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Mortality among First Nations people, 2006 to 2016

by Jungwee Park

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ABSTRACT

Background

First Nations people were reported to have a shorter life expectancy and were more likely than their non-Indigenous counterparts to die prematurely from avoidable causes.

Methods

Using the 2006 Canadian Census Health and Environment Cohort (CanCHEC), the number and rates of deaths for a 10-year follow-up period for on- and off-reserve First Nations people and the non-Indigenous population were calculated by sex, age and region.

Results

According to the 2006 CanCHEC data, First Nations people showed higher age-standardized mortality rates (ASMRs) compared with the non-Indigenous population. On-reserve First Nations people showed higher ASMRs than off-reserve First Nations people. First Nations people's excess mortality, compared with their non-Indigenous counterparts, was caused by deaths from diabetes, heart diseases, chronic liver disease and cirrhosis, unintentional injuries, and intentional injuries (suicide and assault). The mortality differential between First Nations people and the non-Indigenous population was found to be more pronounced among younger age groups.

Interpretation

First Nations people's excess mortality can be better understood by examining specific causes for specific population groups, based on age, sex, being on- or off-reserve, and region.

Keywords

Mortality, Indigenous, First Nations, cohort studies, causes of death

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What is already known on this subject?

- A significant mortality differential exists between the Indigenous and non-Indigenous populations in Canada.
- First Nations people were more likely than their non-Indigenous counterparts to die prematurely from avoidable causes.

What does this study add?

- The specific causes of death leading to the excess mortality of First Nations people, compared with their non-Indigenous counterparts, are examined.

It has been reported that Indigenous health in Canada is fundamentally linked to the historic and ongoing processes of colonization. The impact of colonization has been internationally identified as a unique and fundamental social determinant of Indigenous health linked to all other health inequities of Indigenous people.²⁴ Also, the process of colonization has resulted in ongoing and entrenched racism against Indigenous peoples, which significantly affects their health and well-being, cutting across the social determinants of health and impacting access to education, housing, food security and employment, and permeating societal systems and institutions, including the health care, child welfare and criminal justice systems.^{1,2,6,12,20,21,22,33} In addition, social determinants of health predispose Indigenous peoples to a number of ill-health behaviours that in turn affect health outcomes: smoking, which is related to cardiovascular disease and lung cancer²² and lack of exercise and poor diet, which are associated with type II diabetes.^{8,9,15} An Ontario study reported a promising result on alcohol consumption: First Nations living on reserve are more likely to abstain from alcohol.¹⁹ However, the prevalence of excessive alcohol intake and abuse is also higher, which is related to increases in mortality.^{22,23} Furthermore, First Nation adults, in particular men (both on and off reserve), are more likely to combine heavy drinking and smoking than are non-Aboriginal adults, substantially increasing their risk for cancers of the mouth and throat.¹⁹

The Truth and Reconciliation Commission (TRC) of Canada (recommendation #19) has called upon the federal government to publish data about and assess long-term health trends of Indigenous peoples,³² and mortality statistics are an important health indicator. Despite extensive research on health disparities, existing detailed statistics on the mortality of First Nations people are sparse.² A limited number of studies have examined First Nations people's mortality on a national scale, particularly those examining specific causes of death. Also, separate analyses of the mortality of on- and off-reserve First Nations people are rare.²

Overall, disparity in mortality between First Nations people and the non-Indigenous population has been well documented.^{2,4,6,7,11,13,14,17,31} In 2011, the life expectancy for the First Nations household population at age 1 was 72.5 years for males and 77.7 years for females. This indicates that their life expectancy was 8.9 and 9.6 years shorter, respectively, than for non-Indigenous

males and females.²⁹ In addition to a shorter life expectancy, First Nations people were more likely than their non-Indigenous counterparts to die prematurely from avoidable causes. During the 1991-to-2006 period, First Nations adults had more than twice the risk of dying from avoidable causes compared with non-Indigenous adults.²¹

By relying on linked mortality data made available in recent years (2006 to 2016), this analysis attempts to fill the aforementioned information gap. This study aims to provide detailed information on mortality rates and causes of death for First Nations men and women on a national scope, unlike previous research that relied on regional data. By comparing their cause-specific mortality rates with those of the non-Indigenous population, the study examines causes of excess deaths among First Nations people. This analysis helps assess long-term trends of First Nations people's health, as recommended by the TRC.³²

Moreover, this analysis presents mortality differentials between First Nations people and the non-Indigenous population for specific age groups and geographic regions. It is important to conduct age-specific examination of mortality differentials, as specific age groups tend to have different leading causes of death. Mortality differentials between First Nations people and the non-Indigenous population may show different patterns in each age group. By helping to identify populations at higher risk, both age- and region-specific analyses of mortality differentials would provide policy-relevant information.

