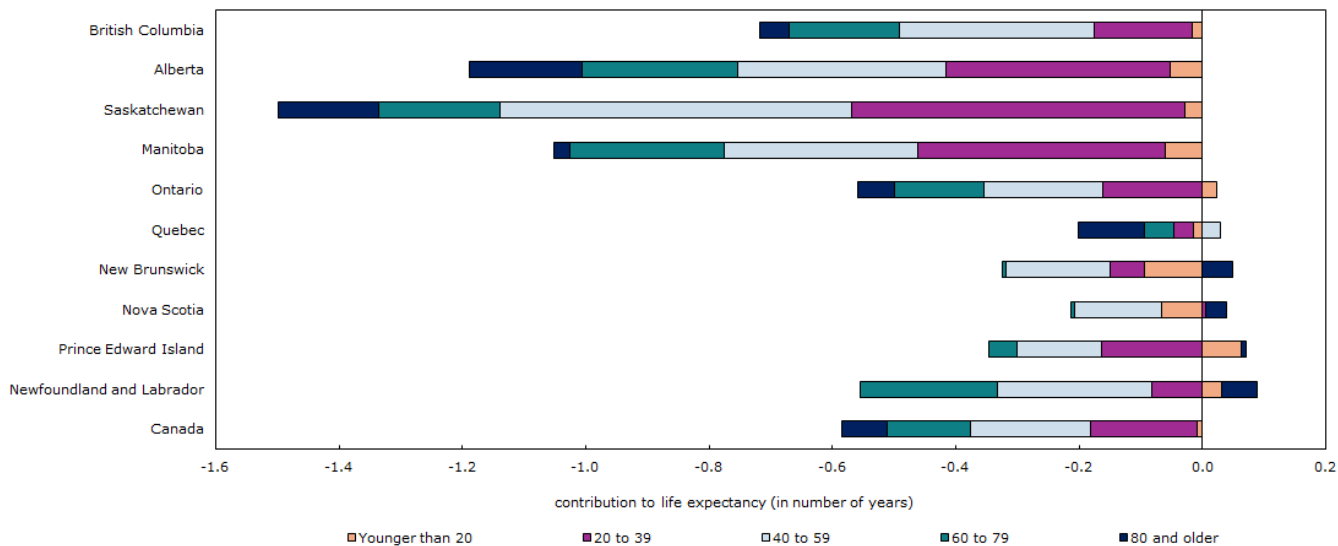
Source: Statistics Canada, Canadian Vital Statistics - Death database, February 2025.

Life expectancy difference by age

The age-specific contributions to the life expectancy differential were aggregated using five groups of 20-year age categories, with the exception of individuals younger than 20, who comprised the first group, and individuals aged 80 and older who comprised last group, as shown in Chart 2. At the national level,

the largest negative contribution to the life expectancy differential was the 40 to 59 age group, which reduced life expectancy by 0.19 years, followed by the 20 to 39 age group, which reduced life expectancy by 0.17 years. Ontario, British Columbia, and the Prairie provinces showed mostly proportional age-specific contributions to Canada. However, Quebec and the Atlantic provinces showed an overall less consistent trend, with some of the older age groups contributing to an increase in life expectancy in the Atlantic provinces.

Chart 2
Difference in life expectancy at birth between 2017 to 2019 and 2020 to 2022 by age group and province



