

Health expectancy in Greenland

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Background: Mortality and disease patterns in Greenland have greatly changed since the 1950s. Infectious diseases have decreased markedly; chronic diseases, suicides and violent deaths have increased. *Methods:* Life tables for the period 1991–95 were used and health status was derived from the 1993/94 Greenland Health Interview Survey. Health expectancy for the Inuit population of Greenland was calculated by an index suggested by Sullivan. *Results:* Greenland Inuit women live longer than men, but the expected lifetime in self-rated good health was shorter for women than for men. Chronic disease rates are high in Greenland, and consequently many healthy life years are lost, especially because of musculoskeletal diseases. Health expectancy decreases with age, but for this Inuit population the proportion of healthy life years increases after the age of 60, especially among men. *Conclusion:* The many healthy life years lost in Greenland according to self-rated poor health and chronic diseases should be a cause for concern in public health planning in Greenland. Special attention should also be paid to future investigations of regional patterns of health in Greenland, since there is great population heterogeneity according to geography and urbanization.

Key words: chronic diseases, Greenland, health expectancy, Inuit, musculoskeletal diseases, self-rated health.

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BACKGROUND AND INTRODUCTION

The demographic and epidemiological transition in Greenland in recent times

Profound changes have taken place in Greenland society since the 1950s. External influences, not least from Denmark, have resulted in changes in patterns of production, material living conditions, lifestyle, social relations and health status. Simultaneously, there has been a short-term but sustained decrease in fertility and a long-term decrease in mortality. Especially for mortality and morbidity, a shift can be detected in the emergence of new causes of death, while others have almost disappeared. There has been a decrease in infections, especially tuberculosis, and an increase in chronic diseases, suicides and homicides. These shifts in the demographic and morbidity profiles are often referred to as the demographic and epidemiological transition (1). The transition in Greenland has taken place at a rapid pace, depending on the rates of changes in migration, fertility and mortality and the distribution of risk factors that has contributed to the morbidity incidence, as well as the health care system's ability to respond to the changing epidemiological profiles.

Greenland has been characterized by large internal

migration since the 1950s. One of the most dramatic societal changes has been the politically controversial concentration of large parts of the population in towns and the closing of numerous settlements and villages brought about by a concentration of public investments in housing, education and health care. The same pattern, with movements from rural areas to cities, is well known from many developing countries. Today, Greenland consists of 17 towns and 59 villages of greatly varying sizes distributed in 18 municipalities. The five biggest towns are Nuuk, Sisimiut, Ilulissat, Maniitsoq and Qaqortoq. All these towns are situated on the West Coast of Greenland, where the majority of the population is living and where most of the economic activity takes place. Twenty-four percent of the Greenland population is living in the capital, Nuuk.

With the public sector as the most important and almost only initiator, the constitutional reform and changing reform politics during the 1950s and 1960s resulted in a powerful increase in the economic activity level. The most important control mechanism has been a very conscious localization of investments (2–4). These have included industrial sites, expansion of the infrastructure, funding of housing and expansion of the hospitals, health care and educational

systems. An intentional consequence has been forced urbanization. While 61% of the population in 1945 lived in villages, only 19% did so in 1996. Urbanization has brought about a general increase in public service level regarding social care, health care and schooling, as well as a more stable supply of commodities and a better infrastructure. In addition, housing standards are much improved, with insulation and better sanitary conditions.

Life expectancy for a newborn child in Greenland has almost doubled since the end of World War II. Despite this, a newborn's life expectancy has been about 10 years lower in Greenland than in Denmark for the last 30 years. Life expectancy in Greenland today is 62.3 years for men and 68.3 for women (5), which is at the same level as in Brazil and Turkey. Previous very high rates of infant mortality decreased dramatically during the 1950s, and in 1960 the rate was approximately 80 deaths per 1,000 live born infants. A constant decrease took place during the 1960s, and in 1986–87 the infant mortality was 24 deaths per 1,000 live births, now at about the same level as in Uruguay and Malaysia. The infant mortality rate in Greenland for the period 1960–89 is equal to that in Denmark for the period 1930–59 (6), which means that Greenland in this area even in recent times lags about 30 years behind Denmark. Infant mortality in Greenland is currently three times as high as in Denmark. The conditions in Nuuk are more acceptable, but the death rate increases with the distance from the capital. The remarkable regional differences in Greenland in infant mortality rates are evidenced by the 14 deaths per 1,000 live births in Nuuk compared with 7 in Denmark; in the northern villages in West Greenland, the infant mortality rate is 40 per 1,000 and in the villages in East Greenland 77 per 1,000 (7).