Also, this study separately investigates the mortality information of First Nations people living on-reserve as well as off-reserve. As many differences in health outcomes between on- and off-reserve First Nations people have been reported,^{5,10,16} it is important to investigate whether distinctive patterns of mortality exist between both groups. Similarly, it is worth examining mortality differentials by geographic region. Such examination is important, given the distinctive provincial distribution of the First Nations population²⁷ and the role of provincial and territorial governments in Indigenous people's health (CICH, 2020).³⁵ It was reported that even within a province, First Nations people living in different regions showed significantly different health conditions.¹⁸

The following are research questions this study attempts to answer:

Research questions:

- To what extent do the mortality rates (overall rates and rates for specific causes of death) of First Nations people differ from those of the non-Indigenous population?
- How do the mortality rates of on-reserve and off-reserve First Nations people compare or differ?
- What specific causes of death contribute to mortality differentials found among First Nations people, compared with the non-Indigenous population?
- To what extent do the mortality rates (overall rates and rates for specific causes of death) of First Nations people differ from those of the non-Indigenous population for different age groups?
- To what extent do the mortality rates (overall rates and rates for specific causes of death) of First Nations people differ from those of the non-Indigenous population for different geographic regions?

Methods

This article is a secondary analysis of data from the 2006 Canadian Census Health and Environment Cohort (CanCHEC).

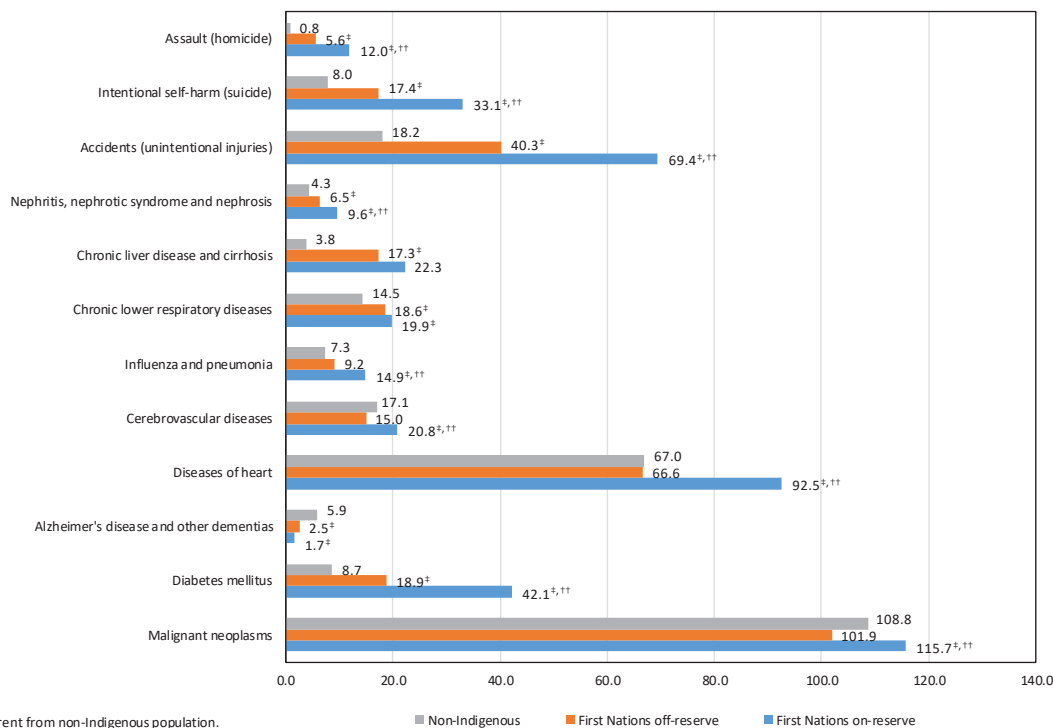
Data source and study population:

The CanCHECs are population-based, probabilistically linked datasets.³⁰ The CanCHECs combine long-form census respondents (or National Household Survey respondents) with administrative health data (e.g., mortality, cancer, hospitalizations, ambulatory care) and annual mailing address postal codes. Data linkages for the 2006 CanCHEC were constructed using Statistics Canada’s Social Data Linkage Environment (SDLE).²⁸ The SDLE helps create linked population data files for social analysis through linkage to the Derived Record Depository (DRD), a dynamic relational database containing only basic personal identifiers. Survey and administrative data are linked to the DRD using a generalized record linkage software that supports deterministic and probabilistic linkage. Unlike earlier CanCHECs, the 2006 CanCHEC did not have age restrictions.

Census information for the 2006 CanCHEC was based on a mandatory long-form questionnaire that was administered to the non-institutional population (about one in five households), including individuals in collective dwellings (e.g., rooming houses and hotels), who usually live in Canada on Census Day. In 2006, the response rate for the long-form questionnaire was 93.5%.

