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National Household Survey: Aboriginal Peoples

Suicide among First Nations people, Métis and Inuit (2011-2016): Findings from the 2011 Canadian Census Health and Environment Cohort (CanCHEC)

by Mohan B. Kumar and Michael Tjepkema

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Help Line: 1-855-242-3310

Live chat (https://www.hopeforwellness.ca)

Kamatsiaqtut Help Line

- Toll Free 1-800-265-3333
- In Iqaluit 1-867-979-3333

Kids Help Phone

- Toll Free 1-800-668-6868
- Text 686868 (no data plan, internet connection, or app required)
- Live chat (http://www.kidshelpphone.ca/)

Indian Residential Schools Crisis Line: 1-866-925-4419

Additional resources: Suicide prevention.
http://www.canada.ca/en/public-health/services/suicide-prevention.html

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by **Mohan B. Kumar** and **Michael Tjepkema**

Acknowledgments

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Abstract

Suicide rates have consistently been shown to be higher among First Nations people, Métis and Inuit in Canada than the rate among non-Indigenous people; however, suicide rates vary by community, Indigenous group, age group and sex. The historical and ongoing impacts of colonization, forced placement of Indigenous children in residential schools in the 19th and 20th centuries, removal of Indigenous children from their families and communities during the "Sixties scoop" and the forced relocation of communities has been well documented. These resulted in the breakdown of families, communities, political and economic structures; loss of language, culture and traditions; exposure to abuse; intergenerational transmission of trauma; and marginalization, which are suggested to be associated with the high rates of suicide. While suicide among Indigenous people has been examined previously, studies were based on a decades-old cohort or used an area-based geozones approach. Past studies also examined suicides among only one or two Indigenous groups using the same methodology. Finally, they did not examine suicide among Indigenous people for some geographies such as on and off reserve, rural areas and small, medium and large population centres.

This article attempts to fill some of these knowledge gaps using the 2011 Canadian Census Health and Environment Cohort (CanCHEC), resulting from a record integration between the 2011 National Household Survey (NHS) and the Canadian Vital Statistics Database (CVSD). It presents suicide rates for the 2011 to 2016 time period among self-identifying First Nations, Métis, Inuit, and non-Indigenous people in private dwellings in Canada. It also explores the influence of socioeconomic factors in the disparity in risk of suicide between First Nations people, Métis, Inuit and non-Indigenous people in Canada.

Suicide rates among First Nations people, Métis and Inuit were significantly higher than the rate among non-Indigenous people. The rate among First Nations people (24.3 deaths per 100,000 person-years at risk) was three times higher than the rate among non-Indigenous people (8.0 deaths per 100,000 person-years at risk). Among First Nations people living on reserve, the rate was about twice as high as that among those living off reserve. However, suicide rates varied by First Nations band, with just over 60% of bands having a zero suicide rate. The rate among Métis (14.7[E] deaths per 100,000 person-years at risk) was approximately twice as high as the rate among non-Indigenous people. Among Inuit, the rate was approximately nine times higher than the non-Indigenous rate (72.3 versus 8.0 deaths per 100,000 person-years at risk). Suicide rates and disparities were highest in youth and young adults (15 to 24 years) among First Nations males and Inuit male and females.

Socioeconomic factors, including household income, labour force status, level of education, marital status, and geographic factors such as living on or off reserve (First Nations people) and community size (Inuit) accounted for a notable proportion of the disparity in risk of death by suicide among First Nations people (78%), Métis (37%) and Inuit (40%) adults, 25 years or older. However, due to limitations of the data, the role of other previously-identified

[E] use with caution

factors such as historical and intergenerational trauma, community distress, cultural continuity, family strength and mental wellness were not explored here.

The findings from this study could contribute further to the understanding of suicide among First Nations people, Métis and Inuit in Canada, particularly with respect to the variability in suicide rates and socioeconomic factors associated with the disparity in suicide risk.

Introduction

First Nations people living on and off reserve, Métis and Inuit, die by suicide at a higher rate than non-Indigenous people. These suicides not only result in loss to family, friends and peers leading to immense grief and bereavement, but also to the community and society at large, in particular when the deceased is a young person.[1-4] The impact of suicide is more widespread and severe in small Indigenous communities where many people are related and many experience similar personal and collective adversity.[1]

The suicide rate for children and youth was previously reported to be 10 times higher among males and 22 times higher among females between 2005 and 2007 in areas with a high percentage of First Nations people compared with low-percentage areas.[5] In Inuit Nunangat, the Inuit homeland made up of the Inuvialuit Region (northwest part of Northwest Territories), Nunavut, Nunavik (Northern Québec), and Nunatsiavut (Northern Labrador), the suicide rate among children and youth was 33 times higher than for the rest of Canada between 2004 and 2008.[6] In fact, suicide is one of the leading causes of death among children and youth in areas with a high proportion of First Nations people and in Inuit Nunangat.[5,6]

In adults, the suicide rates (1991 to 2006) among First Nations people and Métis have been reported to be twice as high as that among non-Indigenous adults.[7,8] The suicide rate among adults in Inuit Nunangat (1999 to 2003) was four times higher than the rate among all adults in Canada; the disparity was greater among men than women.

It is important to note, however, that national level suicide rates may underestimate regional or community level differences. For example, previous reports have shown that suicide rates among First Nations youth in British Columbia[9,10] range from 0 to 633 deaths per 100,000 people by tribal council.[9] In fact, the majority of these tribal councils had a zero or very low suicide rate. A similar regional variance has been seen among Inuit communities in Nunavut. The suicide rate varied from under 50 deaths per 100,000 in Whale Cove to just over 250 deaths per 100,000 people in Qikiqtarjuaq.[11]

The high rates of suicide among First Nations people, Métis and Inuit has been suggested to be the result of historical and intergenerational trauma experienced as a result of colonization and on-going marginalization.[1,4,12] Colonialism has also been suggested to broadly impact Indigenous peoples' health by producing social, political and economic inequalities that, in turn, play a role in the development of conditions related to poorer health.[13] Many historical and contemporary factors have been associated with suicide among Indigenous people in Canada.[1] These include acculturation stresses like (1) loss of land, traditional subsistence activities and control over living conditions; (2) suppression of belief systems and spirituality; (3) weakening of social and political institutions; (4) racial discrimination; and (5) marginalization.[1,13,14] For example, racism and social isolation are associated with alcohol and drug use,[13] which are, in turn, associated with suicide.[15] Métis, many of whom experience life not just as Métis but also as First Nations or non-Indigenous people, report that they face distinct forms of discrimination, which affect their mental health.[16] Similarly, the lack of opportunities to self-determination has been identified as a risk factor for suicide in Indigenous communities.[9,13] In addition, the removal of First Nations, Métis and Inuit children and youth from their communities and placement into residential schools in the 19th and the 20th centuries had several deleterious consequences.[1,4] These include separation from family, community, culture and language; often, abuse; family and community breakdowns; and mental illnesses.[1] Additionally, the apprehension of First Nations, Métis and Inuit children from their families and placement into foster homes and child welfare institutions in the second half of the 20th century (the "Sixties scoop") – many times because the families were considered to be poor and Indigenous[17,18] – led to cultural dislocation and identity confusion[1,19] that are also thought to have contributed to suicide among Indigenous people. Furthermore, the intergenerational transmission of trauma, or the transmission of the effects of trauma from parents to their children, has also been associated with suicidal thoughts and attempts among Indigenous people.[20-23] More proximally, the insufficient use of mental health services is associated with suicide among Indigenous people.[4,24] This level of use may be related to the

lack of culturally competent services and inadequate access. Other factors such as community distress including crowded housing and food insecurity, family violence and history of suicide, traumatic stress and early adversity, mental distress and acute stress or loss are suggested to be risk factors of suicide among Inuit.[4]