Age-standardized death rates for the total population for all causes decreased from 2,500 to 600 per 100,000 person-years during the period 1950–70 (8–10). Tuberculosis and infectious diseases almost disappeared as causes of death. Simultaneously, chronic diseases, especially cancer and heart diseases, became more visible. Accidents stayed at a high level and the suicide rate increased a little. After 1970, the total death rate increased slightly, but with a great increase in suicides and a great decrease in mortality caused by acute infectious diseases. Violent death has for years accounted for almost 30% of all causes of death: suicides 16%, accidents 12% and homicides 2–3%. Death rates from cancer have remained stable. The causes of death that can be attributed to socioeconomic factors include acute and chronic infections, accidents, suicides and homicides. They amount to 41% of deaths in Greenland and 71% of all potential

years of life lost in the age interval between 1 and 65 years (11).

It is likely that urbanization indirectly has an important role as a factor behind the destabilization of families. The same goes for trends in alcohol abuse, sexually transmitted diseases, suicides and violence resulting in death. The relatively high infant and child mortality caused by acute infectious diseases is especially a problem in the villages and in East Greenland. This could be taken as an indicator of an unequal distribution of living conditions. Inequalities also exist among social groups in Greenland (6).

Fertility rates, in contrast to death rates, increased more constantly until 1964. This increase may have its background in changes in the age structure. A systematic increase in fertility among young married women can be observed between 1946 and 1965, parallel to a decrease in fertility among older women (35+ years). The crude birth rate was reduced from 50 newborns per 1,000 women in 1950–70 to less than 20 per 1,000 in 1966–72 (6). A large-scale family planning campaign was launched in 1967, resulting in the insertion of 4,500 intra-uterine devices in a population of 9,000 fertile women. Induced abortions increased from 5% to 15% of all pregnancies between 1966 and 1972. In addition, great regional differences in fertility were and still are facts of life, as evidenced by the higher fertility rates in villages than in towns (9). Women from the villages have, during the last 15 years, given birth to about 30% more children per year than women from the towns (5). A stable fertility rate slightly under 20 per 1,000 can be identified from 1972 until 1980, after which there has been a small increase until today. The average age for women giving birth for the first time is 22.8 years in Greenland (5), which is lower than in any other country in the western world and almost 4 years lower than in Denmark.

Trends in crude birth and death rates the last 50 years in Greenland have had an enormous consequence on the natural population growth and age distribution. Around 1960 the growth rate was about 4% per year in the Greenland-born population, as against about 1% per year today (excluding external migration). About 25% of the Greenland population is thus under 15 years of age, and 45% is under 25 years.

Demographic components – migration, fertility and mortality – are greatly influenced by the social and cultural context in which they are created and have considerable consequences for the current health status of the population. Especially in a small, but heterogeneous population like in Greenland, context must be taken into account when research is performed. This aspect seems to be of the utmost

importance for public health studies in Greenland, where the historically close relationship to Denmark, and the presence of many Danes with shorter or longer residence in Greenland, must have had a powerful influence on the process of development. The policy and planning implications of the ongoing epidemiological and demographic transition must be based on an understanding of the exact structures of migration, fertility, mortality and morbidity.