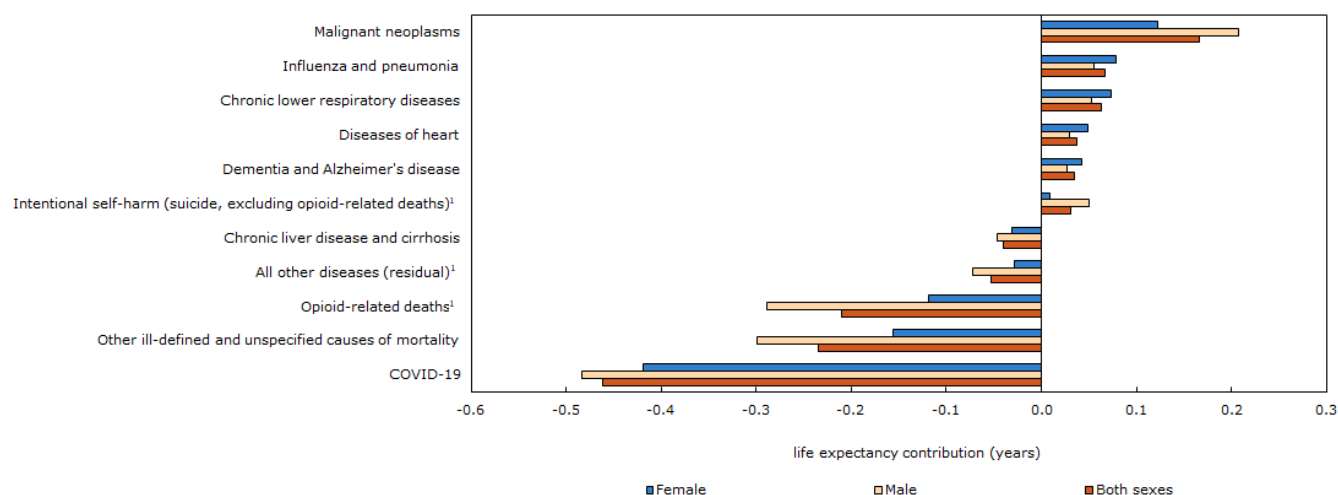
Source: Statistics Canada, Canadian Vital Statistics - Death database, February 2025.

Life expectancy difference by cause

COVID-19 was the single largest contributor to the life expectancy decline in Canada observed between the periods of 2017 to 2019 and 2020 to 2022, reducing life expectancy at birth by 0.46 years for both sexes. Chart 3 shows that the next largest contributors to the life expectancy decline were other ill-defined and unspecified causes of mortality and opioid-related deaths, which reduced life expectancy by 0.23 years and 0.21 years, respectively. For context, other ill-defined and unspecified causes of mortality are mostly cases where the cause of death is currently pending investigation (see the section on limitations for more information).

Chart 3
Contributors to difference in life expectancy at birth among top causes of death between 2017 to 2019 and 2020 to 2022 by sex, Canada

Underlying cause of death



1. Denotes a cause of death that may still have a significant number of cases pending investigation currently classified as other ill-defined and unspecified causes of mortality (see the limitations section for more information).

Notes: Opioid-related deaths include any case where opioids are listed as a contributing cause of death. Opioids supercede the listed underlying cause of death. Only causes of death with a life expectancy contribution above 0.01 years or below -0.01 years are shown in Figure 3, although the full results with the top 53 causes of death are available in the appendix (Table 1).