On the other hand, several resiliency factors, or factors that are associated with lower suicide rates, have been identified among Indigenous youth. These include "cultural continuity" factors such as having a high proportion (50 per cent or higher) of people in the community with knowledge of an Indigenous language.[4,25] Other factors identified in previous literature as increasing resilience include having adopted measures to (1) secure Indigenous title to traditional lands; (2) achieve self-governance; (3) gain control over educational, health care, police and fire services; and (4) establish cultural facilities to preserve and enrich cultural lives.[9,10,25] These factors were identified in First Nations communities in British Columbia; similar studies replicating these findings in other jurisdictions have yet to be published. At the individual level, perceived parent and family connectedness, emotional well-being, success at school, community involvement and connectedness, among others, have been identified as potential protective factors against youth suicide.[1] Furthermore, economic factors – specifically, higher income and employment – have been associated with lower suicide rates.[26-28] In Inuit Nunangat, school attendance and employment rates were correlated with lower suicide rates.[29] Also, social equity, family strength, healthy development among children, tailored mental health services, ability to regulate and cope with distress and adequate social support, etc. have been suggested to serve as protective factors against suicide among Inuit.[4]

Several representatives of Indigenous peoples and governments, communities and government agencies have developed programs, policies or strategies to address the high suicide rate among First Nations people, Inuit and Métis.[4,30,31] Development and evaluation of these require timely data on suicide rates. Many existing estimates of suicide rates are based on an older cohort (1991 Census cohort), which excluded non-tax filers and those under 25,[7] or are from studies that used an area-based geozones approach. The latter classified areas with higher proportions of First Nations residents as First Nations "identity areas"[5] or examined mortality rate in Inuit Nunangat as a proxy for the rate among Inuit.[6] These approaches may have led to under or over estimation of suicide rates. In addition, past reports have only estimated suicide rates among one or two Indigenous groups using the same methodology. Finally, there are gaps in knowledge of suicide rates among Indigenous people for certain geographical areas, including urban areas and on or off reserve.

This article presents suicide rates among self-identifying First Nations, Métis, Inuit and non-Indigenous peoples, who lived in private dwellings (i.e., excluding those who were in collective dwellings and institutions), for the 2011 to 2016 time period. These findings are based on the 2011 Canadian Census Health and Environment Cohort (CanCHEC), which was developed by integrating records in the the 2011 National Household Survey (NHS) and the Canadian Vital Statistics – Deaths Database (CSVD from 2011 to 2016). Suicides that occurred over the follow-up period of 5.63 years (from Census day on May 10, 2011 to end of follow-up on December 31, 2016) were used to generate age-standardized and age-specific mortality rates. These are presented as estimated number of deaths by suicide per 100,000 person-years at risk. The person-year concept is often used in cohort studies and represents unit of time when individuals are at risk of dying, and can be roughly understood as persons per year.[32] Specifically, the article (1) presents suicide rates among First Nations people, Métis and Inuit alongside comparisons with the suicide rates of non-Indigenous people to explore disparities, a better understading of which could inform prevention strategies, (2) presents the estimated proportion of First Nations bands that experienced no suicides as an estimate of the variability in suicide rates, and (3) explores the role of socioeconomic and geographic factors in explaining the excess mortality from suicide among the three groups.

Results

Suicide among First Nations people in Canada

In the current analyses, among the 851,280 First Nations people (based on population estimates using the 2011 CanCHEC and its weights), including status and non-status individuals, living on and off reserve and in private dwellings in 2011, an estimated 1,180 people died by suicide between 2011 and 2016. This resulted in an age-standardized suicide rate of 24.3 deaths per 100,000 person-years at risk (Table 1), which was three times higher than the suicide rate among non-Indigenous people (8.0). The suicide rate was higher among males than females (29.6 versus 19.5, respectively). This pattern is similar to that seen among non-Indigenous people among whom males (12.3) also had a higher suicide rate than females (3.9). However, these numbers indicate that the disparity

in suicide rates – measured by dividing the suicide rate among First Nations people by that among non-Indigenous people (or rate ratios [RR]) – between First Nations and non-Indigenous peoples is higher among females than males (RR = 5.0 among First Nations females and RR = 2.4 among First Nations males; Table 1).

Table 1
Age-standardized suicide rates (number of deaths by suicide per 100,000 person-years at risk) and rate ratios (RR) among First Nations and non-Indigenous people in Canada, by sex, household population aged 1 year or older, Canada, 2011-2016

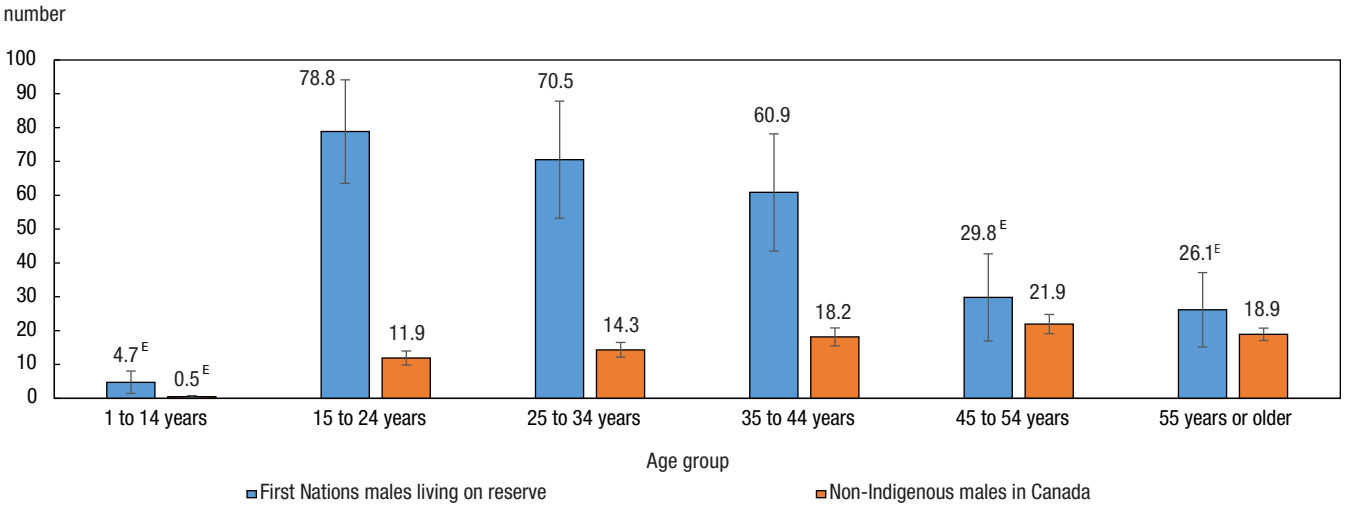
	First Nations people			Non-Indigenous people			First Nations people		
		95% confidence interval			95% confidence interval			95% confidence interval	
Sex	Suicide-related ASMR	lower	upper	Suicide-related ASMR	lower	upper	Rate ratio	lower	upper
Total	**24.3**	**20.6**	**28.0**	**8.0**	**7.6**	**8.5**	**3.0**	**2.5**	**3.5**
Females	19.5	14.5	24.5	3.9	3.5	4.3	5.0	3.6	6.4
Males	29.6	24.1	35.0	12.3	11.5	13.0	2.4	1.9	2.9

Notes: 5.6-year follow-up period: May 10, 2011 to December 31, 2016.
ASMR = Age standardized mortality rate (standardized to the Indigenous population estimated by the 2011 National Household Survey; in 5-year age groups except for those aged 1-4 and those aged 85+.
Excluded from data: institutional population at time of census collection (e.g. nursing homes, jails), population living in collective households (e.g. motels, hotels, rooming houses), persons not enumerated by the 2011 National Household Survey.
Source: Statistics Canada, 2011 Canadian Census Health and Environment Cohort integrating the 2011 National Household Survey with Canadian Vital Statistics Database (2011-2016).

Suicide rates were highest among youth aged 15 to 24 (48.7; non age-standardized) (data not shown) when compared with other age groups. Suicide rates were lower among the older age groups. They were significantly higher among First Nations people than non-Indigenous people in most age groups under 45 years of age, but the disparities were widest among those under 15 years (RR = 8.9) and 15 to 24 years (RR = 6.3) (data not shown). This was particularly apparent among females between 15 and 24 years of age (RR = 12.0; Table A.1 in appendix).

