THE EFFECT OF COMMUNITY-LEVEL FACTORS ON SUICIDE IN INUIT NUNANGAT*

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ABSTRACT / RÉSUMÉ

Suicide is an area of great concern to Inuit in Canada, yet there are no national statistical data to highlight this issue. Using a geographical approach, we look at suicide rates in Inuit regions over a fifteen-year period from 1989 to 2003. We then analyse these data to compare suicide rates between groups of communities based on a variety of community-level factors. Results indicate that suicide rates in these regions are over eleven times higher than the Canadian average throughout this period. Factors relating to social connections and networks appear to be associated with lower suicide rates.

Le suicide est un sujet très préoccupant pour les Inuits du Canada, bien qu'il n'y ait aucune donnée statistique nationale soulignant ce problème. Le présent article utilise une approche géographique pour examiner les taux de suicide dans les régions inuites sur une période de 15 ans allant de 1989 à 2003. On analyse ensuite ces données afin de comparer les taux de suicide des groupes de collectivités d'après divers facteurs au niveau de la collectivité. Les résultats indiquent que les taux de suicide dans ces régions sont plus de 11 fois plus élevés que la moyenne canadienne durant la même période. Les facteurs concernant les connexions et les réseaux sociaux semblent être associés à des taux de suicide plus faibles.

INTRODUCTION

Inuit live primarily in remote, northern communities in regions across Canada's Arctic, known collectively as Inuit Nunangat. In 2001, there were some 45,000 Inuit in Canada according to the Census, most of whom lived in one of 53 communities in four regions: Inuvialuit in the Northwest Territories, the Territory of Nunavut, Nunavik, in northern Québec, and Nunatsiavut, on the north coast of Labrador. All four of these regions have settled land claims, and three have formal agreements for Inuit-controlled government.

Recent research shows that suicide rates among Inuit in Canada are much higher than average. Various regional studies have found rates from around 3.5 to 11 times higher than the national average (Canada 1995; Hicks 2007a; Bobet 2004). Despite this, there is no consistent measurement of suicide rates across the four regions inhabited by Inuit, owing largely to the difficulty of separating the mortality data for Inuit from those of non-Inuit residents of the same areas. Differences in surveillance between provinces and territories make it difficult to produce a national suicide rate, or compare mortality patterns across regions.

Indian and Northern Affairs Canada, in conjunction with Statistics Canada and Health Canada, explored the feasibility of producing suicide statistics for Inuit-inhabited regions of Canada, following the methodology developed by Wilkins et al. (2008). This method uses a geographic coding methodology to calculate statistics for communities that have a high proportion of Inuit residents, as identified from the Census of Population, conducted by Statistics Canada.

Following the calculation of suicide rates for the period from 1989 to 2003, we compare suicide rates between groups of communities divided by differences in socio-cultural characteristics taken from the Census and the companion Aboriginal Peoples Survey (APS) conducted by Statistics Canada, in order to identify community characteristics that may be associated with higher and lower suicide rates.

RISK FACTORS AND THE EXPLANATION OF HIGH SUICIDE RATES

Risk factors for Inuit suicide might be divided into two general categories: mainstream risk factors that tend to be prevalent in Inuit society, and risk factors specific to Inuit (or more broadly Aboriginal) populations, such as colonization and acculturation. Many mainstream risk factors seen in non-aboriginal societies are also prevalent in Inuit communities, including childhood separation and loss, alcohol abuse, personal mental health problems, domestic dysfunction and exposure to other people's self-destructive behaviour (Boothroyd et al. 2001).

Besides these factors, there are potential risk factors that are specific to Aboriginal communities in general and Inuit communities in particular. Many researchers point to the rapid social and cultural change, social and economic marginalization, cultural suppression, political disempowerment and discrimination that come with a history of colonization and acculturation by Western European powers as risk factors specific to Inuit (Boothroyd et al. 2001; Kirmayer, Brass, and Tait 2000). Examples of this include forced relocation, the adoption of western-style goods (housing, food, clothing) which require Inuit to work for wages, and attendance at school which cuts Inuit youth off from the traditional teaching role of their parents/elders. Researchers link this loss of culture and its accompanying negative effects with loss of individual self-esteem, ultimately leading to disconnect with an individual's culture and community to the point where life can be seen as meaningless (Chandler and Proulx 2006). The effect of cultural change may also explain the higher rates of suicide among males, as some have suggested that the traditional domestic role of women is more easily transferred to the southern wage-based service economy, than the male role of hunting and fishing (Henderson 2003; Canada 2003a; Hunter and Milroy 2006).