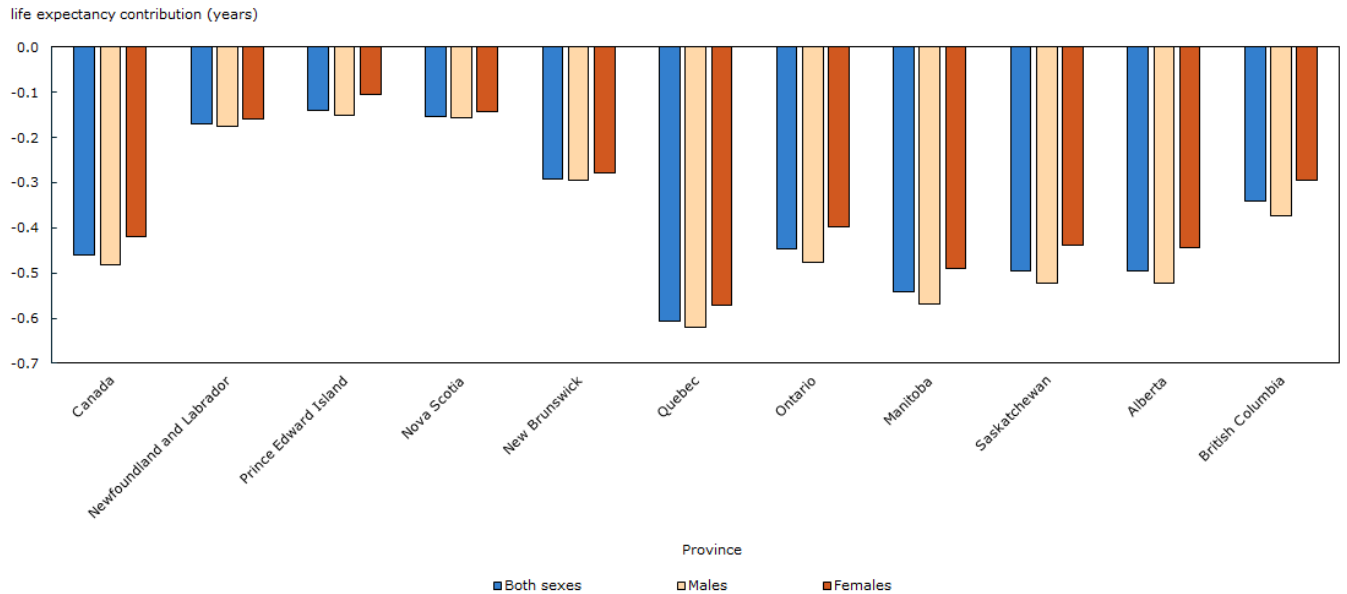
Source: Statistics Canada, Canadian Vital Statistics - Death database, February 2025.

By contrast, the underlying causes of death that contributed to an increase in life expectancy were malignant neoplasms (+0.17 years), influenza and pneumonia (+0.07 years), and chronic lower respiratory diseases (+0.06 years). Although not shown in Chart 3, lung, bronchus, and trachea cancers were the largest contributors to an increase in life expectancy among cancers, increasing life expectancy by 0.09 years.

In terms of differences between the sexes, among positive contributors, there were minor differences between males and females, except for intentional self-harm (suicide), which saw a larger positive contribution for males (see the section on limitations for more context). Among negative contributors, COVID-19 had minor differences in contributions between the sexes, while opioid-related deaths and other ill-defined and unspecified causes of mortality contributed to much larger reductions in life expectancy in males (0.29 and 0.30 years, respectively), compared with females (0.12 and 0.16 years, respectively).

Across the provinces, the contribution of COVID-19 to the life expectancy decline was largest in Quebec, where it reduced life expectancy by 0.61 years for both sexes, as shown in Chart 4. Overall, contributions from COVID-19 were relatively close to the national estimates in the Prairie provinces, British Columbia, and Ontario, ranging from a decrease of 0.34 years in British Columbia to a decrease of 0.54 years in Manitoba. The Atlantic provinces saw notably smaller contributions from COVID-19, ranging from a decrease of 0.14 years in Prince Edward Island to a decrease of 0.30 years in New Brunswick. There were small differences in life expectancy contributions from COVID-19 by sex across the provinces, with slightly higher contributions from males, compared with females.

