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Circumstances surrounding fire-related deaths among Indigenous people in Canada, 2011 to 2020

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Overview of the study

Fire-associated morbidity and mortality represent the fourth most common cause of unintentional injuries worldwide, affecting millions of lives.¹ In Canada, an average of 220 fire-related deaths have occurred each year from 2011 to 2020.² In the Canadian context, fire-related mortality and morbidity were found to be significantly higher among Indigenous people (First Nations, Métis, and Inuit) – particularly among First Nations people and Inuit – when compared to non-Indigenous people.³

The objective of this study is to analyze and compare available data on the circumstances surrounding fire-related deaths among Indigenous people to those among non-Indigenous people.

This study uses data from the Canadian Coroner and Medical Examiner Database (CCMED) and the Canadian Vital Statistics - Death database (CVSD) linked to the 2006 and 2016 Census of Population and the 2011 National Household Survey (NHS). According to the 2016 Census of Population, Indigenous people accounted for 4.9% of the total Canadian population, up from 4.3% in 2011 and 3.8% in 2006.^{4,5,6} Of the 2,200 fire-related deaths reported in the CCMED known to have occurred in Canada from 2011 to 2020, over 700 death records linked to the censuses and NHS.

- Among the sample of 700 individuals who had died by fire and who had previously been enumerated in at least one of the two censuses (2006 or 2016) or the National Household Survey (2011), 140 (20%) were Indigenous (First Nations, Métis, and Inuit), a proportion about four times higher than their share of the population.
- Fire-related fatalities were more prevalent among males than females for both Indigenous and non-Indigenous people.
- Indigenous people who died from a fire-related event from 2011 to 2020 were younger on average (mean age of 39 years) compared to non-Indigenous people who died in a fire (mean age of 59 years).
- Fire-related deaths were most common in the winter months for both Indigenous and non-Indigenous people.
- Residential fires accounted for the majority of fire-related deaths among both Indigenous and non-Indigenous people.
- About 1 in 8 (12%) residential fire-related deaths among Indigenous people occurred in residences without a working smoke alarm and this was similar for non-Indigenous residential fire-related deaths.

- About 56% of Indigenous people who died in a residential fire lived in a house that needed major repairs compared with 13% of non-Indigenous people.
- Indigenous people (20%) who died in a residential fire were more often involved in residential fires causing two or more deaths than non-Indigenous people (7%).
- Over two-thirds (68%) of Indigenous people who died in a fire lived in rural areas compared with one-third (34%) of non-Indigenous people who died in a fire.

Introduction

Fire-associated morbidity and mortality represent the fourth most common cause of unintentional injuries worldwide, affecting millions of lives.¹ In Canada, an average of 220 fire-related deaths occurred each year between 2011 and 2020.² In the Canadian context, however, fire-related mortality and morbidity were found to be significantly higher among Indigenous people (First Nations, Métis, and Inuit). This particularly applies for First Nations people and Inuit compared to non-Indigenous people living in private dwellings in Canada.³

Recent studies have shown that the mortality rate from all fires among First Nations people between 2011 and 2018 was five times higher (rate ratioⁱ (RR) = 5.2) compared with non-Indigenous people. Among Inuit, the mortality rate was 17 times higher (RR = 17.3). Specifically, the age-standardizedⁱⁱ fire-related mortality rate was 1.6, 0.6 and 5.3 deaths per 100,000 person-years at risk among First Nations people, Métis, and Inuit, respectively, compared to 0.3 among non-Indigenous people.³

A British Columbia-based study found that between 1991 and 2001, Indigenous fire-related deaths were nine times higher among Status Indians compared to other residents of the province. Mortality rates were found to be particularly high among children younger than 5 years of age and seniors aged 65 years and older.⁷

There are many factors that are thought to contribute to higher fire-related mortality among Indigenous people. Specifically, inadequate housing, lack of smoke detectors, underfunding of fire services in Indigenous communities, poverty, and lack of legislation mandating adherence to building and fire codes on reserve are all factors that have been suggested to increase risk of fire-related death⁸. In addition, multiple factors such as lower socioeconomic status (low educational attainment, low income, unemployment, etc.), overcrowded living conditions, and limited access to healthcare services in rural locations place Indigenous people at an elevated risk of various types of unintentional injuries including fire-related morbidity and mortality.^{9,10,11}

According to the *Ontario Chief Coroner's Table on understanding fire deaths in First Nations*, education and prevention are key to reducing fire fatalities. This includes providing appropriate education on topics like fire escape, fire safety and resource and facility maintenance. In addition, providing funding

ⁱA rate ratio is a relative measure used to compare rates between two populations. In the cited study, the rate ratio was defined as the ratio of the mortality rate among Indigenous people to the mortality rate among non-Indigenous people.

