Mortality in the Kivalliq Region of Nunavut, 1987-1996

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ABSTRACT

Introduction. The Kivalliq region of Nunavut, Canada, had a 1996 population of 7,131, of which 87% were Inuit. An attempt was made to characterize patterns of mortality in the region. Study Design. Descriptive regional mortality study, based on 10-year retrospective review of health records data. Methods. All deaths and stillbirths of Kivalliq residents during the study period were identified. Available health records data were reviewed for each death, including medical charts, death certificates and coroner’s reports where applicable. Age-standardized mortality rates, both overall and cause-specific, were calculated and compared to both Canadian national rates and territorial rates from the same time period. Results. The infant mortality rate was 32.3/1,000 live births, five times Canada’s rate. Leading causes of infant deaths were prematurity and Sudden Infant Death Syndrome (SIDS). The overall mortality rate was 1.8 times that of Canada, with leading causes of death being cancers (especially lung cancer), circulatory disease, respiratory disease, unintentional injury and suicide. Conclusions. Identified areas of concern included mortality due to premature birth, SIDS, unintentional injuries, suicides, respiratory disease and lung cancer. It is hoped that this study’s results will assist territorial leaders, health workers and citizens in health planning activities.

Keywords: Inuit, epidemiology, mortality

INTRODUCTION

Overall mortality rates in Canada have been on a downward trend for the last 70 years (1), with increased life expectancy being primarily attributed to decreases in infant mortality (2). However, statistics show marked disparities in mortality rates among different regions. The Northwest Territories, which until 1999 included the territory now known as Nunavut, has shown higher overall mortality rates than other regions in the country (3). It is well known that while there have been improvements in health indicators for Canada’s aboriginal peoples, there remain significant inequities in health status when compared to non-aboriginal people (4). A previous study of mortality in the Baffin Region of Nunavut showed a higher proportion of deaths from injuries, cancers and respiratory diseases compared to Canada as a whole (5).

The Kivalliq region, the southernmost of Nunavut’s three administrative regions, had a 1996 census population of 7,131, of whom approximately 87% were self-identified as Inuit (6). During the time period of this study, the region was known as the Keewatin region and was part of a larger jurisdiction called the Northwest Territories. The primary aims of this study were to examine more closely the patterns of mortality in this region, to a) compare overall and cause-specific mortality rates to those of the entire Northwest Territories and Canada during the same time period, and (b) where possible, to review medical records of all the decedents in order to arrive at a more detailed description of
mortality patterns than could be determined from official vital statistics data. While mortality is only one of the several aspects of health status, it is one of the most fundamental. It is hoped that this information will be useful to health professionals, community members, and the Inuit leadership of Nunavut as they plan future health promotion, prevention and treatment strategies.

METHODS

An attempt was made to identify all deaths and stillbirths of residents of the Kivalliq Region during the 10-year period from January 1, 1987 to Dec 31, 1996. The following sources were reviewed to identify these events and gather information about them: a database of deaths kept by the Keewatin Regional Health Board (KRHB); medical charts of the deceased kept on file at all the Health Centres of the Kivalliq Region; logs of deaths kept on file at each of the Health Centres; and coroner’s reports for those deaths ruled coroner’s cases.

If a death certificate was available, either from the decedent’s Medical Chart or from a Coroner’s report, the death certificate data were recorded. ICD-9 codes were assigned for both the death certificate’s underlying cause of death and to the investigator’s determination of cause of death from review of medical charts and Coroner’s reports. If no death certificate was available, demographic information and cause of death were determined from whatever source was available; in most cases, the Health Centre medical chart was used as the main source of information. Further descriptive data regarding individual risk factors and the circumstances of each death were also recorded from all available sources.

Directly age-standardized mortality rates were calculated for overall mortality and selected causes of death, using the total population of Canada in 1991 as the reference population. Population denominators were obtained from sex- and age-specific census population counts for the Kivalliq region, available from Statistics Canada (7). Ten-year age-standardized mortality rates were calculated, along with 95% confidence intervals.

Similarly, age-specific rates for both males and females were calculated. Infant mortality rates and Perinatal Mortality rates were also determined using Statistics Canada birth information for the Kivalliq region for the years under study (8).

Age-standardized mortality rates, both for all causes and cause-specific mortality were obtained for the years under study, for both Canada and the Northwest Territories, from Statistics Canada’s Health Indicators database (9).

Because of the small populations and wide variations in rates from year to year, it was not possible to determine trends in mortality rates during the study period. Similarly, it was not possible to create reliable life tables or estimate life expectancies due to the low number of deaths studied.

Figure 1. Comparison of Average Total and Cause-Specific Mortality Between Canada, Northwest Territories as a Whole, and the Kivalliq Region: 1987-1996. (Error Bars = 95% CI)
RESULTS

316 deaths and 26 stillbirths occurred in the Kivalliq region during the study period 1987-1996. 68 of the deaths were of infants less than one year of age. The overall mortality rate, after age adjustment, was 1.8 times that of Canada as a whole during the study period, and 1.4 times that of the overall rate for the Northwest Territories (see figure 1). The leading causes of death for males and females (see Figure 2) were cancers, heart disease and strokes, respiratory disease, accidents, and suicides. The infant mortality rate (see figure 3) for the study period was 32.3 infant deaths per 1,000 live births, five times the overall Canadian rate of 6.5 per 1,000 live births for the same period. Leading causes of infant deaths were premature births (27%) and Sudden Infant Death Syndrome or SIDS (22%). Other causes of infant death included unknown causes (22%), birth defects (7%) and respiratory infection (7%).