Relevance of the indicator

The purpose of this study was to include, in addition to mortality, long-term illness as well as self-rated health in a composite single index for the Inuit population's health status. Health expectancy is recommended as a generic term for all population indicators that estimate the average time a person can expect to live in various health states (12). The most often used health expectancy measure is the disability-free life expectancy of Sullivan's method (13), which estimates the number of remaining years, at a particular age, that an individual can expect to live in a healthy state. Health expectancies have by now been calculated for almost 40 countries, and policy makers have been taking more interest in these figures. The International Network on Health Expectancy (REVES; Réseau Espérance de Vie en Santé) has, since 1989, brought researchers doing specific country studies together, with the intention of developing international standards and harmonizing calculations and use of health expectancy measures. Experiences from the network and country studies have shown that the Sullivan method can be recommended for its simplicity, relative accuracy and ease of interpretation (14).

However, despite the simplicity of the index, great limitations also exist. Most critical is the use of the index in time series in order to monitor sudden health changes in a population (15, 16). Other summary measures of population health, but then also other data and conceptual requirements, may be more useful for more exact monitoring and for the purpose of assisting public health planning and priority setting (17). However, given the limited data available for Greenland, we do not attempt in the present study to estimate trends over time, but for the first time to contribute simple period health expectancy data for the Inuit population of Greenland.

MATERIAL AND METHODS

The analyses consider only the Inuit population of Greenland (pop. 48,000) and do not include the resident Danish population (pop. 7,000).

Data pertaining to health status used in this study originated from the 1993/94 Greenland Health Interview Survey conducted by the Danish Institute for Clinical Epidemiology in collaboration with the Directorate for Health and Research in Greenland (18–20).

The interview population sample was drawn at random from Statistics Greenland's population register of all persons resident in Greenland. The survey covers all of Greenland and the material has information from all 17 towns and from 21 randomly chosen villages. The sample consisted of 2,425 adults over 18 years of age, and interviews were conducted with 1,728 persons, for a total response rate of 71%. In our study we focused on the health expectancy of the Inuit population. As a proxy for Inuit ethnicity we used place of birth, which is the only way a person's connection with Greenland is noted in the official registers. The study population consisted of 1,524 persons (699M, 825F) who were born and currently living in Greenland. The applied questionnaire was developed by the initiators of the Greenland survey (18) and contains questions from a similar survey in Denmark (21) and two similar surveys in Arctic Canada (22, 23), with the addition of some new questions. Information on mortality was taken from the published life tables for both sexes for the years 1991–95 for the Greenland-born population (5).

Prevalence of chronic diseases, especially musculoskeletal diseases, as well as self-rated health in different sex/age groups, was used to calculate health expectancy. Prevalences were assumed to be constant within each 5-year age group.

Responses about chronic diseases were obtained by asking the question: *Do you suffer from any long-standing illness, longstanding sequelae from injury, disability, or other longstanding complaint?* Longstanding was defined as 6 months or more. Response categories were *yes/no*. An affirmative response prompted a question as to diagnosis. Up to four diseases could be indicated as simultaneously present in each individual. These were afterwards classified by ICD-8 codes. Only musculoskeletal diseases were prevalent enough to be included as a subgroup of chronic diseases in the present analysis.

Responses on self-rated health were obtained by asking the question: *How would you rate your present state of health?* Five response categories were possible: *very good, good, fair, poor* and *very poor*. These categories were aggregated into two: *good* (including *very good* and *good*) and *poor* (including *fair, poor* and *very poor*).

The health expectancy calculations were based on Sullivan's method (13), which involved combining life tables and cross-sectional prevalence rates on health.

The total number of years lived in 5-year age groups was calculated from the life table, and the number of years lived in good health was estimated from the survey responses. The total number of years to be spent in good health from a given age was related to the number of survivors at that age. Finally, to measure the proportion of a lifetime spent in good health, health expectancy was related to life expectancy. Confidence intervals were estimated by the formulas suggested by REVES (14, 24).

RESULTS

Self-rated health

With regard to the question of self-rated health, a total of 19% of men and 25% of women responded that their present general state of health was fair, poor or very poor. The proportion increased with age for both sexes.