There were 22 incompletely enumerated Indian reserves in the 2006 Census.³⁰ In this article, the on-reserve population is a

Figure 1
Age-standardized mortality rates per 100,000 person years at risk, by cause of death, on- and off-reserve First Nations, and non-Indigenous people, Canada, 2006 to 2016



[†] Different from non-Indigenous population.
^{††} Different from First Nations people living off-reserve.
Note: Mortality rates have been standardized to the Indigenous population age structure (both sexes combined) using the 2006 Census of Canada.
Source: Statistics Canada, 2006 Canadian Census Health and Environment Cohort, 10-year (2006 to 2016) mortality follow-up period.

derived census variable that is captured by using the census subdivision (CSD) type according to criteria established by Indian and Northern Affairs Canada.²⁵

Analytical techniques:

The number of deaths and people still living during a 10-year follow-up period was calculated. Numbers were provided for on- and off-reserve First Nations people and the non-Indigenous population by sex, age and region. The bootstrap replicate weights were used to estimate appropriate standard errors and 95% confidence intervals. Statistical testing of differences across groups was conducted using the weighted estimates and standard errors with 500 bootstrap weights provided with the 2006 CanCHEC.

Using the 2006 Census, mortality rates were standardized to the Indigenous population age structure (both sexes combined). Age-standardized mortality rates (ASMRs) were calculated for on- and off-reserve First Nations people and the non-Indigenous population, by sex and by province.

To examine mortality differentials between groups, rate ratios (RRs) were calculated, comparing the ASMRs for First Nations people (on- and off-reserve) with those of the non-Indigenous population. Also, to assess the relative contribution of specific causes of death to the overall mortality differential, rate differences were calculated.

Measures

First Nations people

In this study, First Nations identity was defined by the following question in the 2006 Census: “Is this person an Aboriginal person, that is, North American Indian, Métis or Inuit (Eskimo)?” Answer choices were “No;” “Yes, North American Indian;” “Yes, Métis;” and “Yes, Inuit (Eskimo).” Those who

answered “Yes, North American Indian” were classified as First Nations people.

Respondents who had multiple Indigenous identities were excluded from the study. They typically represent a small proportion of the total population with an Indigenous identity.

Non-Indigenous population

The non-Indigenous population was defined by the following criteria: (1) did not self-identify as First Nations, Métis or Inuit (multiple or single responses); (2) did not report being a Registered or Status Indian (Registered Indians, also referred to as Status Indians, are people registered under the *Indian Act*); and (3) did not report being a member of an Indian band or First Nation.

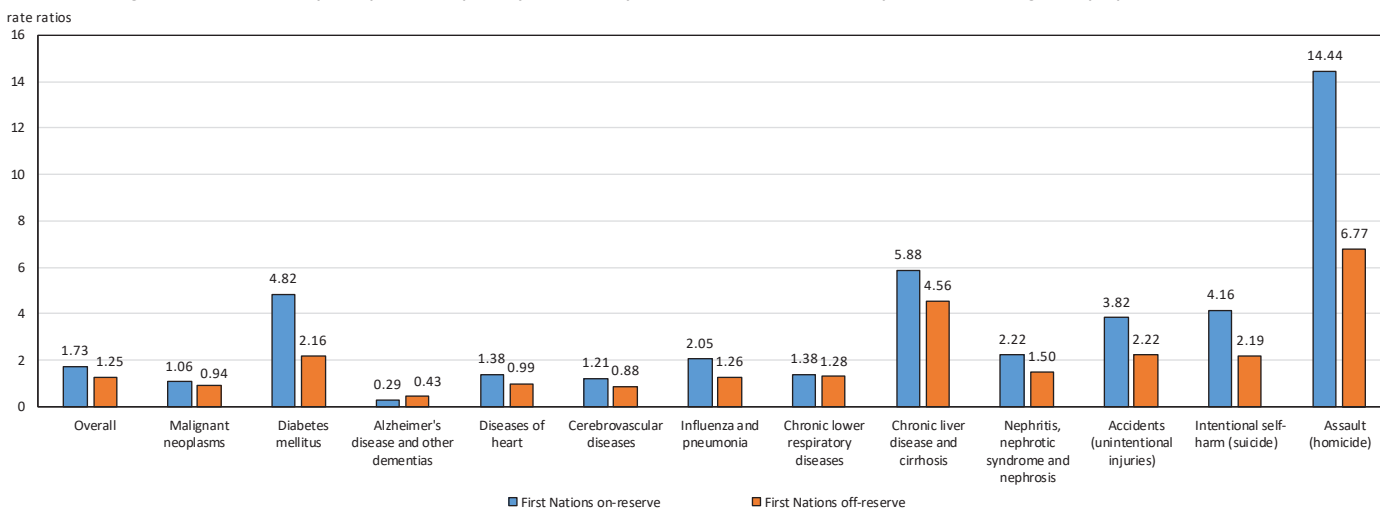
The on-reserve population

The on-reserve population includes all people living in any of eight CSD types legally affiliated with First Nations or Indian bands, as well as selected CSDs of various other types that are northern communities in Saskatchewan, the Northwest Territories and Yukon, which have large concentrations of Registered Indians. “On-reserve” includes legally defined Indian reserves, Indian settlements, other land types created by the ratification of self-government agreements and other northern communities affiliated with First Nations, according to the criteria established by Indian and Northern Affairs Canada.²⁵

Causes of death

Causes of death were based on the World Health Organization’s International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD-10).³⁴ The cause of death tabulated is the underlying cause of death. This is defined as (a) the disease or injury that initiated the train of events leading directly to death, or (b) the circumstances of the accident or

