

Indigenous health in the Arctic: an overview of the circumpolar Inuit population

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Scand J Public Health 2004; 32: 390–395

The health of the Inuit has undergone substantial changes over the past five centuries, as a result of social, cultural, and economic changes brought about by interactions with Europeans. This process was accelerated considerably in the second half of the twentieth century. The incidence of infectious diseases has declined considerably but is still high compared with Western societies. Chronic diseases such as diabetes and cardiovascular disease are on the increase, while accidents, suicides, violence, and substance abuse are of major importance for the pattern of ill health in most Inuit communities. Lifestyle changes, social change, and changes in society and the environment are major determinants of health among the Inuit.

Key words: Arctic, health status, health determinants, Inuit.

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INTRODUCTION

The health of the Inuit and other indigenous peoples of the circumpolar north has undergone substantial changes over the past five centuries, as a result of the changes brought about by interactions with Europeans. This process was accelerated considerably in the second half of the twentieth century, with important consequences for their health (1, 2). This paper provides a brief overview of the health status of the Inuit and some of the factors that have contributed to this pattern.

THE CIRCUMPOLAR INUIT POPULATION

The Inuit homeland stretches from the easternmost tip of Russia in the west to Greenland in the east, and today the Inuit live in four nations. Inuit are descendants of the last of several waves of human migrations across the Beringia landbridge, which occurred some 5,000 years ago (3). Today there are around 167,000 Inuit worldwide, distributed in Greenland (50,000), Denmark (8,000), Alaska (44,000), other parts of the USA (13,000), Canada (50,000), and Russia (1,700) (2). There are two main linguistic branches: the *Inuit/Inupiaq* which extends from northern Alaska, across Canada, to Greenland; and the *Yup'ik* in central and south-western Alaska

and the Chukotka peninsula in Russia. In Canada, Inuit are sometimes grouped with First Nations and Métis people and referred to as *Aboriginal people*. In Alaska, the term *Alaska Native* encompasses Eskimos (a term still widely used and not considered to be pejorative), Aleut, and American Indians. Greenland Inuit refer to themselves as *Kalaallit*. The term *Eskimoski* exists in Russian, and Inuit are a very small minority within a non-Slavic minority collectively known as *malochislennye narody Severa*, or “numerically small peoples of the North” (2). While no one single term covers the Inuit/Inupiaq/Yup'ik/Kalaallit entirely satisfactorily, we use the term “Inuit” collectively, since it is also used in the official name of the multinational Inuit Circumpolar Conference. While the Alaska Natives are a large minority in a state of the USA, most Inuit in Canada live in the Nunavut Territory or in the northern part of Québec Province. The Kalaallit make up most of the population in Greenland, which has an extensive home rule government within the Kingdom of Denmark.

SOURCES OF INFORMATION ON INUIT HEALTH

This review is based on the extensive published literature, much of which is available in electronic bibliographic databases, and statistical reports of

government agencies, increasingly accessible via the Internet. Comprehensive bibliographies on Inuit health can also be consulted (4–5).

The census is the chief source of information (not just for population, but also for key socioeconomic data) for Inuit in Canada (conducted every 5 years), and the USA (conducted once every 10 years). The first census in post-Soviet Russia was completed in 2002, more than a decade after the last one in 1989. The last census in Greenland was held in 1976 but demographic data are continuously updated through the Central Population Registry. The membership lists of Canadian regional Inuit organizations and Alaska Native regional corporations established for land claims registration purposes provide an alternate source of population data.

It is difficult to identify with certainty many health events as occurring among Inuit. Often it is only possible to attribute an event as occurring in a geographical region where the Inuit predominate. The lack of Inuit-specific data is less of a problem in the Nunavut Territory and Nunavik region of Canada, where the majority of population are Inuit (85% in Nunavut and 90% in Nunavik). In Alaska there are six census areas where Eskimos constitute over 90% of the Native population and between 70% and 90% of the total all-race population. In Greenland, residents “born in Greenland” make up approx. 90% of the population; these are commonly used to represent Greenland Inuit.

PATTERNS OF HEALTH AND DISEASE

In the past 50 years the absolute burden of mortality and morbidity has decreased substantially, measurable in terms of life expectancy at birth, infant mortality rate (Fig. 1), and the incidence rate of most infectious diseases. Nevertheless there are still considerable disparities between the health status of the indigenous

populations and the general population of the nation-states with which they are associated. It should also be noted that considerable variation exists across regions and between communities.