The suicide rate was nearly twice as high among First Nations people living on reserve than among First Nations people living off reserve (non age-standardized rate of 34.1 versus 19.5, respectively). Among on-reserve First Nations people, suicide rates were highest for males aged 15 to 24 years (78.8) (Chart 1). Rates were lower in the older age groups among both males and females on reserve (Table A.2 in appendix). Disparities were particularly elevated among 15 to 24-year-old First Nations females living on reserve (RR = 15.8) in comparison to non-Indigenous females across Canada. Disparities were smaller in the older age groups, but continued to be seen until age 55 for females and age 45 for males. For those aged 55 and older, suicide rates were not statistically different between on-reserve First Nations and non-Indigenous people. A similar comparison to rates among First Nations people living off reserve was not done since most age-specific estimates could not be published due to low cell counts or precision (table A.2 in appendix).

Chart 1
Age-specific suicide rates (number of deaths by suicide per 100,000 person-years at risk) among First Nations males living on reserve and non-Indigenous males in Canada, household population aged 1 year or older, Canada, 2011-2016



[E] use with caution
Notes: Error bars denote 95% confidence intervals.
5.6-year follow-up period: May 10, 2011 to December 31, 2016.
Excluded from data: institutional population at time of census collection (e.g. nursing homes, jails), population living in collective households (e.g. motels, hotels, rooming houses), persons not enumerated by the 2011 National Household Survey, incompletely enumerated reserves.
Source: Statistics Canada, 2011 Canadian Census Health and Environment Cohort integrating the 2011 National Household Survey with Canadian Vital Statistics Database (2011-2016).

No significant differences were seen in the suicide rates among First Nations people (on and off reserve combined) by province and territory. However, in every province, the suicide rate among First Nations people was higher than the non-Indigenous rate (Atlantic provinces were grouped together to increase sample size; suicide rates were not reportable for the non-Indigenous population in Yukon, Northwest Territories and Nunavut). And, the rate ratios were notably higher in the Prairie provinces. It was 4.6, 4.5 and 3.5 in Manitoba, Saskatchewan and Alberta, respectively. In other provinces, it ranged from 1.9 to 2.6. Suicide rates did not differ significantly by type of population centre.[33] It was 28.8 among First Nations people in rural areas, 22.9[E] among those in small population centres and 18.8[E] among those in large population centre. The suicide rate among First Nations people in each of these areas was significantly higher compared with non-Indigenous rates (9.3 for rural areas, 9.0 for small population centres and 7.2 for large population centres).

These national and provincial level estimates, while useful, underestimate the variability in the suicide rates among individual First Nations communities. Suicide rates were estimated at the band level using a geographic approach (for more details, please refer to the methods section). Of the just over 600 First Nations bands in Canada, 555 were associated with reserves that were enumerated in the 2011 NHS and with individuals in the CanCHEC cohort Just over 60% of First Nations bands had experienced no suicides between 2011 and 2016. The proportion of bands without suicides, when examined in the context of the overall on-reserve suicide rate among First Nations people (34.1) highlights the obscuring of variability in the national level estimate. This proportion of bands with zero suicide rate varied by province and territory. A larger proportion of bands in the Atlantic provinces (55%), Ontario (71%), Saskatchewan (53%), British Columbia (78%), Yukon (80%) and Northwest Territories (74%) had zero suicide rates. In the other provinces, the proportion ranged from 39% to 44%. It should be noted that 31 reserves were incompletely enumerated in the 2011 Census many of which were in Ontario and Québec[34] (a brief description of these reserves can be found in the methods section), and were not included in this analysis. Also, band members who did not live on their band's reserve at the time of the Census were not included in the analysis

Socioeconomic factors have previously been shown to be associated with suicide among Indigenous people in North America.[26-28] To examine if similar patterns were evident in the 2011 CanCHEC cohort, the role of individual socioeconomic factors such as household income, labour force status, level of education, marital status and geographic factors such as living on or off reserve on risk of death by suicide were examined for First Nations people aged 25 years or older. After adjusting for age and sex, the risk of suicide[35] among First Nations adults was twice as high as that among non-Indigenous adults (hazard ratio [HR] = 2.0; Table A.4 in appendix). Adjusting for

household income resulted in a decrease in risk by 35%. After further adjusting for labour force status, level of education and marital status, First Nations adults were still at a higher risk of suicide than non-Indigenous adults (HR = 1.4). Together, these factors accounted for 66% of the excess suicide risk. Further adjusting for living on and off reserve resulted in a HR of 1.2, which was not significantly different from 1.0. Together, all these factors accounted for 78% of the excess suicide risk among First Nations adults.

Suicide among Métis in Canada

Based on the current analysis, of the 452,985 self-identifying Métis (based on population estimates using the 2011 CanCHEC and its weights) who lived in private households in 2011, approximately 415 individuals died by suicide in the 2011 to 2016 period. As a result, the suicide rate was 14.7[E] deaths per 100,000 person-years at risk (Table 2), which was nearly twice as high as the rate among non-Indigenous people (8.0). The rate among Métis males (22.6[E]) was more than three times higher than the rate among Métis females (7.2[E]). The suicide rate was nearly twice as high among Métis (22.6[E]) as non-Indigenous males (12.3). However, the suicide rates for Métis (7.2[E]) and non-Indigenous females (3.9) were not significantly different from each other.

Table 2
Age-standardized suicide rates (number of deaths by suicide per 100,000 person-years at risk) and rate ratios (RR) among Métis and non-Indigenous people in Canada, by sex, household population aged 1 year or older, Canada, 2011-2016

	Métis			Non-Indigenous people			Métis		
		95% confidence interval			95% confidence interval			95% confidence interval	
Sex	Suicide-related ASMR	lower	upper	Suicide-related ASMR	lower	upper	Rate ratio	lower	upper
Total	**14.7[E]**	**9.5**	**20.0**	**8.0**	**7.6**	**8.5**	**1.8**	**1.2**	**2.5**
Females	7.2[E]	2.6	11.9	3.9	3.5	4.3	1.9	0.7	3.1
Males	22.6[E]	13.2	31.9	12.3	11.5	13.0	1.8	1.1	2.6

[E] use with caution

Notes: 5.6-year follow-up period: May 10, 2011 to December 31, 2016.
ASMR = Age standardized mortality rate (standardized to the Indigenous population estimated by the 2011 National Household Survey; in 5-year age groups except for those aged 1-4 and those aged 85+.
Excluded from data: institutional population at time of census collection (e.g. nursing homes, jails), population living in collective households (e.g. motels, hotels, rooming houses), persons not enumerated by the 2011 National Household Survey.
Source: Statistics Canada, 2011 Canadian Census Health and Environment Cohort integrating the 2011 National Household Survey with Canadian Vital Statistics Database (2011-2016).

Among the provinces and territories, because of low counts when broken down, suicide rates for Métis could only be generated for Ontario, Manitoba, Saskatchewan, Alberta and British Columbia combined (Ontario and west). In these provinces, the rate among Métis (13.4[E]) were higher than that among non-Indigenous people (7.6). Suicide rates among Métis in rural areas (16.5[E]), and small (12.8[E]) and large population centres (15.5[E]) were not significantly different. The rate among Métis in large population centres was higher than the rate among non-Indigenous people (7.2; marginally significant). Suicide rates could not be published for medium population centres due to low cell counts.

Among Métis adults over 25, after adjusting for age and sex, the risk of suicide was twice as high as that among non-Indigenous adults (hazard ratio = 1.9; Table A.4 in appendix). Adjusting for household income, labour force status, population centre type of place of residence, level of education and marital status accounted for 37% of excess suicide risk. The risk of suicide was 1.6 times higher among Métis than non-Indigenous people after adjusting for these factors.

Suicide among Inuit in Canada

There were approximately 59,220 Inuit in Canada in 2011 who lived in private households (based on population estimates using the 2011 CanCHEC and its weights). Among them, there were an estimated 250 deaths by suicide between 2011 and 2016. This lead to a suicide rate of 72.3 deaths per 100,000 person-years at risk (Table 3). This was nine times higher (RR = 9.0) than the suicide rate among non-Indigenous people (8.0). The suicide rate was three times higher among Inuit males than Inuit females (109.3 versus 35.4[E], respectively).