Recently, researchers have been investigating the link between community characteristics and suicide rates. In one study, researchers found that rates of suicide in a group of First Nations communities in British Columbia varied widely, ranging from having many more suicides than expected, to having none during the study period. These communities with low or no suicide were those that were actively pursuing control of their own lands, including control over health, policing and education. The more examples of self-determination the community had, the lower the suicide rates (Chandler and Lalonde 1998).

Although these findings have helped shift the discussion to one of community characteristics and the local environment, it is not clear to what degree this paradigm applies to Inuit communities. All of the Inuit regions have settled land claims, some dating back as far as 1976, and retention of traditional language is strong, with Inuit languages remaining dominant in some regions, especially Nunavik and Nunavut. In addition, most Inuit regions now have a substantial amount of local government[1] (although this is a recent development in most cases). These factors would lead us to predict low suicide rates based on these findings, yet, as we will see below, the Inuit rates are far above Canadian levels, and rising.

THE GEOZONE METHODOLOGY

The methodology for extracting vital statistics for Inuit-inhabited areas was developed and described by Wilkins et al. (2008). Most Inuit live in isolated northern communities which can be identified by geographic codes present on the vital statistics records of all provinces and territories. This coding reflects the person's usual place of residence, making it possible to produce routine surveillance data for Inuit-inhabited areas – that is, for **all** residents of communities that have substantial Inuit populations, regardless of the place of occurrence of the death.

To determine Inuit-inhabited communities, we used a cut-off of 33% Inuit inhabitants according to the 2001 Census of Population, following Wilkins et al. (2008). While this sounds low, most communities above this cut-off had a much higher proportion of Inuit inhabitants, and it included all 53 communities within the Inuit land claim areas.[2] The final list included:

- 6 communities in the Inuvialuit Settlement Region;
- 28 communities in Nunavut (plus 2 "unorganized areas" around the communities that shared the same postal codes);
- 14 communities in Nunavik;
- 6 communities in Labrador/Nunatsiavut.

In the parts of the study that involved combining mortality data with explanatory variables from the Aboriginal Peoples Survey (APS), this list had to be reduced slightly, since five of these communities were missing from the APS sample.

As a consequence of using a geographic-based approach, about 21% of the total population covered is non-Inuit, though this proportion varies from region to region (see Table 1). Importantly, though, this method captured nearly 80% of the total Inuit population in Canada.

Most non-Inuit living in the North tend to be better educated, employed, paid and housed than their Inuit neighbours (see Table 2). It would be expected that the non-Inuit population would also have better health outcomes than the local Inuit population. Hicks (2007a) reported that of 221 suicides in Nunavut from 1999 to 2006, only 3 involved non-Inuit. As a result of this, we believe that our estimates of suicide rates in these communities underestimate the actual Inuit suicide rates. It is also possible, however, that Census under coverage of the population could lead to overestimation, but on the whole, we feel that the suicide rates presented here are conservative. Additionally, this geographic method misses about 20% of the Inuit population, who live outside the land claim areas.

METHODS FOR THE ANALYTICAL PORTION OF THE STUDY

In the analytical portion of this study, we grouped communities according to explanatory variables, and then calculated suicide rates for these groupings. For example, we compared suicide rates in the group of communities in which school attendance was high to rates in the group of communities where attendance was low. Explanatory variables were drawn from two sources: the 1996 Census and the 2001 Aboriginal Peoples Survey (APS) with the choice of variables being based on the literature. The final list included basic socio-demographic variables, measures of tradition and language, and measures of community function and well-being.