ⁱⁱ The age standardized mortality rate is a weighted average of the age-specific mortality rates per 100 000 persons-years at risk of the event in question.

to communities to help with training and education of how to use, install and maintain smoke alarms, including the provision of suitable smoke alarms in accordance with the type of heating sources used.¹²

Although several studies have attempted to explore fire-related mortality and morbidity among Indigenous people in Canada, information gaps remain. The aim of this study is to analyze, summarize and compare the circumstances surrounding fire-related deaths experienced by Indigenous people who died in a fire to those of non-Indigenous people.

Data from the Canadian Coroner and Medical Examiner Database (CCMED) and the Canadian Vital Statistics – Death database (CVSD) were linked to the 2006 and 2016 Census of Population and the 2011 National Household Survey (NHS), to produce a sample of individuals who died in a fire between 2011 and 2020 in Canada. The section [Data sources and methodology](#) includes detailed information on the data sources, the linkage process and indicators considered for analysis. The section also presents important limitations which should be considered when interpreting the findings. This report was prepared for and sponsored by the National Indigenous Fire Safety Council (NIFSC), which is funded by Indigenous Services Canada.

Results

Between 2011 and 2020, there were over 2,200 fire-related deaths reported in the CCMED. The CCMED includes data from all provinces and territories except for Manitoba. Of the 2,200 fire-related deaths, 32% (700) of the deceased individuals had a death record that could be linked to at least one of the three sample surveys (i.e., 700 fire-related death records linked to a record from the 2006 and/or 2016 Census of Population and/or the 2011 NHS). It is this sub-sample of fire-related deaths that is the focus of the following analysis. Of the 700 people who died from a fire-related event, 140 people (20%) identified as Indigenous in one of the sample surveys, a proportion about four times higher than their share of the population, suggesting an overrepresentation of Indigenous people in the linked dataset. According to the 2016 Census of Population, Indigenous people accounted for 4.9% of the total Canadian population, up from 4.3% in 2011 and 3.8% in 2006.^{4,5,6}

The linked dataset may not be representative of all fire-related deaths in Canada because of the relatively low linkage rate (32%) and because Indigenous people are over-represented among Census of Population and NHS respondentsⁱⁱⁱ. However, to assess linkage bias, the distribution of select variables from the linked dataset (i.e., 700 fire-related deaths) was compared to the distribution for the total population of fire-related deaths in CCMED (i.e., 2,200 fire-related deaths) and was found to be comparable (see APPENDIX 1). The comparable distributions between the two datasets suggests a potential lack of linkage bias in the linked dataset.

In the following sections, the term ‘linked dataset’ will be used to refer to the 700 CCMED fire-related death records that linked to the 2006 or 2016 Census of Population or the 2011 NHS.

