

Socioeconomic characteristics and health outcomes in Sami speaking municipalities and a control group in northern Norway

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Objectives. The Sami people constitute an ethnic minority in northern Norway. The objectives of this study were to compare municipalities with a majority of Sami in the population and a control group with regard to socioeconomic factors and health outcome.

Methods. Original data from Statistics Norway and Directorate of health on socioeconomic factors (education, unemployment, disability, poverty) and health outcomes [total mortality, cancer specific mortality, cardiovascular disease (CVD) specific mortality] were imported from the “Health Atlas” at the Northern Norway Regional Health Authority (NNRHA) trust. The 8 municipalities in the administration area of the Sami language law (Sami-majority group – 18,868 inhabitants) was compared with a control group consisting of 11 municipalities where the Sami constitute a small minority in the population (18,931 inhabitants). Most data were from 2005 and 2008.

Results. There was no significant difference in socioeconomic factors. Overall, cancer- and CVD-specific mortality rates were similar in both groups. The life expectancy was significantly longer among women in the Sami-majority area (81.3 vs. 79.5 years, $p=0.035$) and males (74.5 vs. 72.0 years, $p=0.037$).

Conclusion. Socioeconomic factors and cause-specific mortality rate were similar in the Sami-majority group and the control group. Residents of both sexes in Sami-majority areas enjoyed longer life expectancy.

Keywords: *Sami; specialist health care; referral; ethnic minority*

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The Sami people are the indigenous ethnic group of northern Scandinavia and the Kola Peninsula. The Norwegian government has ratified them as the indigenous people in Norway (1). The size of the present Sami population in the Scandinavian countries is not well known. Different estimates suggest the total population to consist about 110,000 people (2). The Norwegian Sami population is the largest, followed by the Swedish, the Finnish and the Russian. The majority of the Sami people in Norway live in the 3 northern counties (Finnmark, Troms and Nordland), and the Sami Parliament is located in Finnmark. The size of the Sami population in Norway has been reckoned to be approximately 75–100,000, but estimates vary in accordance with the criteria employed such as genetic

heritage, mother tongue and sense of belonging to the Sami (3). Although the Sami in Norway are protected by a Sami Act, they have a different indigenous language and culture that may cause threshold, counter, queue and cultural challenges when assessing the public health care (4). Due to this fact, several national reports have put the Sami healthcare into focus (4–6). However, it has been difficult to clarify whether they experience a health status of superior or inferior quality than other people in Norway due to lack of ethnic markers in national population records and censuses.

Socioeconomic factors as level of education, income and disability may influence on life expectancy (7–10). The objectives of this study were to compare the Sami-speaking municipalities and a control group with regard

to: (a) distribution of socioeconomic factors, (b) analyse life expectancy and mortality and (c) explore the major causes of death (cardiovascular disease and cancer).

Materials and methods

The Northern Norway Regional Health Authority (NNRHA) trust introduced in 2011 a regional “Health Atlas” (www.helse-nord.no/helseatlas/category27764.html) showing socioeconomic and health data for all 88 municipalities within northern Norway. The data implemented were socioeconomic and health variables mostly from 2005 to 2008. An overview of variables included in the survey, their sources and time periods are shown in Table I. Although gender-specific data were available on community level with regard to disability, life expectancy, total mortality, cardiovascular disease (CVD)-related mortality and cancer-specific mortality, such data (gender specific) were not available for the other variables.

Although 40 Norwegian municipalities have Sami residents, 8 main municipalities have been included in the administration area of the Sami language law. The latter were selected as the Sami-majority group of municipalities in this study. They had in 2009 a total number of 18,868 inhabitants and are located in the rural inland areas. The coastal municipalities of northern Norway have generally few Sami people and 11 of them were chosen as the control group of municipalities. They had in total 18,931 inhabitants and were selected based on rural location, distance to hospital and a similar population in size, ratio between gender and age as the Sami-speaking municipalities. The difference in share of Sami between the 2 groups has been shown to be substantial by a Gallup poll conducted in October 2000. In this poll people of Finnmark County were asked if they could speak Sami [a frequently employed criterion for Sami (3)]

and 5 municipalities from the Sami-majority group and 8 from our control group were included. Sami speakers constitute 71% in the Sami-majority municipalities, but only 6% in the control group of municipalities. Based on this fact, several studies have employed the administration area of the Sami language law as a marker of a population with a Sami majority (3,11–14).

The locations of all municipalities in both groups are shown in Figure 1. The female/male ratio was 0.94 and 0.95 in the Sami-majority and the control group, respectively. The percentage, aged at least 67 years, was 16.2 and 17.1% and 80 years or more 5.1 and 5.2%, respectively. None of the municipalities had any hospital or hospital unit. The names of the Sami-speaking municipalities were (with their Norwegian names in parentheses): Deatnu (Tana), Unjárga (Nesseby), Porsanger/Porsángu (Porsanki), Kárásjohka (Karasjok), Guovdageaidnu (Kautokeino), Gáivuotna (Kåfjord), Ástávuona (Lavangen) and Divtasvuona (Tysfjord). The municipalities included in the control group were: Lødingen, Bjarkøy, Lebesby, Gamvik, Måsøy, Salangen, Båtsfjord, Berlevåg, Nordkapp, Hasvik and Vardø. Despite that both Vardø and Honningsvåg (in Nordkapp municipality) are registered as Norwegian towns, we argue that the number of inhabitants (about 2000 in each town) and their location support their classification as rural areas.