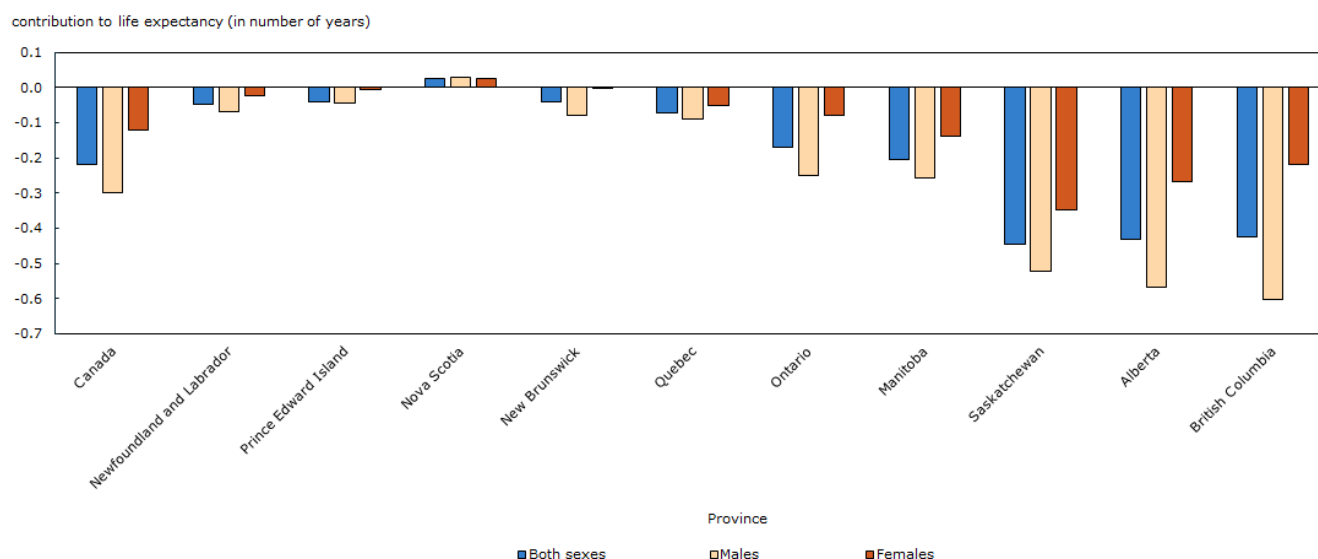
Chart 4
Contribution of COVID-19 to difference in life expectancy at birth between 2017 to 2019 and 2020 to 2022 by province and sex



Source: Statistics Canada, Canadian Vital Statistics - Death database, February 2025.

Chart 5 shows that the contribution of opioid-related deaths to the life expectancy decline was lowest in Quebec and the Atlantic provinces, with opioid-related deaths increasing life expectancy in Nova Scotia. The largest negative contributions of opioid-related deaths were seen in Saskatchewan, Alberta, and British Columbia, which all experienced a reduction between 0.42 to 0.44 years of life expectancy for both sexes. The sex disparities in the life expectancy contribution of opioid-related deaths were mostly consistent across the provinces, with the most pronounced among them in Ontario, Alberta, Saskatchewan, and British Columbia. Males had consistently larger negative life expectancy contributions attributable to opioid-related deaths than females, with the largest disparity observed in British Columbia, which saw a reduction of 0.60 years of life expectancy among males, compared with a reduction of 0.22 years among females.

Chart 5
Contribution of opioid-related deaths to difference in life expectancy at birth between 2017 to 2019 and 2020 to 2022 by province and sex



Note: Opioid-related deaths include any case where opioids are listed as a contributing cause of death. Opioids supercede the listed underlying cause of death.
Source: Statistics Canada, Canadian Vital Statistics - Death database, February 2025.

Discussion

Life expectancy in Canada declined by 0.96 years from 2019 to 2022, during the pandemic.⁴ Although this was a mostly global phenomenon, these impacts were not experienced uniformly, with comparable countries like England and Wales (-0.5 years), Sweden (+0.08 years), and the United States (-1.04 years) observing life expectancy changes during that same period.²⁴ The primary aim of this analysis was to identify the causes of death contributing to the decline in Canadian life expectancy observed during the COVID-19 pandemic. The results showed that COVID-19 was the largest negative contributor to the life expectancy decline, followed by other ill-defined and unspecified causes of mortality, and opioid-related deaths. Additionally, cancers were the largest positive contributors to life expectancy during this period.

It has been well established that traditional life table estimates, and life expectancy in general, tend to be impacted to a larger degree by deaths in younger age groups rather than older age groups. Although COVID-19 claimed 50,322 lives in Canada from 2020 to 2022,¹⁷ 80% of deaths caused by COVID-19 occurred in individuals aged 70 and older,²⁵ potentially mitigating the impact COVID-19 can have on life expectancy. However, the sheer number of deaths attributable to COVID-19 was the primary driver of declining life expectancy during this period. Various factors may explain differences in the contribution of COVID-19 to the life expectancy decline across Canada, reflecting not only specific pandemic dynamics, like population density and volume of travel, but also different public health measures implemented at the provincial level.²⁶ In contrast to Quebec, Ontario, and the Prairie provinces, the Atlantic provinces experienced fewer COVID-19 cases and deaths during the initial spread of the pandemic because of early public health interventions and restricted travel.²⁷ This likely translated into the relatively smaller negative contributions to life expectancy for COVID-19 observed in the Atlantic provinces, compared with the other provinces.