Table 3
Age-standardized suicide rates (number of deaths by suicide per 100,000 person-years at risk) and rate ratios (RR) among Inuit and non-Indigenous people in Canada, by sex, household population aged 1 year or older, Canada, 2011-2016

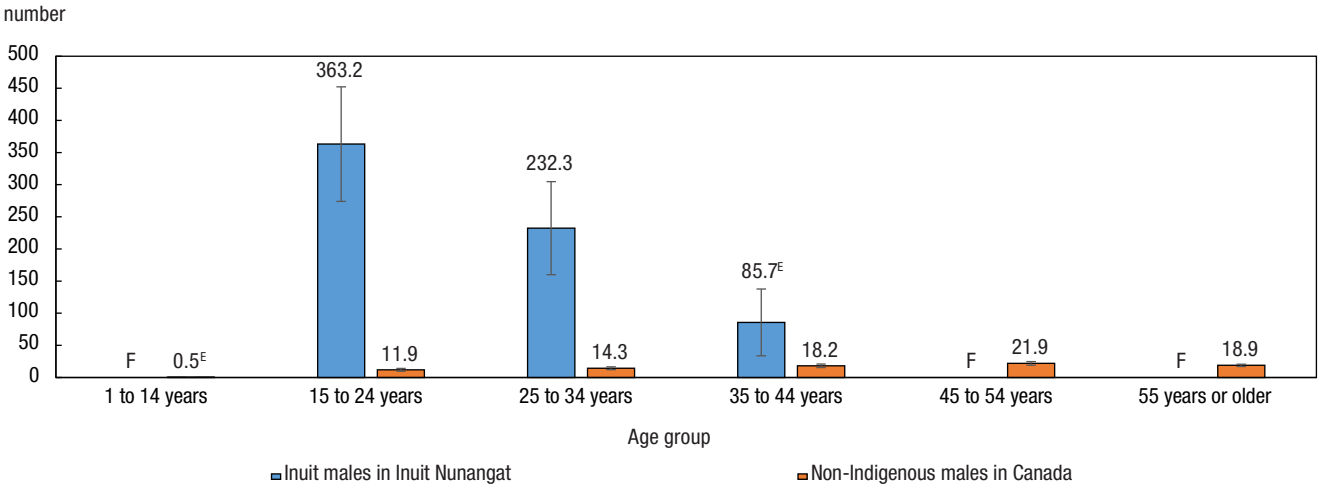
	Inuit			Non-Indigenous people			Inuit		
		95% confidence interval			95% confidence interval			95% confidence interval	
Sex	Suicide-related ASMR	lower	upper	Suicide-related ASMR	lower	upper	Rate ratio	lower	upper
Total	**72.3**	**60.8**	**83.8**	**8.0**	**7.6**	**8.5**	**9.0**	**7.5**	**10.5**
Females	35.4[E]	23.8	46.9	3.9	3.5	4.3	9.0	6.0	12.1
Males	109.3	89.1	129.5	12.3	11.5	13.0	8.9	7.2	10.6

[E] use with caution

Notes: 5.6-year follow-up period: May 10, 2011 to December 31, 2016.
ASMR = Age standardized mortality rate (standardized to the Indigenous population estimated by the 2011 National Household Survey; in 5-year age groups except for those aged 1-4 and those aged 85+.
Excluded from data: institutional population at time of census collection (e.g. nursing homes, jails), population living in collective households (e.g. motels, hotels, rooming houses), persons not enumerated by the 2011 National Household Survey.
Source: Statistics Canada, 2011 Canadian Census Health and Environment Cohort integrating the 2011 National Household Survey with Canadian Vital Statistics Database (2011-2016).

Suicide rates among Inuit were highest in the youth; the highest suicide rate was seen among Inuit males between 15 and 24 years of age (363.2; non age-standardized) living in Inuit Nunangat (Chart 2). Publishable estimates could only be produced for Inuit females between the ages of 15 and 24 and 25 to 34. Suicide rate among females 15 to 24 years of age was 108.9[E], which was 33 times higher than non-Indigenous females of that age (Table A.3 in appendix).

Chart 2
Age-specific suicide rates (number of deaths by suicide per 100,000 person-years at risk) among Inuit males in Inuit Nunangat and non-Indigenous males in Canada, household population aged 1 year or older, Canada, 2011-2016



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Notes: Error bars denote 95% confidence intervals.
5.6-year follow-up period: May 10, 2011 to December 31, 2016.
Excluded from data: institutional population at time of census collection (e.g. nursing homes, jails), population living in collective households (e.g. motels, hotels, rooming houses), persons not enumerated by the 2011 National Household Survey, incompletely enumerated reserves.
Source: Statistics Canada, 2011 Canadian Census Health and Environment Cohort integrating the 2011 National Household Survey with Canadian Vital Statistics Database (2011-2016).

Rates among Inuit were also compared by Inuit Nunangat region. Rates were significantly higher among Inuit in Nunatsiavut (188.2[E]; non age-standardized) than those in Nunavik (98.1) and Nunavut (94.0). Rates among Inuit in Inuvialuit region could not be published due to low reliability of estimates.

The national, Inuit Nunangat and Inuit regional level estimates underestimate the variation in rates among individual Inuit communities. Among the 50 Inuit communities, 11 communities had a suicide rate of zero. However, for most communities (66%), estimates were too unreliable to be published. It should be noted that some deaths may not have linked to the NHS and others may not have been in Vital Statistics at the time of data integration. The latter shortcoming has previously been reported by Jack Hicks.[11] These exclusions may have biased the estimate of number of communities without suicides.

In multivariate analyses, among Inuit adults 25 years and older, the risk of death by suicide was 4.8 times higher than the risk among non-Indigenous adults, after accounting for age and sex (Table A.4 in appendix). After further adjusting for household income, labour force status, level of education and marital status, the hazard ratio decreased to 3.4 suggesting that these factors accounted for 37% of the excess risk of death by suicide among Inuit. After adjusting for size of community (population centre type), Inuit adults were still at 3.3 times higher risk of suicide than non-Indigenous adults (HR = 3.3). All combined, these factors accounted for 40% of the excess risk of suicide among Inuit adults.

Discussion

The report is the first to examine suicide rates among all three Indigenous peoples, including First Nations people, Métis and Inuit, of different age groups and living in different geographies using one methodology. However, gaps in knowledge remain. Further research is needed to assess long-term trends and estimate the role of other risk and protective factors of suicide among Indigenous peoples, which should be done in consultation with First Nations people, Métis and Inuit, as recommended by the Truth and Reconciliation Commission of Canada.

In the current analysis, the suicide rates among First Nations people, Métis and Inuit were many times higher than the non-Indigenous rate during the 2011 to 2016 time period. The rates were highest among Inuit and, specifically, adolescents and young adults. The suicide rate among First Nations people living on reserve was higher than that among those living off reserve, and among males than females. The higher suicide rate among males has been attributed to their tendency to use more lethal methods[36] and to the differential effect of specific stressors in the two sexes.[1] However, greater disparities were observed among First Nations females, where higher suicide rates were seen when compared with non-Indigenous females. These patterns are similar to what has been previously reported.[5,7,8]

Of particular concern is the high rate of suicide among Indigenous children under 15. The suicide rate among First Nations boys, nationally, was four times higher than among non-Indigenous boys. It was ten times higher among First Nations boys living on reserve. As with other national trends, this rate may obscure regional differences. Previously reports have suggested that in some remote First Nations communities in Ontario, under-15 suicide rates were nearly 50 times higher than non-Indigenous rates.[37] And, among Inuit communities of Nunatsiavut, the age-specific disparity was largest among 10 to 19-year-olds relative to their non-Indigenous counterparts outside Inuit Nunangat (RR = 15.8).[38] Also, rate of death by suicide among Inuit children 10 to 14 years of age appears to be increasing since 1989 although significant fluctuations are seen across time.[11] In line with these rates among children, suicidal ideation among grade 5 to 8 school children in Saskatoon was nearly twice as high among Indigenous children as non-Indigenous children after accounting for mental health, cognitive abilities and bullying experiences.[39] While risk factors for suicide among children are numerous and complex, a recent report suggests that Inuit children and youth in Nunavut experience a lack of mental health services that are specific to them, culturally relevant and of adequate quality.[40]