The relative contributions of various diseases and health conditions have also changed. The health transition experienced by the Inuit is shared by many other populations undergoing rapid sociocultural change. Its key features are:

- (1) the precipitous decline in infectious diseases (such as tuberculosis), which have stabilized at a level that remains higher than in the general, national population;
- (2) a corresponding increase in the chronic diseases such as heart disease;
- (3) the most important group of health problems, however, is the so-called social pathologies: violence, accidents, suicide, and alcohol and substance abuse.

Infectious diseases

It is unlikely that indigenous people ever lived a disease-free existence prior to the arrival of Europeans, although early observers tend to report a remarkably healthy and vigorous population (6). The small, scattered populations meant that many acute infectious diseases were not able to be sustained, such that by the time European explorers, whalers, traders, missionaries, and settlers arrived, there was very little resistance or immunity in the indigenous population. Diseases such as smallpox, measles, influenza, whooping cough, and intestinal infections attacked the indigenous communities, often with devastating consequences (7).

The rise and fall of tuberculosis (TB) serves as an excellent example of the model of the health transition. During the nineteenth and twentieth centuries, TB was one of the most important diseases and causes of death among the Inuit and other indigenous peoples. It reached crisis proportions during the 1940s and 1950s (8). It also triggered off government response to combat the disease, which included X-ray surveys, evacuation to southern sanatoria, trials of preventive therapy with isoniazid and/or BCG vaccine, and general improvement of health services and community infrastructure (9). These campaigns have been largely successful, although the coercive manner in which they were conducted in some areas has been the subject of much criticism, especially the forced evacuations of patients, which often resulted in years and decades of separation from family and community (10). Different approaches have been used in

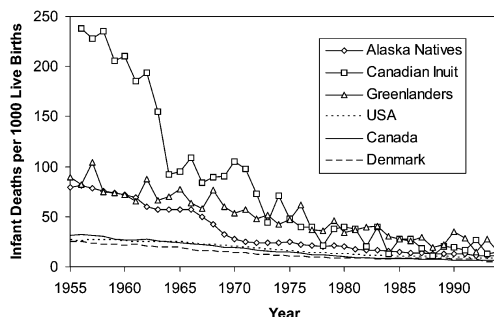


Fig. 1. Trend in infant mortality rate: Greenlanders, Northwest Territories Inuit, and Alaska Natives compared with Denmark, Canada, and USA (adapted from (2)).

Alaska, Canada, and Greenland but the results have been equally successful (Fig. 2).

Today, tuberculosis is largely under control, although sporadic outbreaks still occur from time to time and the rate is still as much as 10 times the national rate. The Inuit are also at elevated risk for other infectious diseases, including pneumonia (11), meningitis (12), hepatitis (13), and sexually transmitted diseases (14).

Some diseases appear to be peculiar to the Arctic ecology and cultural practices of the indigenous populations. For example, botulism, which is caused by ingestion of a toxin produced by *Clostridium botulinum*, which grows in traditionally prepared fermented meats, occurs periodically, sometimes with fatal results (15). There are also parasites such as *Trichinella* which are normally found in animals and can be ingested by humans, especially those who still consume game meats obtained from hunting (16).

Chronic diseases

Chronic diseases are a large group of diseases with multiple risk factors and affecting different body organs, characterized by insidious onset, slow progression, and long duration. They are mainly diseases of older adults, although its early stages may well begin in childhood. Within this group, several diseases such as cancer, ischemic heart disease, stroke, diabetes, obesity, and hypertension have been called "diseases of modernization" or "Western diseases" because they tend to increase in traditional societies (such as circumpolar indigenous peoples) undergoing rapid social changes, with changes in diet, reduction in physical activity, and exposure to new environmental hazards (17).