Figure 2
Rate ratios for age-standardized mortality rates per 100,000 person years at risk, by cause of death, First Nations compared with non-Indigenous people, Canada, 2006 to 2016



Source: Statistics Canada, 2006 Canadian Census Health and Environment Cohort, 10-year (2006 to 2016) mortality follow-up period.

violence that produced the fatal injury. The underlying cause is selected from the conditions listed on the medical certificate of cause of death.²⁶ For this article, 12 leading causes were selected for presentation, including their ICD-10 codes:

- malignant neoplasms [C00-C97]
- diabetes mellitus [E10-E14]
- Alzheimer’s disease and other dementias [F01, F03, G30]
- diseases of heart [I00-I09, I11, I13, I20-I51]
- cerebrovascular diseases [I60-I69]
- influenza and pneumonia [J09-J18]
- chronic lower respiratory diseases [J40-J47]
- chronic liver disease and cirrhosis [K70, K73-K74]
- nephritis, nephrotic syndrome and nephrosis [N00-N07, N17-N19, N25-N27]
- accidents (unintentional injuries) [V01-X59, Y85-Y86]
- intentional self-harm (suicide) [X60-X84, Y87.0]
- assault (homicide) [X85-Y09, Y87.1]

Results

Age-standardized mortality rates by cause of death

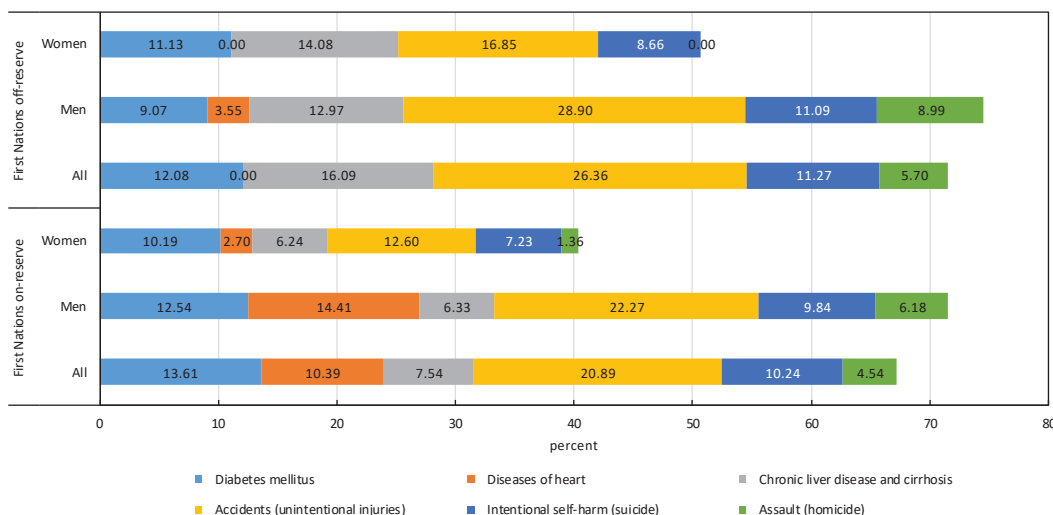
Compared with the non-Indigenous population, First Nations people showed higher ASMRs. From 2006 to 2016, the mortality rate from all causes per 100,000 person years for the non-Indigenous population was 335, while the rate for First Nations people living on-reserve was 581 and that for First

Nations people living off-reserve was 419 (Appendix Table A). With most causes, First Nations people showed higher rates of mortality compared with non-Indigenous people. Some exceptions were found: there was no difference in mortality from cancer, heart diseases, cerebrovascular diseases, and influenza and pneumonia between off-reserve First Nations people and their non-Indigenous counterparts. First Nations people (both on- and off-reserve) also showed lower ASMRs of deaths from Alzheimer’s disease and other dementias.

First Nations people living on-reserve showed significantly higher ASMRs for most causes compared with First Nations people off-reserve. Only deaths from chronic lower respiratory diseases showed no statistical differences between on- and off-reserve First Nations people.