Some positive trends were evident from the data. Over 60% of the First Nations bands had zero suicide rates. This is in agreement with previous findings on youth suicide in First Nations communities in British Columbia[9] and Ontario.[41] In British Columbia, between 1987 and 1992, half of the First Nations communities had no deaths by suicide among youth.[25] In Ontario, most First Nations communities had few or no suicides.[41] Chandler and Lalonde attributed the low rates in many British Columbia First Nations communities to "cultural continuity" factors[25] referenced previously. Other research has suggested that histories, cultural norms, responses to stressors and relationship to mainstream culture differ by community leading to variation in exposures and outcomes including resilience.[42] This may explain the variation in suicide rates seen here. For Inuit, reliable estimates could not be generated for most of the Inuit communities. A previous report indicated that rates ranged from less than 50 to just over 250 deaths per 100,000 population in Inuit communities in Nunavut between 1999 and 2014.[11]

And, while time trends were not examined here, suicide attempts among First Nations people in British Columbia have been reported elsewhere to be declining. Risk of self-inflicted injury hospitalization among Registered Indians, and disparity between them and their non-Indigenous counterparts decreased between 1991 to 2010.[43] However, this is in contrast to trends in remote First Nations communities in Ontario. There, Indigenous youth suicide was previously reported to be on the rise because of the emergence of suicide among communities that previously did not experience it, exposure to suicide or suicide attempts among family members and peers, and increase in clusters of suicides.[41]

Geographic and socioeconomic factors, specifically household income, labour force status, highest level of education, marital status and geographic location together accounted for a notable proportion of the excess risk of death by suicide among First Nations people (78%), Inuit (40%) and Métis (37%). Age, sex, household income, labour force status, level of education and marital status accounted for the majority (66%) of the excess risk among First Nations people, aged 25 or older. Accounting for living on or off reserve increased the explained excess risk to 78%. In comparison, among Inuit, age, sex, labour force status, household income level of education, marital status and community size explained 40% of the excess risk of suicide. Among Métis, these factors accounted for 37% of excess risk. The reasons for the differences are unclear. However, among First Nations people, a significantly higher percentage in the cohort were in the poorest income quintile (40.7%) compared with Métis (22.9%), Inuit (23.9%) or non-Indigenous people (18.1%) (Appendix table A.5). This may explain the higher percentage of risk of suicide accounted for by household income among First Nations people. It should also be noted that measures of relative income used here were not adjusted for differences in the cost of living and price of commodities in Inuit Nunangat. In secondary analysis, a measure of material poverty, low-income measure using after tax income (LIM-AT) and adjusted for price differences in Inuit Nunangat and southern Canada,[44] was used in place of household income quintiles. This with labour force status, level of education, marital status and size of community accounted for 47% of excess risk of suicide among Inuit, somewhat similar to what was seen with household income quintiles (40%). Among Métis, labour force status appeared to account for a smaller proportion of the excess risk than in the case of First Nations people and Inuit. This could be because the labour force status profile of Métis was somewhat similar to that of non-Indigenous people (Appendix Table A.5). Also, it should be noted that the socioeconomic factors included in the models in this study do not account for all the factors that can affect risk of suicide such as marginalization and other effects of colonization such as forced relocation to permanent settlements; residential school attendance; family history of suicide and violence; intergenerational trauma; historical and contemporary social inequities; gaps in access to health services among other factors.[1,4, 12] Further, it does not account for other previous-identified factors associated with suicide among Inuit including childhood abuse, family and personal histories of major depressive disorder, and a history of some personality disorders, impulsive and aggressive traits and substance dependence.[15] It also does not account for other determinants of Inuit mental health such as pride in Inuit identity, living in a community with more positive social interaction and ease of hunting.[45] In examining these numbers, it is important to note that only those who survived to age 25 are analyzed here to enable examining the role of labour force status, education and marital status. It is possible that this group may have different characteristics than those that did not survive to this age. However, these findings are in line with previous reports that suggested that unemployment and poverty are associated with suicide.[26-29,45,46] Specifically, Mehl-Madrona reported that suicide attempts were preceded by high level of "unremitting, chronic life stress (including poverty) with relative isolation."[46] And, the review by the Office of the Chief Coroner of Ontario of the suicides in a remote First Nations community in Ontario suggested that social determinants of health may play a greater role in preventing suicides than availability and accessibility of health services. These include proximal determinants such as employment, income, education and food security, and distal determinants such as colonialism, racism, social exclusion and lack of self-determination opportunities.[37]

Methods

Data

The 2011 Canadian Census Health and Environment Cohort (CanCHEC) used here is a population-based integrated dataset that follows the non-institutional (household) population enumerated in the 2011 National Household Survey (NHS) for different health outcomes such as mortality, cancer, and hospitalizations. Briefly, record integration for the 2011 CanCHEC was carried out using Statistics Canada's Social Data Linkage Environment (SDLE).[47] The SDLE helps create linked population data files for social analysis through integration 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 integration software that supports deterministic and probabilistic integration.

The NHS is a voluntary survey, conducted in May 2011, of approximately 4.5 million (30%) private dwellings randomly selected from the 2011 Census of Population. The NHS covers all persons who usually live in Canada, including permanent and non-permanent residents, and individuals living on First Nations reserves, Métis settlements or Inuit communities. There were 36 incompletely enumerated First Nations reserves in the 2011 NHS.

In 13 of these communities, enumeration was delayed because of forest fires in Northern Ontario and occurred at a later date. The NHS excludes residents of institutions (for example, hospitals, nursing homes, penitentiaries) and collective dwellings (for example, work camps, hotels, shelters).[47]

Records for approximately 6.7 million NHS respondents were eligible for integration; 97% linked to the DRD using a probabilistic approach based on telephone number, surnames, given names, birthdate, and place of residence. No differences in integration rates were found by collection mode, province, sex, or birth decade. To ensure representativeness of the linked cohort, weights were calculated to adjust for non-integration.[47]

To protect the confidentiality of Census respondents, data made available for analysis did not contain personal identifiers such as name, and address. In addition, estimates based on small cell counts (fewer than five deaths or fewer than 10 total individuals) were suppressed.

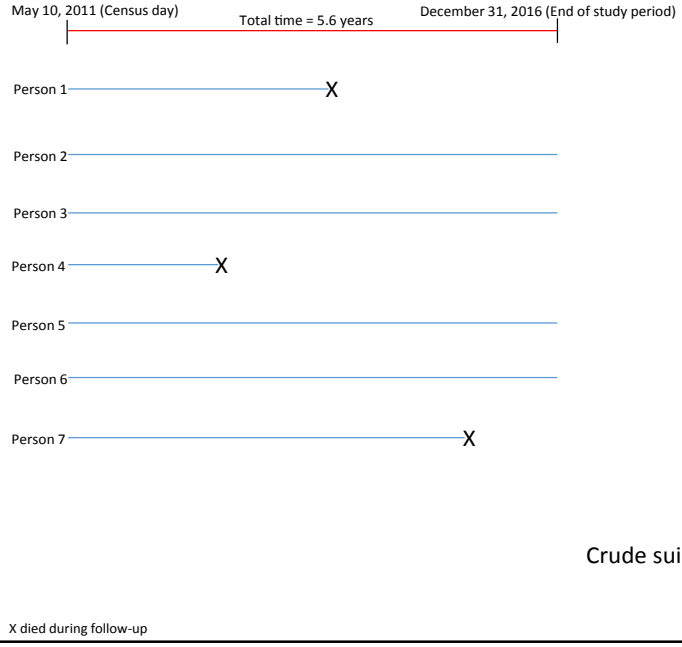
Variables

Self-reported Indigenous identity, age, sex, household income, labour force status, highest level of education, marital status and province of residence variables were available in the 2011 NHS dissemination dataset. Variables for the Inuit Nunangat regions were generated using Standard Geographical Classification (SGC) codes. Similarly, a variable for on and off-reserve areas of residence was generated using SGC. A binary suicide variable was created using ICD-10 codes in the "Underlying cause of death" variable in the CVSD. Generation of suicide and person-years at risk variables are described in the following section.