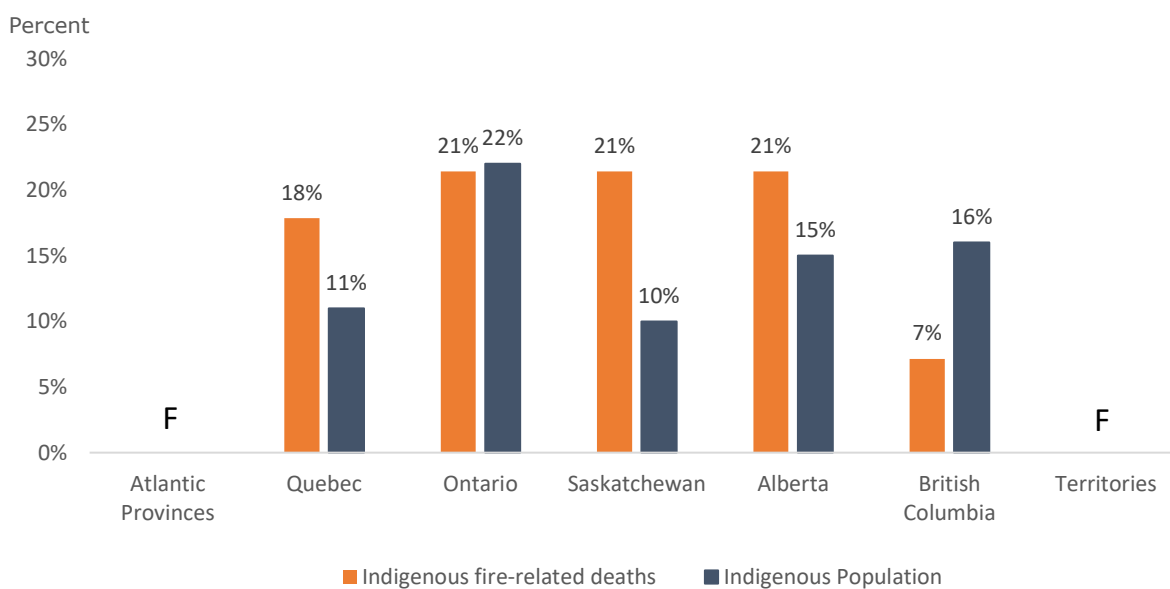
ⁱⁱⁱ 100% of households on reserve and/or in the territories were sampled for the Census of Population and NHS compared to 20-30% of households off reserve in the provinces.

Provincial Overview

According to the 2016 Census of Population, the distribution of Indigenous people living in Canada varied by Province and Territory. While the distribution of fire-related deaths among Indigenous people also varied, it was not comparable to the Indigenous population distribution (Chart 1).

The proportion of fire-related deaths among Indigenous people was greater than the proportion of the Indigenous population in Alberta (21% of Indigenous deaths versus 15% of the Indigenous population), Quebec (18% versus 11%), and Saskatchewan (21% versus 10%), suggesting an overrepresentation of fire-related deaths in these Provinces. Underrepresentation was observed in British Columbia (7% versus 16%), where the proportion of fire-related deaths among Indigenous people was 2.3 times lower than its share of the Indigenous population. In Ontario, the proportion of Indigenous fire-related deaths (21%) was similar to the Indigenous population proportion (22%). Fire-related deaths for Manitoba were not available in the linked dataset and death proportions for Atlantic Canada and the Territories were suppressed to meet Statistics Canada's confidentiality requirements.

Chart 1
Distribution of Indigenous fire-related deaths compared to the distribution of the Indigenous population, 2011 – 2020



Notes: Data for Manitoba were not available in the linked dataset. Data for the Atlantic Provinces and Territories were suppressed to meet Statistics Canada's confidentiality requirements.

Source: Statistics Canada, linked dataset integrating the 2006 and

Who is at greatest risk?

Fire-related fatalities were more common among males

For both Indigenous and non-Indigenous populations from the linked dataset, fire-related fatalities were more prevalent among males than females. Approximately 3 in 5 (61%) individuals who died in a fire were male, and 2 in 5 (39%) were female.

Fire-related fatalities were most common among younger Indigenous people

The age distribution of fire-related fatalities from the linked dataset varied by population group. Indigenous people who died from a fire-related event were younger on average (mean age of 39 years) compared to non-Indigenous people (mean age of 59 years).

From 2011 to 2020, 75% of Indigenous people who died in a fire were younger than 55 compared to 37% of non-Indigenous people. The difference was even more notable among those aged 0 to 14 and 25 to 34 years, where the proportion of fire-related deaths was 3 to 4 times higher among Indigenous people in these age groups compared to non-Indigenous people (Chart 2).

Of note, the Indigenous population is younger than the non-Indigenous population. According to the 2016 Census of Population, 83% of Indigenous people were younger than 55, compared with 69% of non-Indigenous people.⁴

According to a previous Statistics Canada analysis on fire-related deaths in Canada, seniors were at greater risk of fire-related death than their younger counterparts.² This finding is consistent with the trend for non-Indigenous people. Among non-Indigenous people who died in a fire, the proportion of deaths involving seniors was greater than any other age group and more than three times higher than among Indigenous seniors (14%).

Chart 2
Proportion of fire-related deaths among Indigenous and non-Indigenous people, by age group, Canada, 2011 to 2020



Notes: 'Age' refers to age at death. No weights were used in calculating these estimates.