The data covered the 15 years from 1989 to 2003, with suicide rates standardized to the age distribution of the Inuit population in 2001. Census data on community characteristics were drawn from the 1996 Census, the midpoint of the 15-year period studied. There was no Aboriginal Peoples Survey in 1996, but the 2001 version contained an Arctic Supplement that provided valuable information on participation in traditional activities and community conditions.[4] In both cases, data were extracted for the population who reported Inuit identity. This means that although the suicide rates are for the entire population, both Inuit and non-Inuit, of the selected communities, the explanatory variables are based only on people who identified as Inuit. The rationale for this decision was to identify possible explanatory variables for Inuit suicide rates, since other

TABLE 1: Inuit-inhabited Areas, 1996[3] Population by Stated Identity

	INUIT SINGLE-IDENTITY		ALL OTHER IDENTITIES		TOTAL POPULATION
	NUMBER	%	NUMBER	%	
Nunatsiavut (Lab)	2,309	68.1	1,080	31.9	3,389
Nunavik (QC)	7,628	88.0	1,069	12.0	8,697
Nunavut	20,489	83.1	4,176	16.9	24,665
Inuvialuit (NWT)	3,199	55.5	2,561	44.5	5,760
Total	33,625	79.1	8,886	20.9	42,511

TABLE 2: Population Characteristics Compared: Canada, Inuit-inhabited Areas, and Inuit Living in Inuit Areas, 2001 Census Data

CHARACTERISTIC	CANADA	INUIT-INHABITED AREAS	INUIT-IDENTITY POPULATION OF THESE AREAS (SINGLE OR MULTIPLE IDENTITY)
% under 15 years	19.4	36.6	40.3
% < high school diploma	31.1	51.4	62.0
% with some university	25.8	12.2	3.2
% unemployed	7.3	16.9	22.4
Avg household size	3.6	5.1	5.4
Avg income per person	$23K	$15K	$11K

Reproduced from Wilkins et al. 2007

sources suggest that up to 98% of the suicides in these areas occur among Inuit.

Since the absolute numbers of suicides involved are fairly small, the explanatory variables were simply dichotomized, in order to preserve confidentiality. For purposes of this analysis, we compared communities that were notably "strong" on a given characteristic to all the remaining ones, rather than dividing at some point such as the median. Thus we typically compared communities in the top quartile (e.g., the quarter that had the highest proportions of youth in school) to the communities in the remaining three quarters. Some exceptions were made if there was an analytical reason to cut at a different point, or if cutting at the top quartile resulted in too small a group.

PATTERNS OF SUICIDE IN INUIT-INHABITED AREAS

Even slightly understated, the geographic-based figures still show that the Inuit suicide rate, at 112 per 100,000 from 1999 to 2003, is many times the Canadian average of 10 deaths per 100,000 population. As seen in Figure 1 below, suicide rates are highest in Nunavik, followed by Nunatsiavut, Nunavut and then Inuvialuit.

A look at the trends over time confirms for all four Inuit-inhabited areas what studies in Nunavut and Nunavik had already observed: suicide rates have increased over the past 15 years. Judging by the figures for all regions combined, the increase from the 1994 to 1998 to the 1999 to 2003 period was particularly pronounced. All four regions saw statistically significant increases between the beginning and end points of the entire 15 year period.

Looking at differences by age and sex, these estimates show that young males make up the majority of deaths by suicide in the Inuit-inhabited areas. Over the 15 years covered in this study, over 80% of suicides were males and almost two thirds (65%) involved people under the age of 25.

FIGURE 1: Suicide Rates in Inuit Nunaat, 1989 to 2003

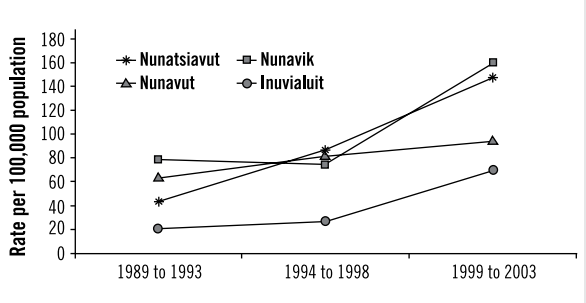
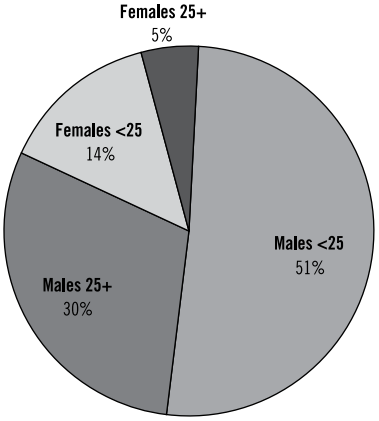