Estimation of weighted suicide rates

For suicide rate estimates, each person's time at risk of death by suicide was split into single years of follow-up, and within each year of follow-up, into durations before and after birth date. In the process, each person was aged on his or her birthday. This allows for the appropriate categorization into age groups for computing suicide rates. Weighted age-standardized suicide rates (ASMRs) (see figure 1 for a brief description of this measure) and their 95% confidence intervals were estimated. Those under the age of one were excluded from the analysis due to under-representation of this group in the integrated dataset. Briefly, ASMRs were computed by dividing the count of cohort members who died by suicide in the follow-up period by the total person-years at risk. Age standardization was done with age-specific mortality rates in 5-year age groups using the 2011 total Indigenous population as the reference population. Weighted age-specific suicide rates generated without age standardization were used for comparisons between age groups within an Indigenous group or between an Indigenous group and the non-Indigenous population. These rates were also used to compare suicide rates in the on and off-reserve First Nations populations since their age structures were somewhat similar in 2011 (median age: 23.9 and 27.1 years, respectively).[48] Suicides were identified using the following International Statistical Classification of Diseases and Related Health Problems 10th Revisions (ICD-10) codes: X60-X84, Y87.0. For each member of the cohort, person-years of follow-up were calculated as the number of days from the beginning of the study period to the date of death or end of study divided by 365.25. Variance was calculated using 500 bootstrap weights.

Figure 1
A schematic of the method for generating suicide rates with person-years as the denominator using a hypothetical example



Dead/Alive at end of study	Years contributed
Dead	3.0
Alive	5.6
Alive	5.6
Dead	1.5
Alive	5.6
Alive	5.6
Dead	4.2
Total 3	31.1

Crude suicide-related mortality rate = 3/31.1 x 100,000

= 9646.3 deaths per 100,000 person-years of follow-up

Age-standardized and age-specific suicide rates, expressed as the number of deaths by suicide per 100,000 person-years at risk, were generated by sex, Indigenous identity and select geographic areas. Indigenous identity, as self-reported in the 2011 NHS Survey, included: First Nations, Métis, Inuit, Multiple Indigenous identity, Indigenous identity responses not indicated elsewhere and non-Indigenous. However, in this paper, only estimates for single identity groups are presented. Geographic areas studied include: province/territory; on or off-reserve; rural areas or small, medium and large population centres, and for Inuit, inside/outside Inuit Nunangat and by the four regions of Inuit Nunangat (Nunatsiavut, Nunavik, Nunavut, and the Inuvialuit region), as well as outside Inuit Nunangat. Rate ratios, or the ratio of suicide rate among First Nations people, Métis or Inuit over suicide rate among non-Indigenous people were computed to examine the magnitude of disparity in the Indigenous group compared to the non-Indigenous population. To estimate variance of the rate ratios, variance and covariance of the mortality rates in the Indigenous group of interest and non-Indigenous population were estimated using PROC RATIO in SAS-callable SUDAAN. Variance of the rate ratios was then computed using Taylor linearization and the variance and covariance estimates from PROC RATIO, and used in generating 95% confidence intervals.

Hypothesis testing was done to identify suicide rates that were significantly different from one another using $p<0.05$. The weighted number of suicides and suicide rates were not published if (1) the unweighted number of suicides in a cell was less than five, (2) the weighted population count in the cell were less than 10, or (3) coefficient of variance (CV) was greater than 33.3% (40% for those under 15 years). Weighted numbers of suicides were also randomly rounded to base five. ASMRs with CV greater than 16.6% and less than or equal to 33.3% are presented with an "E" to indicate that these should be used with caution.

Estimation of suicide rate by First Nations band

For estimating suicide rates by First Nations band, reserve CSDs associated with each band were grouped. Reserves that were shared by multiple bands were grouped separately. This was done for seven reserves. Three of these had a population of 10 or less. And, one was incompletely enumerated in the 2011 NHS. This grouping resulted in about 600 First Nations bands. Of these, 561 included individuals that were in the 2011 CanCHEC. Others were associated with reserves that were incompletely enumerated in the 2011 NHS or had participated in the 2011 Census and not the NHS. In the end, 555 bands were included in the analysis. Suicide rates were computed by First Nations band,

from which the number and percentage of bands with a reportable zero suicide rate were identified. The percentage of bands with a zero suicide rate were calculated with and without the reserves that were associated with multiple bands and were found to be similar.

Multivariate analysis

To examine the role of socioeconomic and geographic factors in the excess risk of suicide among Indigenous people relative to non-Indigenous people, Cox proportional hazards modelling was performed. Analyses were restricted to those 25 years and older to allow for the use of labour force status, level of education and marital status as covariates. For this analysis, age at baseline on Census day, was used since other covariates also had the same reference period. Hazard ratios for suicide were estimated among First Nations people, Métis and Inuit (with non-Indigenous people as the reference group). Covariates were entered sequentially into the model in this order: age group together with sex, household income quintile (based on after-tax income adjusted for economic family size), labour force status (employed, unemployed and not in the labour force), highest level of education (less than high school, high school, post-secondary education below Bachelor's level and university degree), marital status (never legally married or single, legally married and not separated, separated but still legally married, divorced or widowed) and living on or off reserve (for First Nations people) or in population centres or rural areas (for Métis and Inuit). Household income quintiles were generated for each province and territory separately to account for regional differences. In secondary analysis, household income was used as a continuous variable or household income quintiles were generated at the national level and used in place of the original income quintile variable to examine the robustness of the influence of this predictor on the relative risk of death by suicide among First Nations people, Métis and Inuit. Covariates were chosen based on previous literature on the relationship between socioeconomic factors and suicide.[26-29,45] and the availability of related variables in the 2011 NHS data.

From the hazard ratios (age and sex-adjusted and additionally adjusted for socioeconomic factors), the percent of excess risk of suicide among First Nations, Métis and Inuit people accounted for by household income, labour force status, highest level of education, marital status and geography was computed. The proportion of excess mortality explained was calculated as the difference between the age and sex-adjusted and the final hazard ratios, divided by the former minus 1.[7] Analyses were not carried out separately by sex due to sample size limitations.

Assessing validity of suicide rates

Suicide rates based on the linked 2011 CanCHEC cohort were compared with previously generated estimates using different methodologies to assess validity.

The non age-standardized suicide rate for the total population of Canada between 2009 and 2013 was previously estimated to be 11.4 deaths per 100,000 people;[49] in comparison, in the CanCHEC cohort, the overall suicide rate was 10.5 deaths per 100,000 person years between 2011 and 2016. While there are no published rates of suicide for First Nations people, Métis and Inuit for the 2011 to 2016 period, suicide rates for all individuals in Inuit Nunangat, which is home to 73% of Inuit in Canada, was previously estimated to be 83.5 deaths per 100,000 people.[49] In the 2011 CanCHEC cohort, the rate was 83.5 deaths per 100,000 person years at risk. However, the estimates by Inuit Nunangat region between 2011 and 2016 (167.3[E] in Nunatsiavut, 87.5 in Nunavik and 83.1 in Nunavut) were somewhat different in comparison to previous estimates from the 2009 to 2013 period (185.4, 98.3, 79.0, respectively). While, the estimates are similar, there are several potential reasons for this discrepancy between the two sets of estimates. While there is some overlap in time periods for the two estimates (2009 to 2013 for previous estimates and 2011 to 2016 for the estimates in this report), they are not identical. There is some year-to-year fluctuation in suicides rates. For example, in Nunavut, previous estimates suggest that the rate ranged from 58.2 to 108.5 deaths per 100,000 people. Some deaths that occurred between 2011 and 2016 were not linked to the 2011 NHS. Also, the CanCHEC cohort excludes institutional population (e.g., nursing homes, jails), and those living in collective dwellings (e.g., motels, hotels, rooming houses) at the time of census collection and those that were not enumerated by the 2011 NHS. The denominators used in the two studies are also different; in the previously published tables, the suicide rates are per 100,000 people; in the current study, the rates are per 100,000 person years.