COVID-19 disproportionately impacts older individuals with multiple comorbidities. Some of the most common comorbidities with COVID-19 mortality among all age groups observed at different stages of the pandemic include dementia or Alzheimer's disease, pneumonia, and chronic lower respiratory diseases.^{6,28} Given the population at risk, it is very likely that a certain proportion of the estimated life

expectancy differential attributable to COVID-19 is a result of displaced mortality, which is a phenomenon where an acute public health event harvests deaths from other causes that would have likely occurred in the near future.²⁸ For example, chronic lower respiratory diseases such as chronic obstructive pulmonary disease (COPD) are established comorbidities of COVID-19 mortality.²⁸ COPD and influenza and pneumonia also contributed positively to the life expectancy differential for Canada, COPD's contribution being potentially driven by mortality displacement. However, because influenza and pneumonia are communicable diseases like COVID-19, this decrease is likely a combination of mortality displacement and a real mortality decrease resulting from the indirect effects of public health measures taken to reduce the spread of COVID-19.²⁹ Similarly, decreasing lung cancer incidence and mortality rates in recent years, as well as improved survival, are likely the main driver in cancers being the largest contributor to an increase in life expectancy.³⁰ The literature suggests that the indirect effects of the pandemic may have impacted cancer diagnosis and treatment,³⁰⁻³² although those impacts may not be fully captured in this analysis.

Opioid-related deaths were the third-largest contributor to the life expectancy decline in Canada. Opioid-related mortality has been a growing issue in Canada over the last decade and was exacerbated during the pandemic.¹⁴ Overall, the results are consistent with historical opioid-related regional and age-specific trends in Canada—British Columbia, the Prairies, and Ontario are the most impacted regions.¹⁴ British Columbia, the province with the highest rate of opioid-related mortality,³³ was the only province to experience a larger negative contribution from opioid-related deaths than COVID-19 for both sexes, and this is consistent with findings from a similar study.⁷

Historically, life expectancy at birth has traditionally been higher for females compared with their male counterparts in Canada, although the disparity has fluctuated over time.³⁴ Chart 4 shows the differences by sex in net and cause-specific life expectancy and indicates that the life expectancy gap between males and females increased during the pandemic. For context, the life expectancy gap between males and females grew from 4.21 years in 2019 to 4.48 years in 2022.⁴ The contribution of COVID-19 and all other causes of death (residual) to the life expectancy differential showed modest differences between males and females. However, opioid-related deaths and other ill-defined and unspecified causes of mortality had the largest differences in life expectancy contribution between the sexes. This suggests that these two causes of death are the primary drivers in the increasing life expectancy gap between males and females observed during the pandemic.

Despite COVID-19 being the single largest contributor to the life expectancy decline during the pandemic, it is important to note the potential indirect effects that COVID-19 and the public health measures that followed it may have had. Opioid support and mitigation programs were significantly disrupted during the pandemic, resulting in increased opioid use with fewer supports in Canada.³⁵ Globally, feelings of anxiety and isolation also contributed to increased substance use.¹⁴ The lack of access to services and isolation, paired with an increased toxic drug supply, played a part in explaining why opioid-related deaths in Canada increased sharply during the pandemic.¹⁴ Furthermore, with a sizable proportion of deaths still pending investigation and currently classified in the other ill-defined and unspecified causes of mortality group, the negative contribution of opioid-related deaths to life expectancy is very likely larger and could potentially be comparable to that of COVID-19. Further research is needed to understand the direct impact the pandemic had on opioid use and mortality among various demographic groups.