Table 1 shows estimates of health expectancy based on answers to the question on self-rated health for the adult Inuit population in all of Greenland according to sex and age. A 20-year-old man, for example, has a life expectancy of 44.3 years, of which 34.9 years will be in good or very good health. That is, 9.4 years will be spent in a fair, poor or very poor state of health – represented by the healthy life years lost. The 34.9 healthy life years amount to 78.8% of the person's remaining expected lifetime of 44.3 years, and

represent the proportion of healthy life years in the table.

Women have longer life expectancies at all ages than men, but women expect to have more healthy years lost than men do. In addition, the ratio between health expectancy and life expectancy is much lower for women than it is for men. A 50-year-old woman can expect to live only half of the rest of her life in self-rated good health.

Chronic diseases

A total of 42.6% men and 35.7% women answered that they suffered from longstanding illness. Table 2 shows estimates of health expectancy according to chronic disease. Many more healthy life years are lost when the calculations are based on longstanding illness than when they are based on self-rated health. Life expectancy for a 20-year-old man is 44.3 years, of which 24.2 years (54.6%) are expected to be spent without longstanding illness. Women aged 20 years can expect to live a further 50.6 years, of which 28.4 years (56.2%) will be spent without longstanding illness, i.e. a loss of 22.2 healthy years. The differences between men and women were not statistically significant.

The most frequent chronic diseases are musculo-skeletal diseases, the prevalence being 20.6% among men and 14.0% among women. Table 3 shows the estimates of health expectancy according to musculo-

Table 1. *Health expectancy for Inuit of Greenland according to self-rated health. 1993/94 Greenland Health Interview Survey. Life table 1991–95*

Age	Life expectancy (years)	Health expectancy		Healthy life years lost		Proportion healthy life	
		Years	(95% CI)	Years	(95% CI)	%	(95% CI)
Men							
20	44.3	34.9	(33.5; 36.3)	9.4	(8.0; 10.8)	78.8	(75.6; 81.9)
25	40.5	31.1	(29.7; 32.6)	9.3	(7.9; 10.7)	76.9	(73.5; 80.4)
30	36.5	27.6	(26.1; 29.0)	8.9	(7.5; 10.4)	75.5	(71.6; 79.3)
35	32.4	23.8	(22.4; 25.3)	8.6	(7.2; 10.0)	73.5	(69.1; 77.9)
40	28.3	20.1	(18.7; 21.5)	8.1	(6.7; 9.5)	71.2	(66.3; 76.2)
45	24.3	16.8	(15.4; 18.1)	7.5	(6.1; 8.9)	69.1	(63.4; 74.7)
50	20.1	13.1	(11.7; 14.4)	7.0	(5.7; 8.4)	65.0	(58.3; 71.7)
55	16.6	10.4	(9.1; 11.7)	6.3	(5.0; 7.5)	62.4	(54.5; 70.2)
60	13.0	8.3	(7.0; 9.5)	4.7	(3.5; 6.0)	63.6	(54.2; 73.1)
65	9.9	7.1	(5.8; 8.3)	2.9	(1.6; 4.1)	71.2	(58.9; 83.5)
Women							
20	50.6	34.2	(32.3; 36.0)	16.5	(14.6; 18.3)	67.5	(63.8; 71.2)
25	46.0	30.0	(28.1; 31.8)	16.0	(14.1; 17.8)	65.2	(61.2; 69.2)
30	41.3	25.9	(24.1; 27.8)	15.4	(13.5; 17.2)	62.8	(58.3; 67.2)
35	36.5	21.6	(19.8; 23.5)	14.9	(13.1; 16.7)	59.2	(54.2; 64.2)
40	32.1	17.9	(16.1; 19.7)	14.2	(12.4; 16.0)	55.8	(50.2; 61.5)
45	27.7	14.7	(13.0; 16.5)	12.9	(11.2; 14.7)	53.3	(46.9; 59.6)
50	23.5	11.9	(10.2; 13.6)	11.6	(9.9; 13.3)	50.6	(43.3; 57.9)
55	19.4	10.1	(8.5; 11.8)	9.2	(7.6; 10.9)	52.3	(43.8; 60.8)
60	15.7	8.4	(6.8; 10.0)	7.3	(5.7; 8.9)	53.5	(43.3; 63.7)
65	12.4	6.8	(5.1; 8.4)	5.7	(4.0; 7.3)	54.5	(41.3; 67.7)