Source: Statistics Canada, linked dataset integrating the 2006 and 2016 Census of Population, the 2011 National Household Survey and the Canadian Vital Statistics - Death database (2011-2020) with the Canadian Coroner and Medical Examiner Database (2011 to 2020).

What is happening? – Manner and cause of fire-related deaths

Most fire-related deaths were classified as accidents

In Canada, most fire-related deaths were classified as unintentional (accidents).² From 2011 to 2020, 82% of deaths from the linked dataset were classified as unintentional among Indigenous people who died in a fire, compared with 77% among non-Indigenous people. The proportion of fire-related deaths classified as suicide was two times lower among Indigenous people (7%) than among non-Indigenous people (16%). Other manners of death (e.g., homicide, undetermined) accounted for 11% of deaths among Indigenous people who died in a fire and 7% among non-Indigenous people.

Most fire-related deaths were a result of smoke inhalation

Most fire-related deaths in Canada were the result of smoke inhalation.² This finding was true for both Indigenous and non-Indigenous people. Among Indigenous people who died in a fire, over two-thirds (68%) of deaths were a result of smoke inhalation alone, while 14% were due to burns alone and 14% were caused by both smoke inhalation and burns. Among non-Indigenous people who died in a fire, the patterns were similar (60% due to smoke inhalation alone, 24% due to burns alone, and 9% due to smoke inhalation and burns). A small percentage of fire-related deaths among both population groups were due to blunt force trauma from a jump, fall or falling debris, or had causes of death which were unknown or unspecified.

What are the other factors or circumstances surrounding fire-related deaths?

The coroner or medical examiner may include additional circumstance information in the reports submitted to the CCMED, but the level of detail provided in the report varies by death investigator and by jurisdiction. In some cases, the circumstance information is very limited.

In addition to providing information on demographics and causes of death, the findings more commonly reported by coroners and medical examiners investigating fire-related deaths include the date of death, the location of the fire, the source of ignition, and presence of working smoke alarms.

The presence of a risk factor is considered "not specified" when the information is missing from the coroner or medical examiner report, while the absence of a risk factor can only be considered when the coroner or medical examiner has indicated that a given factor was not present or involved in the death.

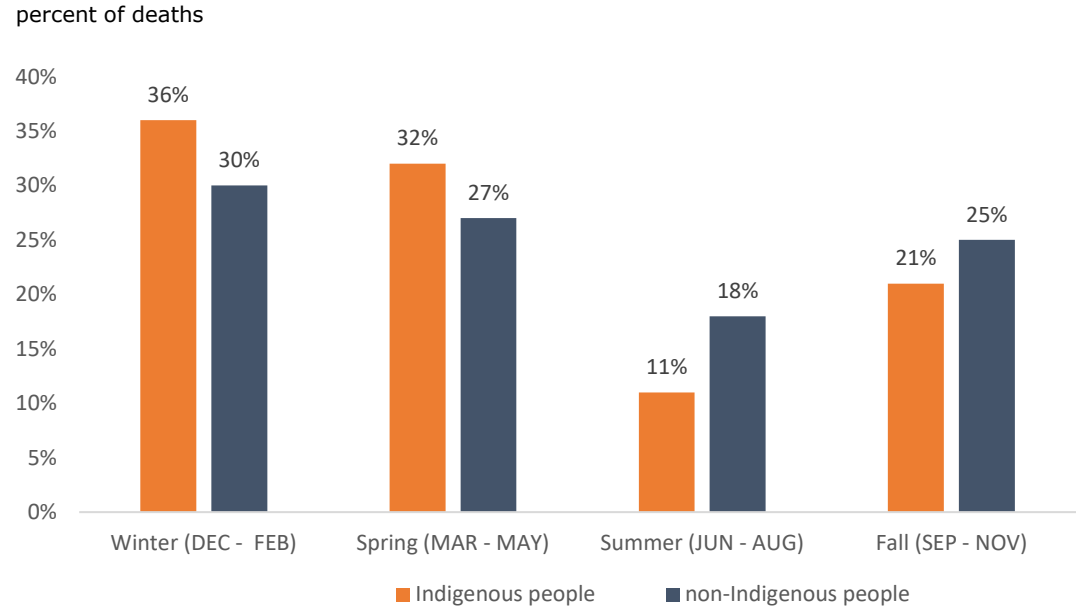
Coroners and medical examiners may include information on alcohol or drug use prior to fatal events in reports submitted to CCMED. Information on alcohol and drugs (presence or non-presence) was less often included in CCMED fire-related death reports among non-Indigenous people than among Indigenous people. For this reason, proportions of fire-related deaths involving alcohol or drugs cannot be compared between the two population groups.

