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CANCER IN CIRCUMPOLAR INUIT

Background information for Alaska

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The cancer patterns among Inuit in the Circumpolar area have shown some marked differences from other populations in the world. The current paper summarizes important risk factors in Alaska including the physical environment, diet, alcohol, tobacco; the populations at risk; the health care delivery system; and cancer registration. This information is important for the interpretation of the incidence pattern for the Circumpolar Inuit collectively and for the understanding of differences between the various Inuit populations of the North.

Geography and physical environment

Alaska is the largest, but least populated, state of the United States. Its 586 000 square miles (1 518 000 km^2) comprise one-fifth of the total land mass of the United States. Alaska is bounded on the north by the Arctic Ocean, on the west by the Bering Sea, and on the south and east by Canada. The state, including the Aleutian Island chain, covers an area from 50° to 72° north latitude, and 130° west and 170° east longitude, crossing the international date line. Anchorage is the largest city with 224 000 inhabitants in 1980.

As just 15% of the state is connected by roads, only a few of the 200 Alaska Native communities are on the road system. Great distances separate communities between which air transportation is the main option except for occasional river boat travel in the summer, or snow machine in the winter. Many villagers are as many as 400 miles (640 km) from the nearest regional hospital and even further from a major medical facility. Geography and climate can complicate air travel.

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The climate of Alaska varies greatly and includes four zones - maritime, transitional, continental and arctic. Temperature variations are the greatest in the interior, ranging from +100° in the summer to −70°F in the winter (+50° to −38°C).

Population and human environment

The United States census includes ethnic classifications of Eskimo, Aleut, Indian who collectively are referred to as Alaska Natives. These are descendants of the people who inhabited Alaska prior to Caucasians. The term Eskimo is used in the United States to refer to the people who speak four languages: Central and Siberian Yupik, Sugpiaq (Alutiq) and Inupiaq. Inupiaq is synonymous with Inuit and Inuktitut spoken in Greenland and Canada respectively.

The United States census enumerates the population every ten years. Ethnicity is determined by self-classification. In the 1980 census, Alaska Natives numbered 64 000, of which 55% identified themselves as Eskimo (Inuit). As a result of the Russian involvement in Alaska in the 18th and 19th century, Native persons residing on the Alaska peninsula and North Pacific Rim were called Aleut and many continue to characterize themselves as such, although linguists have determined their language (Sugpiaq/Alutiq) to be an Eskimo language. It is estimated about 3 000 of the 6 000 Aleuts identified in the 1980 census are descendants of Inuit speaking peoples. In addition to the North Pacific Rim, the Eskimo have traditionally occupied the north and west coasts of Alaska.

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Although some census and vital statistics data are available by ethnic group (Indian, Aleut, and Eskimo), most data are available for Alaska Natives as a whole. Therefore, most of the information in this section will relate to all Alaska Natives. Eskimos are the largest group of Alaska Natives, and their demographic characteristics are generally similar to those of the other groups. However, it must be emphasized that even within Alaska there is diversity of culture and lifestyle between the various ethnic/linguistic groups. In addition the populations have undergone varying degrees of transition and change since first contact with Europeans.

The Alaska Native population is young. In the 1980 census, 48% of the Native population was under age 20 and only 6% over the age of 60. The mean age of the population was 22 for Natives, 28 for non-Native Alaskans. Alaska Natives currently comprise 16% of the population of the state of Alaska. Although the birth rate for Natives is high (2.6%) and higher than that of Alaska non-Natives, the proportion of the state's population that is Native continues to decline due to sizeable immigration of people from the contiguous United States (1). The majority of the non-Native population resides in roughly 15 towns and cities in central, southcentral and southeastern Alaska. The Native populations reside in nearly 200 villages of approximately 25 to 1 000 people distributed widely throughout the state. The greatest increase in the population of Natives from 1970 to 1980 was seen in the large cities, such that in 1980 31% of Alaska Natives resided in places defined as urban by the US Bureau of the Census. The major cities are Fairbanks and Anchorage. However, over 50% of Alaska Natives still reside in small communities in which Natives are the majority of the population.

Alaska Native families are large with the average number of children 3.57 compared with 1.75 in US families. For Native adults in the fifth decade of life and older, it is not uncommon to find families of up to ten siblings and ten children. Based on income, 26% of the Native population fall below the income level defined as the poverty level for the United States (2, 3).

Lifestyle and diet

Between 1956 and 1961 dietary surveys were done among residents of eleven Native villages, nine of which were Eskimo (4). The most outstanding feature of these surveys was the wide variation in mean daily intake of major nutrients due to seasonal fluctuations of local and imported food supplies. Mean daily intakes of protein and niacin were high. Seventy-five percent of diets were low in calories, calcium, and ascorbic acid, one-third low in vitamin A and thiamin, and one-quarter low in riboflavin. Local foods supplied over half of the protein in the diet, while imported foods supplied over half of the fats and nearly all of the carbohydrates. Total fat intake of Alaska Natives was similar to that of the US, supplying approximately one-third of the total calories.