FIGURE 2: Suicides by Sex and Age Group, Inuit-inhabited Regions of Canada, 1989 to 2003



FACTORS RELATED TO SUICIDE IN INUIT-INHABITED AREAS

As mentioned above, our objective for this study was to see whether groups of communities classified by various community characteristics revealed variations in suicide

TABLE 3: Inuit Suicide Rates (Age-Standardized) by Region and Time Period, 1989 to 2003

		RATES PER 100,000 POPULATION		
		RATE	LOWER CI	UPPER CI
Nunatsiavut (Lab)	1989-1993	44.8 [1]	16.9	72.6
	1994-1998	87.5	41.7	133.4
	1999-2003	**147.7** [1]	**89.4**	**206.0**
Nunavik (QC)	1989-1993	79.0 [3]	52.2	105.7
	1994-1998	76.0 [2]	50.8	101.2
	1999-2003	**159.8** [2,3]	**125.0**	**194.6**
Nunavut	1989-1993	64.2 [4]	49.3	79.1
	1994-1998	80.7	64.9	96.5
	1999-2003	**95.6** [4]	**78.9**	**112.3**
Inuvialuit (NWT)	1989-1993	21.7 [6]	5.4	38.0
	1994-1998	26.8 [5]	8.1	45.5
	1999-2003	**69.9** [5,6]	**38.5**	**101.2**
All regions	1989-1993	59.6 [8]	49.0	70.1
	1994-1998	73.2 [7]	61.7	84.6
	1999-2003	**112.3** [7,8]	**98.4**	**126.1**

Superscripts indicate that a number is significantly different from the second figure with the same superscript.All rates standardized to the Inuit population

rates. The choice of variables was inspired by the literature, tempered by the indicators available on the Aboriginal Peoples Survey and Census. Topics covered included education, employment, tradition, culture, social and civic activities and perceptions of community problems.

Comparative suicide rates for these community groupings produced a variety of results. In some cases, differences in suicide rates indicated what we would logically expect based on the literature, as well as based on common perceptions of the causes of suicide. In other cases the results yielded no statistically significant differences between the two groups. For a third group of variables, however, our results indicated an association between community factors and suicide rates in the opposite direction to what one might expect.

ASSOCIATED VARIABLES

As one might expect in relatively small towns and hamlets, one of the lowest suicide rates was in communities where a high proportion of residents reported having close ties to family members in their community. This suggests an affirmation of the value of social support networks. Further to this, suicide was lower in communities with a high proportion of youth school attendance, and lower in communities with a higher employment rate, which is similar to what one might expect to see in the general population (Daniel et al. 2006; Kirmayer et al. 2007). Additionally, rates were lower in communities with a high proportion of residents who spent at least one month a year out on the land. These three activities each provide the means or the opportunity for individuals to be productive members of the economy, either traditional or modern, but they also provide social support networks that we might expect to act as a protective factor.

Suicide rates were higher in two other groups of communities- those where more people reported unemployment to be a problem in their community, and where people reported suicide to be a problem in their community (the latter association being one of the strongest in the analysis). While it seems logical and expected that respondents were seemingly aware of these issues and accurately reported them to interviewers, other questions on perceived problems in the community produced some rather unexpected results (see below).

UNASSOCIATED VARIABLES

There were several variables for which the difference in suicide rates was not statistically significant. One of these was frequent heavy drinking. Alcohol use has been associated with increased suicide risk, and it is surprising that we found no link between frequent binge drinking and suicide. Additionally, there was no link between suicide and communities where people considered either drug use or sexual abuse to be problems.