Most fire-related deaths occur in the colder months

In Canada, most fire-related deaths occur in the colder months.² From 2011 to 2020, among both Indigenous and non-Indigenous people, the largest proportion of fire-related deaths occurred in the winter months, followed by spring, fall and summer (Chart 3). During the colder months, there is increased usage of heaters and wood-burning stoves. In addition, people may remain indoors for longer periods of time, leading to an increased potential for indoor smoking and use of candles.

The proportion of fire-related deaths occurring in the summer and fall months was lower among Indigenous people (32%) than among non-Indigenous people (43%), while the proportion of fire-related deaths occurring in the spring and winter was higher among Indigenous people (68%) than among non-Indigenous people (57%).

Chart 3
Proportion of fire-related deaths among Indigenous and non-Indigenous people, by season, Canada, 2011 to 2020



Notes: No weights were used in calculating the estimates.
Source: Statistics Canada, linked dataset integrating the 2006 and 2016 Census of Population, the 2011 National Household Survey and the Canadian Vital Statistics - Death database (2011-2020) with the Canadian Coroner and Medical Examiner Database (2011 to 2020).

Residential fires account for the large majority of fire-related deaths

Residential fires accounted for the large majority of fire-related deaths among Indigenous people (89%) and non-Indigenous people (86%) identified in the linked dataset. This is consistent with previous studies showing that residential fires accounted for a substantial proportion of fire incidents and an even greater proportion of fire-related deaths.^{2,13}

Cooking, electrical, and heating devices the most common sources of fatal fire among Indigenous people

A previous Statistics Canada release found that fires ignited by a cigarette, cigarette lighter, pipe or other smoking materials were reported in at least 20% of unintentional residential fire-related deaths.²

From 2011 to 2020, the source of the fire was not always specified in coroner and medical examiner reports submitted to the CCMED. The initial source of fire was more often unspecified or undetermined in fatal fires involving Indigenous deaths (72%) compared to non-Indigenous deaths (55%) identified in the linked dataset. Information on ignition source is more likely to be undetermined or unknown when there is significant damage to a structure.

Cooking, electrical and heating devices (14%) were reported to be the most common sources of fatal fire among Indigenous people, followed by cigarettes (7%) and candles or other open flames (7%). Among non-Indigenous people, fires were more often ignited by cigarettes (16%), cooking, electrical and heating devices (15%), and candles or open flames (14%).

Nearly 1 in 8 residential fire-related deaths among Indigenous people occurred in residences without a working smoke alarm

The risk of fire-related injury or death can be significantly reduced by having the recommended number of functional smoke alarms correctly placed in the home.¹⁴

From 2011 to 2020, information on smoke alarms was often unspecified in the coroner and medical examiner reports submitted to the CCMED. The information on smoke alarms was either not specified, unknown or not applicable for 80% of fire-related deaths among Indigenous people and 78% among non-Indigenous people. The presence or functionality of a smoke alarm cannot always be confirmed following an investigation where the damage to the home is significant.

The coroners and medical examiners reported missing or non-functional smoke alarms in 1 in 8 (12%) residential fire-related deaths among Indigenous people and 11% among non-Indigenous people identified in the linked dataset. The findings are consistent with a previous Statistics Canada release on unintentional residential fire-related deaths using data from the CCMED, which found that at least 14% of unintentional residential fire-related deaths from 2011 to 2020 occurred in a home without a working smoke alarm.²

Where did the deceased person live? A focus on usual place of residence

The next sections provide information on where the deceased lived prior to their death (i.e., their usual place of residence). Geographic detail (i.e., population centre size) for the deceased's usual residence at death was collected from the CVSD. Additional information on place of residence (e.g., condition of dwelling) was collected from the census closest to and preceding the date of death. Although most fire-related deaths occurred on or around residential property, it is not possible to determine whether the fatal fire occurred in the usual residence at time of death, in the residence lived in on Census Day, or in another residence (e.g., deceased may have moved or may have been staying with a friend). The linked dataset did not include detailed information on the location of the residential fire. Instead, the deceased person's usual place of residence will be used as a proxy for the location of residential fire.