In 1987–1988, 24-h food recalls were done over four seasons in rural and urban settings among all Native groups, 52% of whom were Eskimo (5). The proportions of the major dietary components (fat, carbohydrate, protein) from local food sources have not changed greatly for rural Natives since the late 1950s. A greater variety of store-bought items are now available due to improved shipping and food assistance programs. This resulted in increased consumption of calcium and vitamin C rich foods and items containing simple sugars. Coffee and tea were consumed in generous quantities, twice the national average.

The proportion of calories provided by dietary fats in 1987–1988 was 37%, similar to both the US population diet, and the 1956–1961 levels. Total calories equalled or exceeded the average for the US and the percent derived from protein was twice the current US average, but less than the 1956–1961 Alaska survey. Use of fish and sea mammals exceeded that in the rest of the US, while intake of fruits, vegetables and dietary fibre was lower. The primary sources of protein were fish, beef, eggs, commercially cured meats, chicken, caribou, moose, sea mammals and other large and small wild animals and birds. The sources of fat included fish and sea mammals and their oils, as well as store-bought foods such as margarine, butter and partially hydrogenated vegetable shortening. Therefore the proportion of poly- and mono-unsaturated fats consumed was higher for Native people than in the United States. The primary carbohydrate sources were white breads, rice, potatoes and sugar-containing items (soda pop, flavoured drinks, table sugar). No grains are raised by the Alaska Native people. Fruits and vegetables are also not raised locally, and are particularly expensive to buy in the local rural stores. Wild berries, wild greens, and roots are available and utilized to some extent.

Many of the local foods are available only at limited times of the year, necessitating extensive food preservation. Traditional food preservation methods include drying, salting and smoking, either alone or in combination, and to a lesser extent fermenting. According to the 1987–1988 survey, approximately 12% of fish and meat had been dried or smoked. In addition, hot dogs and other commercially cured meats were frequently consumed. Mold formation is known to occur frequently, however, neither aflatoxin nor eleven other mycotoxins were detected in samples of moldy fish (6) from regions of the state and from families at high risk for liver cancer.

A high prevalence of alcohol and tobacco use has been a major problem for many years among Alaska Natives. Alaska's rate of per capita alcohol consumption was already double the national average in the USA in the early 1970's and reached 5.1 gallons (18.5 l) of absolute alcohol per year in 1983 (7, 8).

The prevalence of cigarette use in Alaska Natives exceeds that of the overall US population and approaches 50% of adult men and women (9). Alaska Natives begin smoking cigarette at an earlier age than non-Natives. Finally, high rates of smokeless tobacco use are found among Alaska Native school children with rates of 5% in the early grades and 50% in high school youth.

Health services

The federal government provides publicly funded health care to American Indians and Alaska Natives through the United States Public Health Service's Indian Health Service and its contractors. The Alaska Area Native Health Service and the regional Native health corporations deliver comprehensive care specifically to Alaska Natives. There are eight service units within Alaska, each with its small regional hospital which provides both in and outpatient care. There is one large referral hospital in Anchorage. In the small, rural communities, primary care is provided by community health aides/practitioners (CHA/P). They are residents of the community who undergo a special training program. They provide medical services under standing orders and/or in consultation with physicians at the regional hospitals. All illnesses are treated promptly. Difficult cases are referred to the regional hospital and/or to the tertiary care center in Anchorage. Native health care is supplemented by contracts with private physicians and hospitals throughout the state where Indian Health Service or tribally operated facilities and services are not available.

Sources for data

Data for incident cancer cases among Eskimo are from the Alaska Native Cancer Surveillance System which has been collecting data since 1969. Cancers are identified by review of hospital discharge diagnoses, outpatient records, pathology reports and death certificates. In addition, cases were provided by the Seattle Cancer Surveillance System for Alaska Natives seen and treated in the Seattle hospitals. At a minimum, data were obtained on age, sex, ethnicity, primary cancer site, histology and basis of diagnosis. Patients first identified from death certificates were followed back to locate and review original hospital records and query attending physicians. Only if these procedures were unsuccessful and no additional information was recovered was the case classified as DCO (death certificate only). However, no cases were classified as DCO during the observation period.

Detailed tabular material by 5-year calendar periods 1969–1988 is available upon request. Please contact the Danish Cancer Registry, Danish Cancer Society, Strandboulevarden 49, DK-2100 Copenhagen, Denmark.

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