Limitations

Several limitations of the analysis should be noted. Suicide rates presented in this article may underestimate the true rates because of (1) exclusion of the institutional population and population living in collective dwelling, (2) exclusion of persons not enumerated by the 2011 NHS including the homeless among whom Indigenous people are overrepresented,[50] (3) non-integration of some deaths between 2011 and 2016 to the 2011 NHS, (4) potential integration error, (5) potential misclassification of suicides in the CVSD to avoid stigmatization or as a result of misclassification as an accident, or inability in ascribing a cause, etc., and (6) potentially missing deaths, due to processing delays, in Vital Statistics at the time of data integration.[11] Furthermore, Indigenous identity in the Census is self-reported, which may have led to underestimation or overestimation of suicide rates in some Indigenous groups. Also, 36 Indian reserves and Indian settlements were incompletely enumerated in the 2011 NHS,[34] which could have resulted in under or overestimation of suicide rates. Most (29) of these reserves were in Québec and Ontario, with the rest in Saskatchewan, Alberta and British Columbia. Among the ones in Québec and Ontario, some are proximal to Census Metropolitan Areas (CMA) while others were rural or remote. The former includes Kahnawake, Kanesatake and Wendake.[34] Mortality rates 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 by suicide. Finally, baseline socioeconomic and demographic factors used in the multivariate analysis may not reflect conditions at the time of death. This may have led to some biases in the findings.

Appendix

Table A.1
Age-specific suicide rates (number of deaths by suicide per 100,000 person-years at risk) and rate ratios (RR) among First Nations people, Inuit and non-Indigenous people in Canada, by sex, household population aged 1 year or older, Canada, 2011-2016

	First Nations people			Inuit			Non-Indigenous people			First Nations people			Inuit		
		95% confidence interval			95% confidence interval			95% confidence interval			95% confidence interval			95% confidence interval	
Age group	Suicide-rate	lower	upper	Suicide-rate	lower	upper	Suicide-rate	lower	upper	Rate ratio	lower	upper	Rate ratio	lower	upper
Total (1 year or older)															
Females	19.9	14.7	25.0	38.4	26.1	50.6	4.7	4.2	5.2	4.2	3.0	5.4	8.1	5.5	10.8
Males	30.5	25.0	36.1	115.6	95.0	136.1	15.1	14.3	16.0	2.0	1.6	2.4	7.6	6.2	9.1
1 to 14 years															
Females	5.4[E]	2.9	7.9	F	F	F	F	F	F	…	…	…	…	…	…
Males	1.9[E]	0.6	3.3	F	F	F	0.5[E]	0.1	0.8	4.2	-0.1	8.6	…	…	…
15 to 24 years															
Females	40.3[E]	25.8	54.8	79.2[E]	42.8	115.6	3.3	2.3	4.4	12.0	6.4	17.6	23.7	10.4	36.9
Males	56.6	40.3	73.0	289.7	219.3	360.0	11.9	9.8	14.0	4.8	3.2	6.4	24.4	16.9	31.8
25 to 34 years															
Females	F	F	F	58.5[E]	25.7	91.4	4.2	3.0	5.4	…	…	…	13.9	5.5	22.4
Males	48.4	34.0	62.8	182.3	125.2	239.4	14.3	12.2	16.5	3.4	2.3	4.5	12.7	8.4	17.1
35 to 44 years															
Females	F	F	F	F	F	F	5.2	3.9	6.5	…	…	…	…	…	…
Males	45.9[E]	18.8	73.0	92.3[E]	36.9	147.7	18.2	15.5	20.8	2.5	1.0	4.1	5.1	1.9	8.2
45 to 54 years															
Females	F	F	F	F	F	F	8.3	6.5	10.1	…	…	…	…	…	…
Males	32.8[E]	19.9	45.7	F	F	F	21.9	19.1	24.8	1.5	0.9	2.0	…	…	…
55 years or older															
Females	6.9[E]	2.5	11.4	F	F	F	5.2	4.3	6.1	1.3	0.5	2.2	…	…	…
Males	11.5[E]	6.9	16.0	F	F	F	18.9	17.1	20.7	0.6	0.4	0.9	…	…	…

… not applicable
[E] use with caution
F too unreliable to be published

Notes: 5.6-year follow-up period: May 10, 2011 to December 31, 2016.
Age-specific mortality rates for Métis could not be generated because of small cell counts, and to meet the reliability and confidentiality requirements..
Excluded from data: institutional population at time of census collection (e.g. nursing homes, jails), population living in collective households (e.g. motels, hotels, rooming houses), persons not enumerated by the 2011 National Household Survey.
Source: Statistics Canada, 2011 Canadian Census Health and Environment Cohort integrating the 2011 National Household Survey with Canadian Vital Statistics Database (2011-2016).

Table A.2
Age-specific suicide rates (number of deaths by suicide per 100,000 person-years at risk) and rate ratios (RR) among First Nations people living on and off reserve and non-Indigenous people in Canada, by sex, household population aged 1 year or older, Canada, 2011-2016

	First Nations people living on reserve			First Nations people living off reserve			Non-Indigenous people			First Nations people living on reserve			First Nations people living off reserve		
		95% confidence interval			95% confidence interval			95% confidence interval			95% confidence interval			95% confidence interval	
Age group	Suicide-rate	lower	upper	Suicide-rate	lower	upper	Suicide-rate	lower	upper	Rate ratio	lower	upper	Rate ratio	lower	upper
Total (1 year or older)															
Females	26.0	21.4	30.6	16.5[E]	9.2	23.8	4.7	4.2	5.2	5.5	4.5	6.5	3.5	1.9	5.0
Males	42.1	37.0	47.3	23.0[E]	14.9	31.2	15.1	14.3	16.0	2.8	2.4	3.1	1.5	1.0	2.1
1 to 14 years															
Females	10.6[E]	6.1	15.1	F	F	F	F	F	F	…	…	…	…	…	…
Males	4.7[E]	1.5	8.0	F	F	F	0.5[E]	0.1	0.8	10.4	3.2	17.6	…	…	…
15 to 24 years															
Females	52.9	40.0	65.7	F	F	F	3.3	2.3	4.4	15.8	11.7	19.8	…	…	…
Males	78.8	63.6	94.1	42.6[E]	18.3	66.8	11.9	9.8	14.0	6.6	5.3	7.9	3.6	1.5	5.6
25 to 34 years															
Females	44.1[E]	28.7	59.6	F	F	F	4.2	3.0	5.4	10.5	6.9	14.1	…	…	…
Males	70.5	53.3	87.8	34.3[E]	13.3	55.2	14.3	12.2	16.5	4.9	3.8	6.0	2.4	0.9	3.9
35 to 44 years															
Females	19.2[E]	10.4	28.0	F	F	F	5.2	3.9	6.5	3.7	1.9	5.4	…	…	…
Males	60.9	43.5	78.2	F	F	F	18.2	15.5	20.8	3.4	2.3	4.4	…	…	…
45 to 54 years															
Females	24.1[E]	12.4	35.8	F	F	F	8.3	6.5	10.1	2.9	1.5	4.3	…	…	…
Males	29.8[E]	16.9	42.7	34.7[E]	15.6	53.7	21.9	19.1	24.8	1.4	0.8	1.9	1.6	0.7	2.4
55 years or older															
Females	F	F	F	F	F	F	5.2	4.3	6.1	…	…	…	…	…	…
Males	26.1[E]	15.2	37.1	F	F	F	18.9	17.1	20.7	1.4	0.7	2.0	…	…	…

… not applicable
[E] use with caution
F too unreliable to be published

Notes: 5.6-year follow-up period: May 10, 2011 to December 31, 2016.
Excluded from data: institutional population at time of census collection (e.g. nursing homes, jails), population living in collective households (e.g. motels, hotels, rooming houses), persons not enumerated by the 2011 National Household Survey.
Source: Statistics Canada, 2011 Canadian Census Health and Environment Cohort integrating the 2011 National Household Survey with Canadian Vital Statistics Database (2011-2016).