The majority of people who died in a residential fire lived in single-detached houses

According to the 2006 and 2016 Census of Population and 2011 NHS data from the linked dataset, more than three quarters (76%) of Indigenous people and more than half (56%) of non-Indigenous people who died in a residential fire lived in single-detached houses.

The repair status of these houses and other residence types varied by population group. About 56% of Indigenous people who died in a residential fire lived in residences that needed major repairs, that is residences with defective plumbing, electrical wiring and or requiring structural repairs. In comparison, 13% non-Indigenous people who died in a residential fire lived in residences needing major repair. According to 2016 Census of Population, 19.4% of the Indigenous population lived in a dwelling that required major repairs compared to 6% for the non-Indigenous population.¹⁵

The average number of people living in a household was two times higher among Indigenous people who died in a residential fire than among non-Indigenous people

Analysis of data collected from the Census closest to and preceding death showed that the average number of people living in a household was two times higher among Indigenous people (5.0 people) who died in a residential fire than among non-Indigenous people (2.5 people). The average number of rooms and bedrooms in the residence was similar for Indigenous and non-Indigenous people who died in a residential fire.

According to the 2016 Census of Population, close to one-fifth of the Indigenous population lived in crowded housing that was considered not suitable for the number of people who lived there.¹⁵ An overcrowded household may increase risk of fire-related death as exits or pathways may be blocked with personal belongings, and an increase in personal belongings could cause the fire to spread more quickly.

A bigger household may also lead to a higher number of people dying in a single residential fire. CCMED data showed that the proportion of residential fire-related deaths where a residential fire caused two or more deaths was nearly three times higher among Indigenous people (20%) than among non-Indigenous people (7%).

Two-thirds of Indigenous people who died in a residential fire lived in rural areas

Rural areas are more likely to experience significant fires and fire-related fatalities due to the absence of nearby fire-stations and hospitals. Two-thirds (68%) of Indigenous people who died in a residential fire lived in rural^{iv} areas, 20% in small population centres (population between 1,000 to 29,999) and 12% in medium-to-large urban population centres (population 30,000 or more). In comparison, most non-Indigenous people who died in a fire lived in medium-to-large urban areas (50%), followed by rural areas (34%) and small population centres (16%).

Rural areas tend to be farther from fire stations and paramedic services resulting in increased response times, longer burn times, and faster spreading fires. In addition, volunteer firefighters are often first on the scene of rural fires, influencing the size of potential suppression forces.¹⁶

^{iv} According to the Census of Population, 'rural and small population centres' is defined as the population living in towns and municipalities outside the commuting zone of larger urban centres (i.e., outside the commuting zone of centres with populations of 10,000 or more).

Chart 4
Proportion of residential fire-related deaths among Indigenous and non-Indigenous people, by population centre size, Canada, 2011 to 2020



Notes: No weights were used in calculating the estimates.

Source: Statistics Canada, linked dataset integrating the 2006 and 2016 Census of Population, the 2011 National Household Survey and the Canadian Vital Statistics - Death database (2011-2020) with the Canadian Coroner and Medical Examiner Database (2011 to 2020).

Conclusions

The objective of this study was to examine, present, and compare the circumstances surrounding fire-related deaths among Indigenous people to those among non-Indigenous people. Although there were several similarities between the two population groups, such as sex distribution, manner, cause of death, and presence of smoke alarms, there were some important differences related to demographic and socioeconomic risk factors.

Most notably, Indigenous people who died in a fire were younger on average than non-Indigenous people and the proportion of fire-related deaths occurring in rural areas and in housing needing major repair was higher among Indigenous people who died in a fire. Additionally Indigenous people who died in a fire were more often involved in residential fires causing two or more deaths than non-Indigenous people.

It is recommended that a future study about fire-related deaths consider additional socioeconomic factors such as food security, cost of living, and household income.

Data Sources and Methodology

This study uses data from the Canadian Coroner and Medical Examiner Database (CCMED) and the Canadian Vital Statistics - Death database (CVSD) linked to the 2006 and 2016 Census of Population and the 2011 National Household Survey (NHS). The 2011 to 2020 CCMED data used for this report were extracted in March 2023.