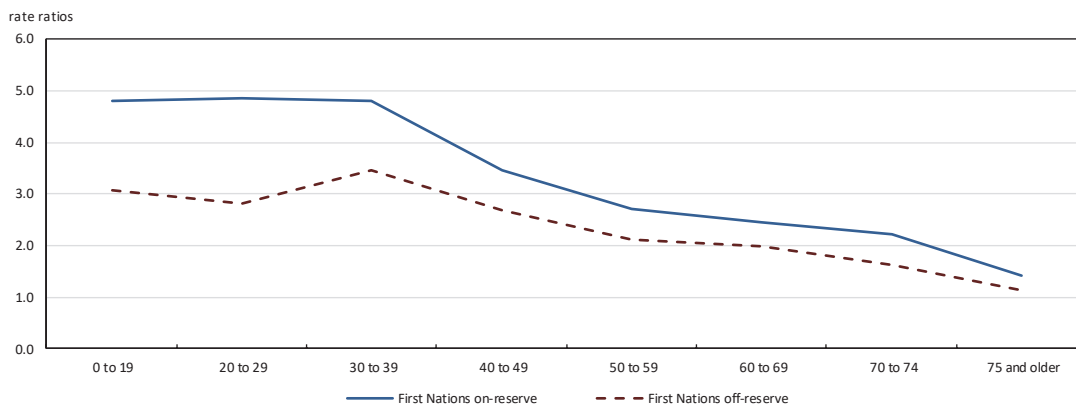
Figure 1 shows ASMRs for the 12 leading causes. For both non-Indigenous and First Nations people, the two most important causes of death were cancer and heart diseases. For First Nations people living on-reserve, these two leading causes were followed by unintentional injuries, diabetes, suicide and chronic lower respiratory diseases; for First Nations people living off-reserve, the leading causes were followed by unintentional injuries, diabetes, chronic lower respiratory diseases, suicide, and chronic liver disease and cirrhosis. Leading causes of death for the non-Indigenous population included unintentional injuries, cerebrovascular diseases and chronic lower respiratory diseases. Alzheimer’s disease and other dementias were an important cause of death for non-Indigenous people, while these were the least important of the 12 leading causes for First Nations people. The ASMR for deaths from Alzheimer’s disease was about 6 out of 100,000 person years; however, combined with deaths from vascular dementias and other dementias, the ASMR rose to 20.

Figure 3
Main causes of excess deaths for First Nations people: Contribution to excess mortality by cause of death, for First Nations people, Canada, 2006 to 2016



Source: Statistics Canada, 2006 Canadian Census Health and Environment Cohort, 10-year (2006 to 2016) mortality follow-up period.

Figure 4
Rate ratios for crude mortality rates per 100,000 person years at risk, by age group, First Nations compared with non-Indigenous people, Canada, 2006 to 2016



Source: Statistics Canada, 2006 Canadian Census Health and Environment Cohort, 10-year (2006 to 2016) mortality follow-up period.

Rate ratios

To examine the extent to which ASMRs for specific causes differ between First Nations people and their non-Indigenous counterparts, Figure 2 shows RRs. The overall ASMR for First Nations people living on-reserve was 1.7 times (1.8 times for men and 1.6 times for women) higher, compared with the non-Indigenous population; the ASMR for First Nations people living off-reserve was 1.3 times (1.3 times for men and 1.2 times for women) higher, compared with the non-Indigenous population.

The highest RRs were found for assault (14.4 for on-reserve, 6.8 for off-reserve, respectively), chronic liver disease and cirrhosis (5.9 on-reserve, 4.6 off-reserve), diabetes (4.8 on-reserve, 2.2 off-reserve), suicide (4.2 on-reserve, 2.2 off-reserve), and unintentional injuries (3.8 on-reserve, 2.2 off-reserve). First Nations men living on-reserve were 16 times more likely than non-Indigenous men to die from assault (9 times more likely for women on-reserve). For First Nations women, chronic liver disease and cirrhosis contributed to the disparity compared with non-Indigenous women: the RR for women on-reserve was 8.4 and the RR for women off-reserve was 6.7. The RRs for accidental poisoning were higher than the RRs for overall injuries. The RR for First Nations people on-reserve was 6.2, while that for First Nations people off-reserve was 5.7.

Contribution to mortality disparity

Figure 3 presents the relative contributions of specific causes to overall mortality differentials.³ It shows the proportion of rate differences in each of six leading causes (diabetes, heart diseases, chronic liver disease and cirrhosis, unintentional injuries, suicide, and assault) out of total ASMR differences between First Nations people and the non-Indigenous population. For example, the difference in ASMR for all deaths between First Nations people on-reserve and the non-Indigenous population was 245.5, and the ASMR difference between the two populations for diabetes was 33.4. Thus, it is

estimated that the contribution of diabetes to the overall mortality differential was about 13%.

More than two-thirds of the excess mortality of on-reserve First Nations people, compared with the non-Indigenous population, was the result of the six causes of death; more than 70% of the excess mortality of off-reserve First Nations people was contributed to by the same six causes.