Table A.3
Age-specific suicide rates (number of deaths by suicide per 100,000 person-years at risk) and rate ratios (RR) among Inuit in Inuit Nunangat and non-Indigenous people in Canada, by sex, household population aged 1 year or older, Canada, 2011-2016

	Inuit in Inuit Nunangat			Non-Indigenous people			Inuit in Inuit Nunangat		
		95% confidence interval			95% confidence interval			95% confidence interval	
Age group	Suicide rate	lower	upper	Suicide rate	lower	upper	Rate ratio	lower	upper
Total (1 year or older)									
Females	49.6	34.9	64.3	4.7	4.2	5.2	10.5	7.3	13.7
Males	142.7	118.3	167.0	15.1	14.3	16.0	9.4	4.5	14.4
1 to 14 years									
Females	F	F	F	F	F	F	…	…	…
Males	F	F	F	0.5[E]	0.1	0.8	…	…	…
15 to 24 years									
Females	108.9[E]	59.1	158.6	3.3	2.3	4.4	32.5	14.2	50.9
Males	363.2	274.1	452.3	11.9	9.8	14.0	30.5	21.1	40.0
25 to 34 years									
Females	79.3[E]	34.8	123.8	4.2	3.0	5.4	18.9	7.0	30.8
Males	232.3	160.0	304.6	14.3	12.2	16.5	16.2	10.6	21.9
35 to 44 years									
Females	F	F	F	5.2	3.9	6.5	…	…	…
Males	85.7[E]	33.6	137.7	18.2	15.5	20.8	4.7	1.8	7.6
45 to 54 years									
Females	F	F	F	8.3	6.5	10.1	…	…	…
Males	F	F	F	21.9	19.1	24.8	…	…	…
55 years or older									
Females	F	F	F	5.2	4.3	6.1	…	…	…
Males	F	F	F	18.9	17.1	20.7	…	…	…

... not applicable

[E] use with caution

F too unreliable to be published

Notes: 5.6-year follow-up period: May 10, 2011 to December 31, 2016.
Excluded from data: institutional population at time of census collection (e.g. nursing homes, jails), population living in collective households (e.g. motels, hotels, rooming houses), persons not enumerated by the 2011 National Household Survey.
Source: Statistics Canada, 2011 Canadian Census Health and Environment Cohort integrating the 2011 National Household Survey with Canadian Vital Statistics Database (2011-2016).

Table A.4
Adjusted relative risk of suicide (hazard ratio [HR]) among First Nations people, Métis, Inuit, household population aged 25 years or older, Canada, 2011

	First Nations people[†]			Métis[†]			Inuit[†]		
		95% confidence interval			95% confidence interval			95% confidence interval	
Adjusted for	Hazard ratio	lower	upper	Hazard ratio	lower	upper	Hazard ratio	lower	upper
None	1.99	1.57	2.52	1.95	1.25	3.03	4.72	3.49	6.38
Step 1: Age and sex	2.04	1.61	2.57	1.94	1.25	3.02	4.75	3.51	6.42
Step 2: plus household income	1.68	1.33	2.12	1.83	1.18	2.86	4.35	3.21	5.88
Step 3: plus labour force status	1.58	1.25	2.00	1.81	1.16	2.82	4.00	2.95	5.42
Step 4: plus level of education	1.49	1.17	1.89	1.72	1.11	2.68	3.71	2.72	5.06
Step 5: plus martial status	1.35	1.06	1.72	1.61	1.03	2.51	3.38	2.48	4.62
Step 6: plus on/off-reserve geography (First Nations) or population centre type (Métis and Inuit)	1.23	0.83	1.80	1.59	1.02	2.47	3.26	2.39	4.46

[†] reference is the non-Indigenous population

Notes: 5.6-year follow-up period: May 10, 2011 to December 31, 2016.
Excluded from data: institutional population at time of census collection (e.g. nursing homes, jails), population living in collective households (e.g. motels, hotels, rooming houses), persons not enumerated by the 2011 National Household Survey.
Source: Statistics Canada, 2011 Canadian Census Health and Environment Cohort integrating the 2011 National Household Survey with Canadian Vital Statistics Database (2011-2016).

Table A.5
Distribution of select socioeconomic and demographic characteristics among First Nations people, Métis, Inuit and non-Indigenous people in Canada at baseline, household population aged 25 years or older, Canada, 2011

	First Nations people			Métis			Inuit			Non-Indigenous people		
		95% confidence interval			95% confidence interval			95% confidence interval			95% confidence interval	
	Percent	lower	upper	Percent	lower	upper	Percent	lower	upper	Percent	lower	upper
Household income quntiles												
Quntile 1 (poorest)	40.7	39.4	42.0	22.9	22.1	23.7	23.9	22.5	25.2	18.1	17.6	18.5
Quntile 2	20.7	20.3	21.1	20.9	20.4	21.4	22.4	21.3	23.6	19.2	19.1	19.3
Quntile 3	15.7	15.2	16.2	20.0	19.5	20.5	20.4	19.4	21.4	20.1	20.0	20.2
Quntile 4	12.9	12.4	13.3	19.4	18.9	19.9	18.8	17.9	19.8	20.8	20.6	20.9
Quntile 5 (richest)	10.1	9.7	10.5	16.8	16.3	17.3	14.5	13.6	15.4	21.9	21.7	22.0
Labour force status												
Employed	51.9	50.5	53.4	65.0	64.2	65.8	54.8	53.1	56.4	63.1	62.7	63.5
Unemployed	9.7	9.4	10.0	6.2	5.9	6.5	11.4	10.8	12.0	4.0	4.0	4.1
Out of the labour force	38.4	37.0	39.7	28.8	28.1	29.6	33.8	32.2	35.5	32.9	32.5	33.2
Highest level of education												
Less than high school	35.7	34.8	36.6	23.6	23.0	24.2	49.8	48.5	51.1	16.6	16.5	16.7
High school	21.1	20.7	21.5	23.4	22.8	24.0	15.5	14.6	16.5	23.0	22.9	23.0
Post-secondary education below bachelor's level	35.0	34.4	35.6	42.0	41.4	42.6	29.6	28.4	30.9	36.5	36.3	36.6
University or higher	8.2	7.9	8.6	11.0	10.6	11.4	5.0	4.3	5.9	24.0	23.9	24.0
Population centre type												
Rural	46.2	45.3	47.2	29.2	28.6	29.8	53.8	52.4	55.1	18.3	18.2	18.4
Small population centre	16.8	16.4	17.2	19.2	18.7	19.6	32.0	30.9	33.1	12.2	12.1	12.2
Medium population centre	8.8	8.5	9.2	11.1	10.7	11.4	2.5	1.8	3.3	8.7	8.7	8.8
Large population centre	28.2	27.6	28.8	40.6	40.0	41.2	11.8	10.6	13.1	60.8	60.6	61.0
Marital status												
Never legally married (single)	43.8	43.1	44.6	31.1	30.5	31.7	48.3	47.0	49.7	24.0	23.8	24.3
Legally married (and not separated)	36.0	34.8	37.3	46.9	46.0	47.8	37.7	36.1	39.3	56.3	55.7	56.9
Separated, but still legally married	5.6	5.4	5.9	5.3	5.0	5.6	3.5	3.0	4.0	3.3	3.3	3.4
Divorced	9.3	9.0	9.7	12.5	12.0	13.1	5.6	4.7	6.7	10.1	9.9	10.2
Widowed	5.2	4.9	5.5	4.1	3.9	4.4	4.8	4.4	5.4	6.3	6.1	6.4

Notes: Excluded from data: institutional population at time of census collection (e.g. nursing homes, jails), population living in collective households (e.g. motels, hotels, rooming houses), persons not enumerated by the 2011 National Household Survey.
Source: Statistics Canada, 2011 Canadian Census Health and Environment Cohort integrating the 2011 National Household Survey with Canadian Vital Statistics Database (2011-2016).

Table A.6
Age distribution of total Indigenous population, household population aged 1 year or older, Canada, 2011

Age group	Percent
1 to 4 years	7.93
5 to 9 years	9.16
10 to 14 years	9.48
15 to 19 years	10.12
20 to 24 years	8.41
25 to 29 years	7.15
30 to 34 years	6.49
35 to 39 years	6.39
40 to 44 years	6.70
45 to 49 years	7.04
50 to 54 years	6.45
55 to 59 years	4.92
60 to 64 years	3.74
65 to 69 years	2.55
70 to 74 years	1.70
75 to 79 years	0.97
80 to 84 years	0.51
85 years and over	0.30

Source: Statistics Canada, 2011 Census of Population.

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