The Canadian Coroner and Medical Examiner Database (CCMED)

The Canadian Coroner and Medical Examiner Database (CCMED) was developed at Statistics Canada in collaboration with the 13 provincial and territorial Chief Coroners and Chief Medical Examiners and the Public Health Agency of Canada. The CCMED contains data on deaths investigated by coroners and medical examiners from all provinces and territories, except Manitoba. It contains information on demographics (e.g., age, sex, date of death, province/territory), causes of death, related health conditions, and circumstances of death. More information on the CCMED can be found at the following link: [Surveys and statistical programs - Canadian Coroner and Medical Examiner Database \(CCMED\) \(statcan.gc.ca\)](https://www150.statcan.gc.ca/n1/pub/82-625-x/2019001/article/00001-eng.htm).

The CCMED does not consistently contain information on population groups. In order to obtain information on Indigenous identity, the database was linked to the Census of Population and NHS. To maximize the number of fire-related deaths from 2011 to 2020 with census information, the CCMED was linked to the 2006 and 2016 Census of Population and 2011 NHS using a pooled approach. About one-third of the 2,200 fire-related deaths identified in the CCMED from 2011 to 2020 had census information. The CCMED records with census information were also linked to the CVSD in order to obtain more complete residential postal code information.

The Canadian Vital Statistics Death Database (CVSD)

The Canadian Vital Statistics - Death database (CVSD) contains information on all deaths in Canada. Data are obtained regularly from provincial and territorial vital statistics registries. The CVSD includes information on basic demographics and causes of death. The underlying cause of death information in the CVSD is coded using the 10th revision of the *International Classification of Diseases and Related Health Conditions* (ICD). Data for Yukon have not been received since 2017. More information on the CVSD can be found at the following link: [Surveys and statistical programs - Statistics Canada, Canadian Vital Statistics - Death database \(CVSD\) \(statcan.gc.ca\)](https://www150.statcan.gc.ca/n1/pub/82-625-x/2019001/article/00001-eng.htm)

Postal Code Conversion File (PCCF+)

The Postal Code Conversion File Plus (PCCF+) provides a link between six-character postal codes produced by Canada Post, standard 2016 census geographic areas (such as dissemination areas, census subdivisions, and census tracts) produced by Statistics Canada, and supplementary administrative areas and neighbourhood income quintiles.

Postal codes do not respect census geographic boundaries and may be linked to more than one standard geographic area or assigned to more than one set of coordinates. Therefore, one postal code may be represented by more than one record. The PCCF+ product, produced by Statistics Canada, provides links between postal codes and all recorded matches to census geography. In this analysis, PCCF+ was generated using the place of residence postal code from the CVSD.

The Census datasets

The Census of Population is designed to provide information about people and housing units in Canada by their demographic, social and economic characteristics.

Information on the 2006 Census can be found here: [Surveys and statistical programs - Census of Population \(statcan.gc.ca\)](https://www150.statcan.gc.ca/n1/pub/82-625-x/2019001/article/00001-eng.htm). The 2006 Census was held on May 16th, 2006. In 2006, there were 22 incompletely enumerated reserves and settlements in the census.

Information on the 2011 Census and NHS can be found here: [Surveys and statistical programs - Census of Population \(statcan.gc.ca\)](#) and [Surveys and statistical programs - National Household Survey \(NHS\) \(statcan.gc.ca\)](#), respectively. The NHS was a voluntary survey which replaced the long-form census in 2011. The 2011 NHS was held on May 10th, 2011. In 2011, there were 36 incompletely enumerated reserves and settlements in the NHS.

Information on the 2016 Census can be found here: [Surveys and statistical programs - Census of Population \(statcan.gc.ca\)](#). The 2016 Census was held on May 10th, 2016. In 2016, there were 14 incompletely enumerated reserves and settlements in the census.

Information about the linkage

The CCMED, CVSD and census datasets were linked in Statistics Canada's Social Data Linkage Environment (SLDE) using variables such as: surname, given names, birthdate, and geography (province, city, postal code). Within SDLE, population data files for social analysis are linked to the Derived Record Depository (DRD), a dynamic relational database containing only basic personal identifiers (surname, given names, birthdate, and geography (province, city, postal code)). Survey and administrative data are linked to the DRD using a generalized record integration software that supports deterministic and probabilistic integration. The linkage was conducted in accordance with the Policy on Record Linkage¹⁷ and approved by Statistics Canada's Executive Management Board. Statistics Canada ensures respondent privacy during linkage and subsequent use of linked files.