Limitations

The primary limitation associated with this study is related to the process through which death records are sent from provincial and territorial vital statistics registries to Statistics Canada and eventually recorded in the CVSD. Although almost all records are received within a year from the date of death, the causes of death are not always sent with this initial notification. These delays can vary greatly by province and territory. Around 82% of other ill-defined and unspecified causes of mortality from 2020 to 2022 are

cases that are pending a coroner's investigation or where no medical certificate of cause of death has been received (also likely implying a pending investigation), with only a small proportion having been finalized as an unknown or ill-defined cause of death. In addition to delays, there can also be differences in how deaths are certified by coroners in Canada, particularly in the case of COVID-19, and this is explained further by O'Brien et al.⁶

This limitation can result in an underestimation of the life expectancy contribution of causes of death that require a coroner's investigation, such as opioid-related deaths, suicides, homicides, and other types of accidents. Pending investigations were more likely to be resolved in the pre-pandemic period (2017 to 2019) than the more recent pandemic period (2020 to 2022). This temporal bias results in underestimated death counts for certain causes of death in recent years, translating into a positive inflation in the contribution to the life expectancy difference for these causes of death. As these pending investigations are eventually resolved with time, the large negative contribution to the change in life expectancy associated with other ill-defined and unspecified causes of mortality will eventually be redistributed among opioid-related deaths, suicides, homicides, and other types of accidents. In the absence of more updated cause of death data, the true extent of the contribution of opioid-related deaths and suicides to life expectancy is unknown.

Arriaga's method for decomposition has the potential to underestimate the magnitude of contributions of causes of death that primarily affect older age groups. This is a natural result of the method by which the age-specific decomposition is computed.³⁶ However, the overall differences in estimates between the Arriaga method and others such as the Pollard (1982) method appear minute.³⁷

Conclusion

The life expectancy decomposition presented here demonstrates the role of COVID-19 and opioid-related deaths in the notable decline in life expectancy during the pandemic and the differential impact across sexes and provinces in Canada. By contrast, cancers and causes of death associated with COVID-19 mortality displacement were some of the largest positive contributors to the life expectancy gap and mitigated some of the losses observed from other causes. Stark changes in life expectancy attributable to opioid-related deaths in this analysis may be associated with the indirect effects of the pandemic, although this is not easily measurable. Questions remain about the true extent of the contribution of opioid-related deaths, which will likely have a larger negative contribution to life expectancy when more updated and timely data are available.

Appendix

Appendix Table 1
Net life expectancy contributions for top 53 grouped causes of death by sex, Canada