Table II. Health expectancy for Inuit of Greenland according to chronic diseases. 1993/94 Greenland Health Interview Survey. Life table 1991–95

Age	Life expectancy (years)	Health expectancy		Healthy life years lost		Proportion healthy life	
		Years	(95% CI)	Years	(95% CI)	%	(95% CI)
Men							
20	44.3	24.2	(22.5; 25.9)	20.1	(18.5; 21.8)	54.6	(50.8; 58.4)
25	40.5	20.8	(19.2; 22.5)	19.7	(18.0; 21.3)	51.4	(47.3; 55.5)
30	36.5	18.1	(16.5; 19.7)	18.4	(16.8; 20.0)	49.6	(45.1; 54.1)
35	32.4	15.4	(13.8; 17.1)	17.0	(15.4; 18.6)	47.6	(42.6; 52.6)
40	28.3	12.7	(11.1; 14.3)	15.6	(14.0; 17.2)	44.9	(39.3; 50.4)
45	24.3	10.1	(8.6; 11.6)	14.1	(12.6; 15.6)	41.7	(35.5; 48.0)
50	20.1	7.9	(6.5; 9.3)	12.2	(10.8; 13.6)	39.4	(32.4; 46.4)
55	16.6	6.5	(5.2; 7.9)	10.1	(8.8; 11.4)	39.2	(31.1; 47.3)
60	13.0	4.9	(3.6; 6.2)	8.1	(6.8; 9.4)	37.7	(27.9; 47.6)
65	9.9	4.5	(3.1; 5.8)	5.4	(4.1; 6.8)	45.1	(31.4; 58.8)
Women							
20	50.6	28.4	(26.5; 30.4)	22.2	(20.2; 24.1)	56.2	(52.4; 60.0)
25	46.0	24.6	(22.7; 26.5)	21.4	(19.5; 23.3)	53.4	(49.3; 57.6)
30	41.3	21.0	(19.1; 22.9)	20.3	(18.4; 22.2)	50.9	(46.3; 55.4)
35	36.5	17.3	(15.5; 19.2)	19.2	(17.3; 21.0)	47.5	(42.4; 52.6)
40	32.1	14.3	(12.5; 16.1)	17.7	(15.9; 19.6)	44.7	(39.0; 50.4)
45	27.7	11.7	(9.9; 13.4)	16.0	(14.3; 17.8)	42.1	(35.8; 48.5)
50	23.5	9.3	(7.6; 11.0)	14.2	(12.5; 15.9)	39.5	(32.2; 46.7)
55	19.4	7.2	(5.6; 8.8)	12.2	(10.5; 13.8)	37.2	(28.8; 45.6)
60	15.7	6.1	(4.5; 7.6)	9.7	(8.1; 11.3)	38.5	(28.4; 48.7)
65	12.4	4.5	(2.9; 6.2)	7.9	(6.3; 9.5)	36.5	(23.4; 49.6)

Table III. Health expectancy for Inuit of Greenland according to musculoskeletal diseases. 1993/94 Greenland Health Interview Survey. Life table 1991–95