Cancer has been studied extensively among the Inuit, and there was an international circumpolar study group during the 1980s and 1990s that used standardized data collection and contributed significantly to our understanding of the unique cancer patterns and their likely causes. The overall risk of cancer, when all sites are combined, is not significantly

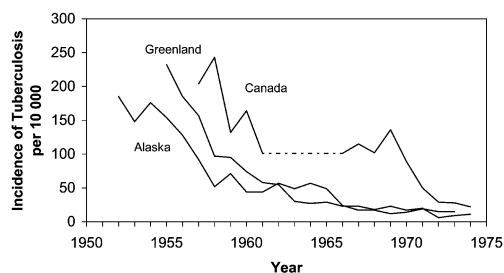


Fig. 2. Decline in the incidence of tuberculosis among Alaska Natives, Canadian Inuit, and Greenlanders (adapted from (2)).

different between Inuit and their national counterparts during the period 1969–88 (18). In terms of specific sites, the Inuit have among the world's highest rates of several cancers that are very rare in most other populations: cancer of the nasopharynx, the salivary glands, and the oesophagus (19). However, these "traditional" cancers have been on the decline, while the "modern" cancers, such as cancer of the lung, breast, colon, and cervix, which are common in most industrialized societies, are on the rise (20).

Diabetes is probably also a new disease among the Inuit. A circumpolar survey in the late 1980s showed substantial variation in the prevalence of diabetes among the various indigenous groups, although all were below the average for the USA, and lower than many North American Indian tribes (21). However, compared with 2–3 decades earlier, glucose tolerance surveys among Alaskan Eskimos have shown an increase in prevalence (22, 23).

Total cardiovascular mortality is higher among the Inuit than in European/North American populations (Fig. 3) (24). Mortality from cerebrovascular disease is higher but some studies of ischemic heart disease among the Inuit have showed a reduced mortality compared with European/North American populations (25, 26). It is, however, possible that this could be the result of diagnostic inaccuracy (24). Autopsy studies have shown comparable levels of atherosclerosis (27). Inuit blood pressures rank intermediate on a global scale but low in comparison with most European populations (28). A study of Greenland Inuit showed higher blood pressure among migrants to Denmark than among those residing in their homeland (29).

Injuries and the social pathologies

Among the most serious health problems affecting circumpolar indigenous peoples in the last half of the twentieth century are injuries. In the younger age groups until around 35 years of age injuries are by far the most important causes of death and overall they

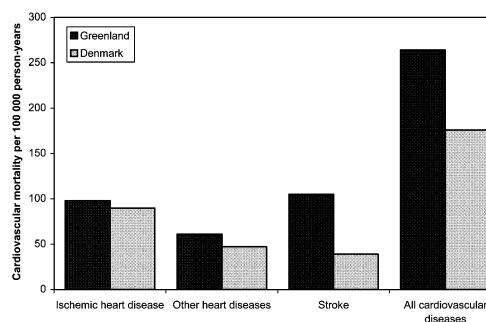


Fig. 3. Age-adjusted cardiovascular mortality 1995–98 among the Inuit in Greenland and the general population of Denmark.

may account for as much as a third of all deaths (30). Injuries can be broadly classified as “intentional” (which may be interpersonal or self-inflicted, and includes assaults and suicide) or “unintentional” (i.e. accidents).

While accidents have always been a hazard of the hostile natural environment experienced by circumpolar peoples, more recent sociocultural changes and the general availability of alcohol have changed the pattern and extent of injuries. Traditionally, Arctic hunters were at risk of hunting accidents (e.g. animal attacks, shooting and boating accidents) and death from exposure or hypothermia. With modernization, motor vehicle accidents and house fires have assumed increasing importance (31). Many accidents are alcohol related, and misuse of alcohol is a major determinant for ill health and social problems in Inuit communities (2).

Interpersonal violence in all its forms (homicides, assaults, abuse), with or without sexual context, directed at strangers or family members, is now an issue of major public health concern in most circumpolar indigenous communities (32). There are different explanations, some focusing on the stress of rapid social change, and the inadequacy of traditional conflict resolution behaviours in the new, more urbanized environments.

While suicides were not common among the Inuit before the 1950s, they were not unknown. Traditionally, suicide was practised mainly by the elderly and the infirm. This pattern is in sharp contrast with the now prevalent pattern of adolescent suicide, which often occurs in clusters (33, 34). This is not peculiar to the Inuit, as a similar development has taken place in many other aboriginal communities in North America and elsewhere. While among the national populations suicide rates tend to increase with age, in indigenous populations the peak rates occur at age 15–24, with males outnumbering females (Fig. 4). For every completed suicide, there are several suicide attempts, and perhaps an even broader pool of

individuals who have entertained suicidal thoughts (35). Many causes or risk factors of suicide have been postulated, and these can be sought at the individual, family, and community levels, from mental illness such as depression to peer pressure to social disintegration resulting from historical injustice (34, 36). Unfortunately there appears to be no simple answer, nor have intervention and prevention programmes that have been attempted been successful in stemming this overwhelming health problem.