Variables

From the CCMED:

- Demographic variables such as age, sex, date of birth, date of death, province/territory
- Causes of death and related health conditions
- Multiple deaths for a given event
- Circumstances of death and coroner/medical examiner narrative report

From the CVSD:

- Postal codes for usual place of residence
- Underlying cause of death

From PCCF+:

- Population centre and rural area classification

From the Census:

- Indigenous identity population (First Nations people, Metis, Inuit, those with Registered or Treaty Indian Status, those with membership in a First Nation or Indian band) and the non-Indigenous population
- Usual place of residence: Residence type
- Usual place of residence: State of repair of residence
- Number of people in the household

Limitations

The CCMED includes data from 12 provinces and territories. Data for Manitoba are not currently included in the database. All data are considered preliminary and include only closed cases. Closed cases refer to those whose investigation or inquest is complete and whose cause and manner of death are final.

CCMED data coverage varies from one variable to another. Coroners and medical examiners may include additional circumstance information in the reports submitted to the CCMED, but the level of detail provided in the report varies by death investigator. When there is no detail or information provided for a given circumstance, the information is considered 'not specified' and results for that circumstance should be interpreted with caution.

About one-third of the 2,200 (700) fire-related deaths identified in the CCMED from 2011 to 2020 linked to at least one of the three sample surveys (2006 or 2016 Census of Population or 2011 NHS). The linked dataset may not be representative of all fire-related deaths in Canada. That is, the proportions presented in this article may not reflect the true distribution of fire-related fatalities considering only a subset of fire-related deaths linked to the census datasets. Caution should be exercised when interpreting the results. In addition, the results should not be extrapolated to the entire population of Indigenous and non-Indigenous people in Canada.

Indigenous people living on reserve and in the territories were overrepresented among Indigenous people sampled for the 2006 and 2016 Census of Population and the 2011 NHS. The analysis excludes institutional and collective dwelling populations and excludes those living on incompletely enumerated reserves and settlements. Furthermore, Indigenous identity was self-reported, which may have led to underestimation or overestimation of the mortality proportions in some Indigenous groups. The proportions of fire-related fatalities for small areas and small subgroups of the population may experience substantial year-to-year random fluctuations since death is a relatively rare event, particularly death resulting from a fire.

While the article used place of residence information collected on the Census Day closest to but preceding death (May 16, 2006; May 10, 2011; May 10, 2016), it is possible that the individual was in a different residence during the fatal fire. Additionally, the deceased's family composition at the time of their death may differ from the information collected on Census Day (i.e., older child may have moved out of the home, deceased married or began living in a common-law relationship etc.).

While a distinction-based approach to acknowledge the unique histories, interests and priorities of First Nations people, Métis, and Inuit is important, such an approach was not feasible due to the small sample size of Indigenous people in the linked dataset.

To ensure the confidentiality of the results, a controlled rounding process was used. Counts were rounded to a neighbouring multiple of five.

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Appendix 1

Comparing the total population of fire-related deaths in CCMED from 2011 to 2020 (2200 deaths) to the total number of fire-related deaths from the linked dataset (700 deaths), by select characteristic.

Variable Name	Description	Percent distribution of fire-related deaths in CCMED (2200) (%)	Percent distribution of fire-related deaths in the linked dataset (700) (%)
Select demographic information			
Sex	Male	63%	62%
	Female	36%	38%
Age group	0 - 45 years	29%	28%
	45 years and older	71%	72%
Province*	Quebec	25%	23%
	Ontario	36%	34%
	Saskatchewan	5%	7%
	Alberta	13%	14%
	British Columbia	12%	12%
Some select circumstances information			
Season	Winter (DEC - FEB)	32%	31%
	Spring (MAR - MAY)	28%	28%
	Summer (JUN - AUG)	18%	17%
	Fall (SEP - NOV)	22%	24%
Cause of death**	Smoke Inhalation	63%	62%
	Burns	21%	22%
	Smoke inhalation and burns	10%	10%
Manner of death	Accident	81%	78%
	Suicide	12%	15%
	Other	7%	7%
Location of death	Residential	87%	87%
	Non-residential	8%	7%
	Not specified	5%	6%

Note(s): * select provinces with majority of fire-related deaths

** select causes of death