Age	Life expectancy (years)	Health expectancy		Healthy life years lost		Proportion healthy life	
		Years	(95% CI)	Years	(95% CI)	%	(95% CI)
Men							
20	44.3	34.4	(33.0; 35.9)	9.9	(8.4; 11.3)	77.7	(74.5; 80.9)
25	40.5	30.6	(29.2; 32.1)	9.9	(8.4; 11.3)	75.6	(72.1; 79.2)
30	36.5	27.1	(25.6; 28.5)	9.4	(8.0; 10.9)	74.2	(70.2; 78.1)
35	32.4	23.5	(22.1; 25.0)	8.9	(7.5; 10.3)	72.6	(68.2; 77.0)
40	28.3	20.2	(18.8; 21.6)	8.1	(6.7; 9.5)	71.4	(66.5; 76.4)
45	24.3	16.9	(15.5; 18.2)	7.4	(6.0; 8.8)	69.5	(63.9; 75.2)
50	20.1	13.5	(12.2; 14.8)	6.6	(5.3; 7.9)	67.1	(60.5; 73.6)
55	16.6	11.4	(10.2; 12.6)	5.2	(4.0; 6.4)	68.6	(61.3; 75.9)
60	13.0	9.2	(8.1; 10.3)	3.8	(2.7; 4.9)	70.7	(62.0; 79.5)
65	9.9	8.0	(6.9; 9.1)	1.9	(0.9; 3.0)	80.4	(69.5; 91.3)
Women							
20	50.6	40.9	(39.2; 42.6)	9.7	(8.0; 11.4)	80.8	(77.5; 84.1)
25	46.0	36.5	(34.8; 38.2)	9.5	(7.8; 11.2)	79.4	(75.7; 83.0)
30	41.3	32.0	(30.3; 33.7)	9.3	(7.6; 11.0)	77.4	(73.3; 81.5)
35	36.5	27.4	(25.7; 29.1)	9.1	(7.4; 10.8)	75.1	(70.5; 79.7)
40	32.1	23.5	(21.8; 25.2)	8.6	(6.9; 10.2)	73.3	(68.1; 78.5)
45	27.7	19.9	(18.3; 21.5)	7.8	(6.2; 9.4)	71.9	(66.0; 77.8)
50	23.5	16.4	(14.8; 18.0)	7.1	(5.5; 8.8)	69.6	(62.7; 76.5)
55	19.4	13.4	(11.8; 14.9)	6.0	(4.4; 7.6)	69.0	(60.9; 77.1)
60	15.7	10.7	(9.2; 12.2)	5.0	(3.5; 6.5)	68.2	(58.5; 77.9)
65	12.4	8.6	(7.0; 10.2)	3.8	(2.3; 5.4)	69.2	(56.7; 81.7)

skeletal disease. Women 35 years of age can expect to live a further 36.5 years, of which 27.4 years (75.1%) will be spent without a musculoskeletal disease. For

ages below 50 years, women are expected to spend more life years without musculoskeletal diseases than men, but the proportion of expected lifetime without

musculoskeletal diseases does not differ between sexes.

DISCUSSION

Mortality and disease patterns in Greenland have changed greatly since the 1950s. There has been a marked decrease in infectious diseases, especially tuberculosis, and an increase in chronic diseases, suicides and violent deaths. The complexity of changes in Greenlandic society since the 1950s has been characterized by political shifts, economic transformations, urbanization, immigration, technological innovation, educational expansion and changing status for men and women. To varying degrees these socio-cultural changes also hold for the other circumpolar Inuit populations in Canada, Alaska and Russia (20).

Realistic estimates of health status have to be based on the availability of data. The great lack of data on health status of Inuit populations limits the practical implementation of new measurement techniques. Calculations of other new summary measures of population health, such as the health expectancy measure disability-adjusted life expectancy (DALE) and the health gap measure disability-adjusted life years (DALY), as used in the Global Burden of Disease Study in the World Health Organization, would require the collection of other types of information pertaining to health state valuations (25). They are conceptually and technically more complex measures, but they would be attractive new applied research methods in combining mortality and morbidity with the objective of assisting public health planning and policy decision-making in Greenland.

The Sullivan methodology establishes a simple index for health expectancy that combines mortality and morbidity. Applied to the population of Greenland, estimates of health expectancy have here for the first time been reported for an Inuit population.

As in most other countries, Greenland women tend to live longer than men, but according to their self-rated health they lose many more healthy life years than men do. Almost identical proportions of self-rated fair, poor or very poor health have been found in a recent survey among adults in Denmark (21). Comparisons to other indigenous populations are extremely difficult, since there is a lack of available information to calculate health expectancies. However, in one recent study from New Zealand, health expectancy was calculated for the Maori population. It was shown that ethnic differences became more marked when assessed by health expectancy than longevity of life. Health expectancy was calculated for self-rated general health, mobility and handicap. At

age 15, the proportion of expected handicap-free lifetime related to life expectancy was lower for Maori than for non-Maori people and lower for women than for men. For self-rated health, the ratios were the same among Maori men and women, and for mobility a little worse for women than for men (26). Gender differences among the Maori were not as marked as among the Greenland Inuit reported in our study. Greenland women have much lower health expectancy than men according to self-rated health. A study from Australia identified better or similar self-rated health status for the Aboriginal population than for the non-Aboriginal population, although the opposite would have been expected, given that Aboriginal people suffer from a number of health problems at significantly higher rates than the rest of the population (27).