Compared to the other age groups, there were few deaths in the age groups between the ages of one and nineteen years old. For children aged 1-9, the leading causes of death were respiratory
infections, accidents, and birth defects. From the ages of 10-19, the leading causes were suicide (3 deaths) and accidents (2 deaths).

Accidents and suicides together accounted for most of the deaths in the 20-44 age group.

Main causes of accidents in all age groups were boat accidents (21%), drowning (15%), hypothermia or freezing (15%), ATV accidents (12%) and house fires (12%). Cancer took over as the leading cause of death in males and females 45 and older, with second place being taken by lung disease in females and cardiovascular disease (heart disease and strokes) in males. Overall, the main causes of cancer deaths were lung cancer (51%), colon cancer and other cancers of the digestive system (20%) and nasopharyngeal cancer (8%). During the study period, there were two deaths from prostate cancer, two deaths from parotid lymphoepithelioma, one death from breast cancer, and no deaths from cervical cancer. Main causes of cardiovascular deaths were stroke, heart failure and ischemic heart disease. Of respiratory deaths among adults, 83% were due to chronic obstructive lung disease. Only one death occurred that was attributable to diabetes.

Chart review for each death enabled the collection of data regarding presence or absence of known risk factors for cause of death in each case. While a detailed account of those results is beyond the scope of this article, selected findings are outlined in Table I.

### Table I. Frequency of selected risk factors for different causes of death

| Causes of death                          | Risk factors                                                                 |
|-----------------------------------------|-----------------------------------------------------------------------------|
| Premature Birth, N=18 (5 female, 13 male) | Maternal smoking in pregnancy, 91% (10/11). Inadequate prenatal care, 29% (4/14). Twin pregnancy, 11% (2/18) Previous preterm delivery, 17% (3/18). No recorded cases of alcohol or substance abuse. |
| Sudden infant death syndrome, N=15 (9 female, 6 male) | Maternal: smoking in pregnancy, 91% (10/11). Maternal anemia in pregnancy, 50% (5/10). Recorded alcohol or substance abuse in pregnancy, 25% (3/12). Infant: Prematurity < 37 weeks, 13% (2/15). Primarily formula feeding 40%, (6/15). Co-sleeping with parent(s), 33% (4/12). Found in prone position 79% (11/14). |
| Accidents / Unintentional Injury, N=34 (9 female, 25 male) | Alcohol consumed prior to accident, 28% of adult accidental deaths (8/29). |
| Suicide, N=31 (5 female, 26 male)         | Documented psychiatric diagnosis (including alcohol and drug abuse), 27% (8/30). Immediate precipitating events: relationship problems or breakup, 33% (10/30). Recent criminal activity or charges, 17% (5/30). Family problems, 10% (3/30). No obvious precipitating factor, 33% (10/30). |
| Respiratory Disease (in adults), N=23 (13 female, 10 male) | History of ever smoking, 94% (17/18). |
| Cardiovascular Disease N=35 (11 female, 24 male) | Risk factor information not reliably available |
| Lung Cancer, N=32 (denominators only include cases where the information was available) | History of ever smoking, 100% (31/31) |
Death rates for some causes of death were elevated compared to Canada as a whole. These included Sudden Infant Death Syndrome and premature births (both close to nine times the Canadian rate), lung cancer (almost four times the Canadian rate), accidents and adverse effects (almost four times), suicide (3.5 times), and lung disease (2.7 times). The death rate from all cancers was 1.9 times the Canadian rate. Death rates from cardiovascular diseases and birth defects were similar to Canadian rates.

DISCUSSION

Previous descriptions of mortality among Inuit populations have shown a trend towards markedly declining infant mortality and increased life expectancy over the last fifty years or more (10,11), but with persistent excess mortality compared to largely European-descended reference populations (5). Changes in mortality patterns have reflected a transition in the Inuit way of life, with marked declines in infectious disease deaths, but increases in deaths from cancer, respiratory and cardiovascular diseases, unintentional injury and suicide.

This study’s results were in broad agreement with previously published data. However, Infant mortality rates were higher than most other published figures for Canadian Inuit populations (10,11). Particularly striking were the elevated neonatal death rates from premature birth, as post-neonatal deaths have accounted for most excess infant mortality in other studies. The cause for this is not readily apparent, though it should be noted that calculated infant mortality rates may be falsely inflated if official data on number of births are underestimates. Extremely high smoking rates, estimated at 60-70% of adults in the Kivalliq region (12), likely have a major effect on mortality rates from cancer, respiratory and cardiovascular disease, and probably also on infant deaths from prematurity (13) and SIDS (14). A previous study of alcohol use in Canadian Inuit showed lower frequency of alcohol use than the overall Canadian population, but greater amounts of alcohol consumed, on average, when drinking occurred. Binge drinking patterns may contribute to the incidence of unintentional injuries (15,16), as well as to suicides and homicides. Poverty, poor housing conditions and sociocultural stresses should also be considered as possible contributing factors for many causes of death.

Future research could focus on the analysis of the contributing causes of disparities in mortality rates, and evaluate programmes and policies designed to narrow these gaps.

CONCLUSIONS

This study identified excess deaths in a number of disease categories among the primarily Inuit residents of the Kivalliq region of Nunavut. Causes of death with striking elevations in death rate included: in infants, deaths due to premature birth and sudden infant death syndrome (SIDS); in young adults, accidents and suicides; and in older adults, smoking-related lung disease and lung cancer. Worthwhile health initiatives could include efforts to improve maternal and infant health (including ongoing SIDS public education), anti-smoking initiatives, mental health and addictions programming, and water and vehicle safety programmes. Efforts to maintain the currently relatively low rates of heart disease and diabetes could involve promotion of traditional healthy foods and physical activity, and could prevent many avoidable deaths in the future.

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