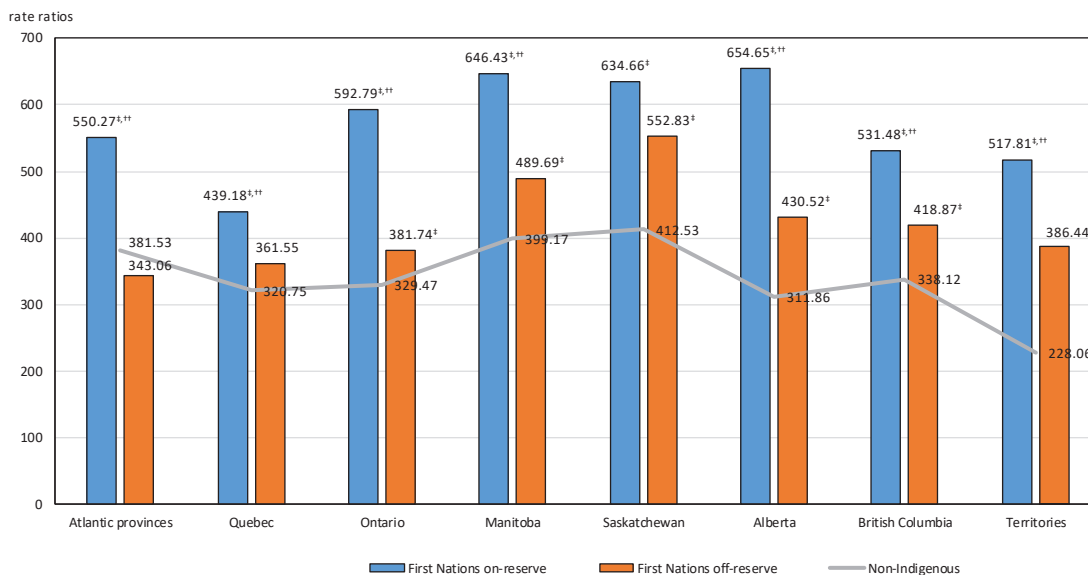
The contribution with the highest percentage came from deaths from unintentional injuries. For example, for First Nations men living off-reserve, almost 30% of overall excess mortality was caused by unintentional injuries. The contribution of assault was much lower among women. It was also found that deaths from heart diseases contributed to the excess mortality of off-reserve First Nations people, but such a contribution was not found among on-reserve people.

Mortality differentials by age group

Age is associated not only with mortality rates but also with causes of death. Relying on RRs for overall deaths for each age group, Figure 4 shows the age pattern of the mortality differential between First Nations people and the non-Indigenous population. In general, the mortality differential was found to be more pronounced among age groups younger than 50. RRs tended to decrease as age increased. The crude mortality rates of First Nations people younger than 40 living on-reserve were about five times higher than those of their non-Indigenous counterparts. Among deaths after age 75, the mortality differentials were much lower: RRs were 1.4 for First Nations people on-reserve and 1.1 for those off-reserve.

In terms of specific causes, each age group showed a distinctive pattern. Higher rates of death of First Nations youth younger than 20, compared with the non-Indigenous population, were related to high mortality differentials for unintentional injuries and intentional injuries (suicide and assault). RRs for suicide were 12.4 for on-reserve and 7.0 for off-reserve youth, and RRs

Figure 5
Age-standardized mortality rates per 100,000 person years at risk, by region, First Nations people and non-Indigenous population, Canada, 2006 to 2016



[†] Different from non-Indigenous population.

^{††} Different from First Nations people living off-reserve.

Source: Statistics Canada, 2006 Canadian Census Health and Environment Cohort, 10-year (2006 to 2016) mortality follow-up period.

for homicide were 15.1 and 11.4, respectively. For deaths that occurred among First Nations people aged 20 to 39, remarkably high RRs were observed for deaths from chronic liver disease and cirrhosis (22.5 among those on-reserve aged 20 to 29 and 21.5 for those on-reserve aged 30 to 39). For those aged 40 and older, high RRs tended to spread to several causes rather than being concentrated on a smaller number. Besides unintentional injuries and assault, high RRs were found for diabetes; influenza and pneumonia; chronic liver disease and cirrhosis; and nephritis, nephrotic syndrome and nephrosis. RRs for suicide decreased among deaths after age 40, but this still remained an important cause of mortality.

Mortality differentials by province and territory

It is important to examine mortality patterns in different geographic regions. In almost all provinces and territories, First Nations people showed higher ASMRs than their non-Indigenous counterparts. The only regions not to demonstrate a significant difference in ASMRs compared with the non-Indigenous population were for off-reserve First Nations people in the Atlantic provinces and Quebec (Figure 5). Also, the mortality rates of on-reserve First Nations people were higher than those of off-reserve First Nations people in all regions except Saskatchewan.

As found in the national ASMRs, excess mortality of First Nations people at the provincial level was strongly affected by a small number of specific causes. High RRs were found for assault, diabetes, chronic liver disease and cirrhosis, unintentional injuries, and suicide. Notably, rates of death from assault in the Prairie provinces were higher than the assault rates of the non-Indigenous population in the same provinces. For

example, RRs for death from assault among on-reserve First Nations people were 19.8, 22.1 and 14.3, respectively, for Manitoba, Saskatchewan and Alberta. First Nations people in the territories showed high excess mortality caused by unintentional injuries, especially poisoning. On-reserve and off-reserve First Nations people in the territories were more than 10 times as likely to die from poisoning as their non-Indigenous counterparts.

Discussion

This study analyzed the mortality statistics of First Nations people living on- and off-reserve to examine how their mortality patterns compare with those of the non-Indigenous population. Using the 2006 CanCHEC data, this study provided comprehensive information on the mortality of First Nations people; statistics for on- and off-reserve First Nations people were explored. This study presented not only overall rates of mortality but also rates of death by specific cause. Furthermore, mortality differentials between First Nations people and the non-Indigenous population were described for specific age groups and geographic regions.