The prevalence of chronic diseases is high in Greenland and many healthy life years are lost. Inuit men have especially high chronic disease prevalences (43%) both compared to Inuit women (36%) and to Danish men (35%) (21). Proportions of healthy life years according to chronic disease are almost identical for Inuit men and women until 60 years of age. The proportion increases for men over 60 years of age. Far greater proportions of healthy life years are lost because of longstanding illness than because of poor self-rated health. One possible explanation for this could be coping, or adaptation to a given health problem and life situation, resulting in a more positive response to the self-rated health question than to the more neutral chronic disease question. This situation also shows that health is more than the mere absence of disease. Given the data availability from the survey and life tables, we could not maintain sufficient statistical power to break down the estimates of health expectancy into smaller and more specific disease groups or according to socio-economic status.

The increase in the proportion of healthy life years in the oldest age groups could have several explanations, besides the obviously greater uncertainty that arises from basing estimates on the fewer people at risk in the older age groups, as indicated by the broader confidence intervals. The Inuit are a proud people with a historic hunting culture where weak people were of little use to society. Perhaps the older people, who used to be hunters themselves, are more reluctant to admit weakness today. Another explanation could be that we see a selected group of elders that lived healthier lives in youth, when they were hunters. They led active outdoor lives, they drank less alcohol and fewer were smokers than in the later cohorts. All in all, these factors could have made for a better health prognosis in later life. Finally,

mortality used to be high; thus, only the healthiest persons have survived to an old age.

It is difficult directly to compare the health expectancy figures for Greenland with other country estimates, since measurement methods and population target groups have not yet been fully harmonized. Efforts to collect and compare health expectancy results from OECD and EU countries have been made in the REVES network (28, 29). Several variants of health expectancy have been estimated in Canada, but not for the Inuit population separately. The proportion of disability-free life expectancy for a Canadian newborn in 1991 was 91.5% for girls and 93.0% for boys and at age 65 years, 76.7% for women and 80.8% for men (30). In comparison, an alternative estimate in Canada for the period 1990–92 gave a very similar proportion of health-adjusted life expectancy at age 65 years: 77.4% for women and 82.1% for men (31). Health expectancy in various forms and for various age groups has also been published for the Scandinavian countries. The most comparable estimates seem to be for the elderly population over 65 years of age. The proportion of life expectancy with very good, good or fair health was almost at the same level in Norway and Denmark. At 65 years of age in Norway (1984), it was 83.5% for women and 86.7% for men (32), and at 66 years of age in Denmark (1987), it was 81.4% for women and 83.0% for men (33). In Finland (1986), the proportion at 65 years of age was 66.7% for women and 71.6% for men (34). Thus, our health expectancy results for Greenland Inuit are lower, indicating the comparatively poorer health status of the population.

One limitation in the health expectancy calculations in this study is the lack of sufficient mortality data to use Sullivan's index at regional levels in Greenland. Data from the 1993/94 Greenland Health Interview Survey indicate that there are great regional differences in self-rated health and in the prevalence of chronic diseases and musculoskeletal diseases. A total of 31% of the population in villages (both sexes) rated their health as poor or very poor, in contrast to 20% in the towns. For chronic diseases, the villages had a 47.8% prevalence rate and the towns a 36.3% rate. Musculoskeletal diseases had a total prevalence rate of 23.6% in the villages, as opposed to 15.4% in the towns. Special concern should be given to future investigations of regional patterns of health in Greenland, since there is great population heterogeneity according to geography and urbanization.

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