Grouped cause	ICD code	Life expectancy contribution (years)		
		Male	Female	Both sexes
Salmonella infections	A01-A02	0.0000	0.0000	0.0000
Shigellosis and amoebiasis	A03, A06	-0.0001	0.0001	0.0000
Tuberculosis	A16-A19	-0.0005	-0.0019	-0.0012
Scarlet fever and erysipelas	A38, A46	0.0000	0.0000	0.0000
Meningococcal infection	A39	-0.0003	0.0002	0.0000
Sepsis	A40-A41	0.0046	0.0064	0.0055
Syphilis	A50-A53	-0.0004	0.0000	-0.0002
Acute poliomyelitis	A80	0.0000	0.0000	0.0000
Arthropod-borne viral encephalitis	A83-A84, A85.2	0.0000	-0.0001	0.0000
Measles	B05	0.0001	0.0000	0.0001
Viral hepatitis	B15-B19	0.0061	0.0043	0.0053
Human immunodeficiency virus [HIV] disease	B20-B24	-0.0001	-0.0002	-0.0002
Malaria	B50-B54	0.0000	0.0000	0.0000
Malignant neoplasms	C00-C97	0.2069	0.1225	0.1658
In situ neoplasms, benign neoplasms, and neoplasms of uncertain or unknown behaviour	D00-D48	-0.0010	0.0022	0.0004
Anaemias	D50-D64	-0.0004	-0.0015	-0.0009
Diabetes mellitus	E10-E14	-0.0043	-0.0063	-0.0055
Nutritional deficiencies	E40-E64	-0.0014	-0.0016	-0.0015
Meningitis	G00, G03	0.0000	0.0011	0.0006
Parkinson's disease	G20-G21	-0.0020	-0.0029	-0.0029
Dementia and Alzheimer's disease	F00-F03, G30	0.0267	0.0422	0.0350
Diseases of heart	I00-I09, I11, I13, I20-I51	0.0296	0.0485	0.0368
Essential (primary) hypertension and hypertensive renal disease	I10, I12, I15	-0.0068	-0.0093	-0.0081
Cerebrovascular diseases	I60-I69	0.0182	0.0246	0.0218
Atherosclerosis	I70	0.0019	0.0031	0.0025
Aortic aneurysm and dissection	I71	0.0040	0.0037	0.0038
Influenza and pneumonia	J09-J18	0.0556	0.0791	0.0675
Acute bronchitis and bronchiolitis	J20-J21	0.0009	0.0007	0.0008
Chronic lower respiratory diseases	J40-J47	0.0527	0.0740	0.0629
Pneumoconioses and chemical effects	J60-J66, J68	0.0002	-0.0004	-0.0001
Pneumonitis due to solids and liquids	J69	-0.0068	-0.0029	-0.0052
Peptic ulcer	K25-K28	-0.0036	-0.0010	-0.0024
Diseases of appendix	K35-K38	-0.0002	0.0001	0.0000
Hernia	K40-K46	-0.0003	-0.0013	-0.0008
Chronic liver disease and cirrhosis	K70, K73-K74	-0.0471	-0.0306	-0.0397
Cholelithiasis and other disorders of gallbladder	K80-K82	-0.0035	-0.0008	-0.0023
Nephritis, nephrotic syndrome and nephrosis	N00-N07, N17-N19, N25-N27	-0.0088	-0.0055	-0.0076
Infections of kidney	N10-N12, N13.6, N15.1	-0.0014	-0.0007	-0.0011
Hyperplasia of prostate	N40	-0.0020	0.0000	-0.0012
Inflammatory diseases of female pelvic organs	N70-N76	0.0000	-0.0013	-0.0006
Pregnancy, childbirth and the puerperium	O00-O99	0.0000	-0.0004	-0.0002
Certain conditions originating in the perinatal period	P00-P96	0.0060	0.0029	0.0045
Congenital malformations, deformations and chromosomal abnormalities	Q00-Q99	0.0064	0.0062	0.0064
COVID-19	U07.1, U07.2, U10.9	-0.4831	-0.4195	-0.4612
Opioid-related deaths ¹	F11, T401-T404, T406	-0.2892	-0.1188	-0.2106
Accidents (unintentional injuries) ¹	V01-X59, Y85-Y86	0.0272	0.0001	0.0138
Intentional self-harm (suicide) ¹	X60-X84, Y87.0	0.0505	0.0085	0.0311
Assault (homicide) ¹	X85-Y09, Y87.1	-0.0104	0.0004	-0.0054
Legal intervention	Y35, Y89.0	0.0002	0.0002	0.0002
Operations of war and their sequelae	Y36, Y89.1	0.0000	0.0000	0.0000
Complications of medical and surgical care	U12.9, Y40-Y84, Y88	-0.0025	-0.0012	-0.0019
Other ill-defined and unspecified causes of mortality	R99	-0.2990	-0.1564	-0.2343
All other diseases (residual)	...	-0.0724	-0.0290	-0.0532
... not applicable				

1. Denotes a cause of death that may still have a significant number of cases pending investigation currently classified as other ill-defined and unspecified causes of mortality (see the limitations section for more information).

Notes: ICD = International Statistical Classification of Diseases and Related Health Problems. The assault (homicide) and intentional self-harm (suicide) cause of death categories received imputations from the Canadian Coroner and Medical Examiner Database for instances where the underlying cause is unknown. Opioid-related deaths include any case where opioids are listed as a contributing cause of death. Opioids supercede the listed underlying cause of death.

Source: Statistics Canada, Canadian Vital Statistics - Death database, February 2025.

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