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UNEXPECTED RESULTS

For some community variables, results ran counter to what one might expect. Suicide rates were lower in communities where family violence was identified as a problem, as well as in communities where alcohol use was reported as a problem (all differences were statistically significant). These results contradict risk factors mentioned in the literature, as well as our reasonable expectation. One might argue that these results cast doubt on the reliability of the information on perceived community problems, but respondents reliably reported on suicide as an issue in communities where rates were indeed notably higher.

Two other factors that were unusually associated with higher suicide rates involve cultural practice factors generally considered protective factors for suicide. Rates were higher in communities with a high proportion of Inuktitut speakers, as well as in communities with a high proportion of people reporting having harvested country food in the past year. It is not possible within the scope of the present study to explain these intriguing results, but one should note that those individuals committing suicide are not necessarily those that speak Inuktitut or harvest country food. One might speculate that not speaking the traditional language or participating in traditional Inuit activities in a community where such things are common may actually be associated with suicidal behaviour.

DISCUSSION

This study has demonstrated that it is possible to extract suicide data for communities with substantial Inuit populations based on a geographic methodology. The rates calculated from these data may be considered conservative because of the number of non-Inuit included in the numbers. Nonetheless, we can see suicide rates many times that of the general Canadian population, rates which have increased dramatically over the 15-year period of study.

As demonstrated in the present study, one of the advantages of extracting data by this method is the potential to link to other data sources, thus opening up many possibilities for analysis. We have taken advantage of the common geographic approach to group communities

according to variables on the Census and the Aboriginal Peoples Survey, and to compare the suicide rates by different groupings of communities.

The results of this study indicate that some of the relationships between suicide risk and explanatory variables are more complex than they appear. Although a number of factors were associated with lower or higher suicide rates in ways that we might expect, there were others that showed the opposite association.

Suicide is influenced by social factors, yet it is ultimately an individual decision. This is seen clearly in a number of the community variables studied here, none more so than the inconsistent results from the questions of perceived community problems. The differing results yielded by these variables highlight the limits of such a geographic approach in looking at suicide, while other variables, such as family connections and time spent out on the land would appear to indicate the protective value of these community characteristics. The ambiguous links between suicide rates and measures of tradition argue for a more nuanced view of acculturation, as reflected in recent theories that postulate that suicide is linked to cultural transition rather than to acculturation *per se* (Hicks 2007b). According to these theories, communities that are either soundly *traditional* or soundly *westernized* would have less suicide than a culture in flux, where the stress of coping with change leads to more suicidal behaviour.

CONCLUSION

This study has demonstrated that, in the absence of a Canada-wide Inuit identifier on vital statistics or a data linkage program, it is still possible to obtain meaningful mortality data on suicide in Inuit communities. This study showed elevated and rising suicide rates in all Inuit regions of Canada, thus corroborating past studies in specific regions. This study has also helped to identify a number of community factors related to suicide which are worth further investigation.

All of the results have to be interpreted with caution; these suicide rates must be considered conservative in comparison to the suicide rate of the Inuit population. An analysis restricted to data for Inuit alone might produce somewhat different results, but this is not feasible with the geography-based method. Based on the results of this initial exploration, further studies could focus on indicators of social networks, employment, schooling, and tradition. They could also take a closer look at the role of such indicators as the retention of traditional language and way of life, which, contrary to expectation, do not appear to be associated with lower suicide rates in a community.

NOTE

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FOOTNOTES

[1] Nunatsiavut (Labrador) has had formal-recognized local government since December 1, 2005, and has had substantial Inuit influence through institutions such as the Labrador Inuit Health Commission for many years before that. Nunavik has had Inuit regional government since the James Bay and Northern Québec Agreement of 1976; while the Government of Nunavut officially came into being on April 1, 1999.

[2] The 33% cut-off also led to the inclusion of one community, Northwest River, NL, from outside of the Inuit land claim areas.

[3] The 1996 Census is the mid-point of the time-period covered in this study.

[4] The 2001 APS sample contained some 10,755 Inuit, of whom 8,943 responded to the survey, for a response rate of 83% (Canada 2003b).

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