Consistently, First Nations people showed higher ASMRs compared with the non-Indigenous population. On-reserve First Nations people showed higher ASMRs than First Nations people living off-reserve. During the 2006-to-2016 period, the mortality rate (from all causes per 100,000 person years) for the non-Indigenous population was 335, while the rate for First Nations people living on-reserve was 581 and that for First Nations people living off-reserve was 419.

As with the non-Indigenous population, the two leading causes of death were cancer and heart diseases. But mortality differentials measured by RRs were not significant for the two leading causes. This suggests that the most important driving force of mortality differentials was other causes. Greater differences between First Nations and non-Indigenous deaths were found to be caused by assault, chronic liver disease and cirrhosis, diabetes, suicide, and unintentional injuries.

To examine which causes of death were responsible for excess mortality among First Nations people, calculated was the contribution of each cause to the differences between ASMRs for all causes of First Nations people and that of non-Indigenous population. Despite the highest RRs, assault did not provide the highest contribution to excess mortality. This is because the overall number of deaths from assault was relatively low. Death from unintentional injuries was the most important contributor to the excess mortality of First Nations people, compared with their non-Indigenous counterparts. Six causes (diabetes, heart diseases, chronic liver disease and cirrhosis, unintentional injuries, suicide, and assault) were responsible for more than two-thirds of the excess mortality of First Nations people.

The mortality differential between First Nations people and the non-Indigenous population was found to be more pronounced among age groups younger than 50 years of age. Among the older age groups, differences tended to decline. That is, differentials in early and premature deaths were greater than those in deaths that occurred at older ages. Many premature deaths (for example, caused by intentional and unintentional injuries) could have been avoided.

In almost all the provinces and territories, First Nations people showed a mortality differential pattern similar to that of the entire nation: First Nations people showed higher ASMRs than their non-Indigenous counterparts (except for off-reserve First Nations people in the Atlantic provinces and Quebec), and on-

reserve First Nations people had higher mortality rates than off-reserve First Nations people (except in Saskatchewan).

Limitations

As this analysis was based on CanCHEC data, its findings are for the household population at the time of census collection and do not reflect the entire Canadian population (they exclude people living in institutions).

The small size of the First Nations cohort did not allow for detailed analyses. For example, many of the cause-specific mortality rates by age group and by geographic region were suppressed because of small sample sizes. Age- and region-based analyses (figures 4 and 5) could not be done separately by sex.

Some suicides may have been misclassified as another cause of death, such as drowning, poisoning or other injury. The reporting of suicides may also differ by jurisdiction (reserves, towns, cities).³¹

Conclusions

According to the 2006 CanCHEC data, First Nations people showed higher ASMRs compared with the non-Indigenous population. On-reserve First Nations people showed higher ASMRs than off-reserve First Nations people. The excess mortality of First Nations people, compared with their non-Indigenous counterparts, was caused by death from diabetes, heart diseases, chronic liver disease and cirrhosis, unintentional injuries, and intentional injuries (suicide and assault). The mortality differential between First Nations people and the non-Indigenous population was found to be more pronounced among younger age groups. Overall, provinces and territories showed a similar mortality differential to Canada.

Appendix Table A
Age-standardized mortality rates (ASMRs) per 100,000 person years at risk, by cause of death, First Nations people and non-Indigenous population, Canada, 2006 to 2016