DETERMINANTS OF HEALTH

The health transition among the Inuit reflects the interaction of genetic and environmental factors (37). Human biology in the Arctic has been concerned with the genetic contributions to disease and physiological adaptations to the cold climate. Until recently, the Inuit could be considered both geographically and genetically isolated. Their long habitation in the Arctic has also resulted in the evolution of many genetic (and cultural) adaptations, which allowed them to survive and thrive successfully in one of the coldest and most inhospitable environments on earth. Moreover, it is the recent introduction of new stressors and their compression into a short time period that has had the most significant impact on health.

Traditionally, the Inuit appeared to have been protected from atherosclerotic diseases and diabetes, the result of a particular genetic endowment (38, 39) and/or their high dietary intake of marine mammals and fish, and vigorous physical activity (40–42). The apparent “protection” from these diseases is disappearing, primarily because of the rapid change in lifestyles. Existing data are discouraging in that the Inuit have acquired an unfavourable health risk profile compared with other contemporary populations and with Inuit in the past, especially the high prevalence of smoking (43). Traditional food system use is declining rapidly, though not uniformly across the Arctic. In some areas, dietary fat from market foods now exceeds that from traditional, marine-mammal-based sources.

The Arctic is often assumed to be a pristine, unpolluted area. While there are few industries, there are mining activities, especially in Alaska and Canada, which may have a serious effect on the immediate environment. In the Russian Arctic, large-scale industrialization powered by coal has resulted in substantial, often visible, pollution. The invisible contamination of traditional foods with man-made chemicals such as polychlorinated biphenyls (PCBs), dioxins, toxaphenes, and other pesticides, which are transported to the Arctic by ocean and atmospheric currents and then are biomagnified in the marine food web, ultimately end up in humans

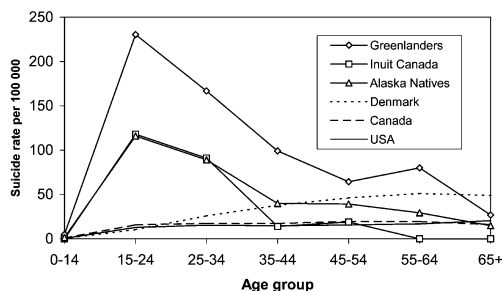


Fig. 4. Age-specific suicide rates 1980–89 in Alaska Natives, Canadian Inuit, and Greenlanders, compared with national populations (adapted from (2)).

(44–46). There is also evidence of exposure to heavy metals such as mercury and lead (47). Of particular concern is the prenatal exposure of infants (48, 49). There may be adverse effects of exposure to organochlorines and mercury on the neuropsychological development of children and of organochlorines on the susceptibility to infections and the immune status.

Many health effects of environmental contaminants are subtle and difficult to detect. Often, benefits and harm need to be carefully considered. The presence of contaminants in the breast milk (50), or traditional marine foods (51), needs to be weighed against the health-promoting and disease-preventing benefits of such diets. It is possible to reduce the intake of contaminants without affecting the intake of nutrients by substituting the most polluted food items with other traditional food items.

“Old” environmental health problems related to housing, water supply, and sanitation have not all been solved (52). Houses in the Arctic are often small and crowded, and in many the indoor climate is damp and heavily polluted with tobacco smoke. Sanitation and waste management are not well developed in the villages. Broader socioeconomic and environmental factors, such as income, education, housing, and employment, affect health status through a variety of pathways. By almost any indicator – educational attainments, individual and family income, housing quality, employment and occupation – and any composite index combining some or all of these, indigenous people fare worse, although improvements have been made.

Arctic indigenous people are undergoing profound social and cultural change. Health becomes affected when there is a discrepancy between modern and traditional values. Traditional cultures coming into contact with a modern cosmopolitan culture may produce acculturation stress. Individuals and communities may develop coping strategies, which build on their cultural repertoire. However, these stresses may be so strong and unfamiliar that the protection provided by traditional culture may be dissipated.

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Accepted 04 06 08