Causes of death	First Nations single identity On-reserve			First Nations single identity Off-reserve			Non-Indigenous		
	ASMR	95% confidence interval		ASMR	95% confidence interval		ASMR	95% confidence interval	
		from	to		from	to		from	to
All									
Overall	580.7	572.1	589.4	419.1	404.2	434.1	335.3	334.2	336.4
Malignant neoplasms [C00-C97]	115.7	111.6	119.9	101.9	94.9	108.9	108.8	108.1	109.4
Diabetes mellitus [E10-E14]	42.1	39.7	44.6	18.9	15.8	22.0	8.7	8.5	8.9
Alzheimer's disease and other dementias [F01, F03, G30]	8.5	7.4	9.6	8.6	6.6	10.5	19.8	19.6	20.1
Diseases of heart [I00-I09, I11, I13, I20-I51]	92.5	88.8	96.1	66.6	60.8	72.5	67.0	66.5	67.4
Cerebrovascular diseases [I60-I69]	20.8	19.1	22.5	15.0	12.2	17.8	17.1	16.9	17.4
Influenza and pneumonia [J09-J18]	14.9	13.6	16.3	9.2	7.2	11.3	7.3	7.1	7.5
Chronic lower respiratory diseases [J40-J47]	19.9	18.2	21.5	18.6	15.3	21.9	14.5	14.2	14.7
Chronic liver disease and cirrhosis [K70, K73-K74]	22.3	20.4	24.2	17.3	14.3	20.2	3.8	3.7	3.9
Nephritis, nephrotic syndrome and nephrosis [N00-N07, N17-N19, N25-N27]	9.6	8.5	10.7	6.5	4.6	8.3	4.3	4.2	4.4
Accidents (unintentional injuries) [V01-X59, Y85-Y86]	69.4	66.1	72.7	40.3	35.7	44.9	18.2	17.8	18.5
Intentional self-harm (suicide) [X60-X84, Y87.0]	33.1	30.9	35.3	17.4	14.0	20.8	8.0	7.7	8.2
Assault (homicide) [X85-Y09, Y87.1]	12.0	10.7	13.2	5.6	3.7	7.5	0.8	0.7	0.9
Males									
Overall	663.6	649.9	677.2	470.6	447.0	494.1	370.1	368.4	371.8
Malignant neoplasms [C00-C97]	119.7	113.7	125.7	106.8	96.0	117.5	119.0	118.1	120.0
Diabetes mellitus [E10-E14]	47.1	43.5	50.8	19.5	14.7	24.2	10.4	10.1	10.7
Diseases of heart [I00-I09, I11, I13, I20-I51]	120.1	114.1	126.2	81.4	71.7	91.2	77.9	77.1	78.6
Cerebrovascular diseases [I60-I69]	21.5	19.1	23.9	13.7	9.5	17.8	15.7	15.4	16.1
Influenza and pneumonia [J09-J18]	15.5	13.6	17.5	9.1	6.1	12.1	7.3	7.0	7.5
Chronic lower respiratory diseases [J40-J47]	20.2	17.9	22.5	16.8	12.1	21.4	15.7	15.4	16.1
Chronic liver disease and cirrhosis [K70, K73-K74]	23.8	20.8	26.9	18.3	13.2	23.4	5.3	5.0	5.5
Nephritis, nephrotic syndrome and nephrosis [N00-N07, N17-N19, N25-N27]	10.0	8.4	11.6	8.5	5.4	11.7	4.7	4.6	4.9
Accidents (unintentional injuries) [V01-X59, Y85-Y86]	88.5	83.4	93.7	52.2	44.6	59.9	23.2	22.6	23.8
Intentional self-harm (suicide) [X60-X84, Y87.0]	41.1	37.6	44.6	23.4	17.9	28.9	12.3	11.8	12.7
Assault (homicide) [X85-Y09, Y87.1]	19.3	17.0	21.6	10.2	6.5	14.0	1.2	1.0	1.3
Females									
Overall	497.9	486.0	509.8	378.5	360.5	396.4	303.0	301.7	304.4
Malignant neoplasms [C00-C97]	111.8	106.3	117.2	98.5	89.8	107.3	99.6	98.7	100.5
Diabetes mellitus [E10-E14]	37.2	33.6	40.7	18.4	14.6	22.3	7.3	7.0	7.5
Alzheimer's disease and other dementias [F01, F03, G30]	8.8	7.2	10.3	8.2	5.7	10.8	23.2	22.8	23.6
Diseases of heart [I00-I09, I11, I13, I20-I51]	65.0	60.8	69.3	55.5	48.2	62.8	57.1	56.5	57.7
Cerebrovascular diseases [I60-I69]	20.1	17.7	22.5	16.0	12.2	19.8	18.4	18.0	18.7
Influenza and pneumonia [J09-J18]	14.4	12.4	16.4	9.2	6.5	12.0	7.3	7.1	7.6
Chronic lower respiratory diseases [J40-J47]	19.6	17.1	22.0	19.9	15.5	24.4	13.3	13.0	13.6
Chronic liver disease and cirrhosis [K70, K73-K74]	20.8	18.3	23.3	16.6	12.8	20.4	2.5	2.3	2.6
Nephritis, nephrotic syndrome and nephrosis [N00-N07, N17-N19, N25-N27]	9.2	7.6	10.8	4.9	2.9	6.9	3.9	3.8	4.1
Accidents (unintentional injuries) [V01-X59, Y85-Y86]	50.2	46.3	54.0	30.1	24.6	35.7	13.2	12.8	13.6
Intentional self-harm (suicide) [X60-X84, Y87.0]	25.0	22.3	27.8	12.5	8.4	16.7	3.8	3.6	4.1
Assault (homicide) [X85-Y09, Y87.1]	4.4	3.3	5.6	x	x	x	0.5	0.4	0.6

x suppressed to meet the confidentiality requirements of the *Statistics Act*

Notes: ASMR = Age-standardized mortality rate. Mortality rates have been standardized to the Indigenous population age structure (both sexes combined) using the 2006 Census of Canada. The on-reserve population is a derived census variable that is captured by using the census subdivision (CSD) type according to criteria established by Indian and Northern Affairs Canada. The on-reserve population includes all people living in any of eight CSD types legally affiliated with First Nations or Indian bands, as well as selected CSDs of various other types that are northern communities in Saskatchewan, the Northwest Territories and Yukon, which have large concentrations of Registered Indians. "On-reserve" includes legally defined Indian reserves, Indian settlements, other land types created by the ratification of self-government agreements and other northern communities affiliated with First Nations, according to the criteria established by Indian and Northern Affairs Canada.

Sources: Statistics Canada, 2006 Canadian Census Health and Environment Cohort, 10-year (2006 to 2016) mortality follow-up period.

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