Statistical analysis and authorization

No individual patient data were analysed. Anonymous and aggregated data for each municipality were imported from the “Health Atlas” to the study database (www.helse-nord.no/helseatlas/category27764.html). As mentioned, the “Health Atlas” had implemented data from Statistics Norway and Directorate of Health. The latter

Table I. The variables implemented in the analysis and their source

Variable	Sub-variable	Time period	Source
Population		2008	Statistics Norway
Education	Primary school only (30–39 years)	2005 & 2008	Directorate of health
	Drop outs from high school	2005 & 2008	Directorate of health
Disability	Aged 18–49 years	2005 & 2008	Directorate of health
	Aged 50–66 years	2005 & 2008	Directorate of health
Unemployed	Aged 16–24 years	2005 & 2008	Directorate of health
	Aged 25–66 years	2005 & 2008	Directorate of health
Poverty	< 50% of median income	2009	Statistics Norway
Health	Life expectancy	1995–2009	Statistics Norway
	Mortality rate (all)	2005 & 2008	Directorate of health
	Mortality rate females (0–74 years)	2005 & 2008	Directorate of health
	Mortality rate males (0–74 years)	2005 & 2008	Directorate of health
	Cancer-specific mortality (0–74 years)	2005 & 2008	Directorate of health
	CVD-specific mortality ^a (0–74 years)	2005 & 2008	Directorate of health

^aCVD = Cardiovascular disease.

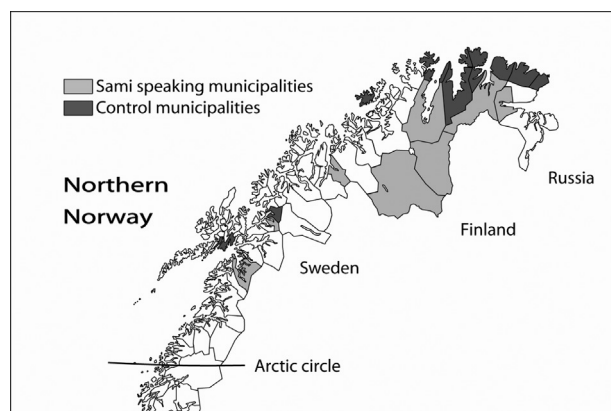


Fig. 1. Map of northern Norway and the Sami- and non-Sami-speaking municipalities.

runs the Norwegian Patient Registry (NPR) data base. The Microsoft Excel 2007 version was employed for the final database, calculations and statistical analysis. Descriptive statistics and the *t*-test were used for the comparison between groups. Significance was set to 5%. The *t*-test was carried out 2-sided. The study was performed as a “quality of care analysis”. We had, as mentioned, no access to any individual patient data and consequently no approval from the Regional Committees for Medical and Health Research Ethics (REK) was necessary. Similarly, no approval from the Norwegian Social Science Data Services (NSD) was requested.

Results

None of the socioeconomic factors analysed (level of education, drop-outs from high-school, unemployment,

disability, poverty) showed any significant differences between the 2 study groups. Looking at gender, the percentage receiving disability pension was lower in the control group (12.8 vs. 10.8%), but the difference did not reach statistical significance ($p = 0.065$). Variations within each group were notable, especially with regard to unemployment and drop out from high school. Details are shown in Table II.

Life expectancy was higher in the Sami-majority group than in the control group, for both women (81.3 vs. 79.5 years, $p = 0.035$) and men (74.5 vs. 72.0 years, $p = 0.037$). Furthermore, the overall ($p = 0.110$), cancer- ($p = 0.335$ and $p = 0.0481$) and CVD-specific mortality rate ($p = 0.213$ and $p = 0.312$) was similar in the 2 groups, respectively. Furthermore, females aged 0–74 years in the Sami-majority group experienced a significantly lower mortality rate ($p = 0.012$). It was notable that the Sami-majority group experienced lower mortality figures in all analyses performed. Details are shown in Table III.

Discussions

In this study we have documented that socioeconomic factors known to influence on life expectancy did not differ between municipalities with a Sami majority population and the control group. The total, cancer- and CVD-specific mortality did not differ between the 2 groups. However, women in the Sami-majority areas aged 0–74 years experienced a significant lower total mortality rate. Furthermore, life expectancy was significantly longer in the Sami-majority group.

Although we showed superior life expectancy in the Sami-majority group, other investigators studying

Table II. How the variables differed between the 2 groups (Sami-majority and control group)

Characteristics	Time period	Sami-majority group	Control group	p-value
Inhabitants	(2008)	18,868	18,931	
Education ^a	2005/2008	25.3% (21.0–29.4%)	26.1% (19.7–36.4%)	$p = 0.829$
Drop outs ^b	2005/2008	27.5% (23–33.3%)	29.1% (16–47.5%)	$p = 0.655$
Disability ^c	2005/2008	49.0 (34–83)	40.5% (35–50)	$p = 0.136$
Disability ^d	2005/2008	315 (223–410)	310 (262–400)	$p = 0.822$
Disability ^e	2005/2008	13.6% (9.8–17.3%)	14.2% (12.3–17.4%)	$p = 0.544$
Disability ^f	2005/2008	12.8% (9.1–17.0%)	10.8% (7.5–12.7%)	$p = 0.065$
Unemployed ^g	2005/2008	6.4% (4.1–7.7%)	6.3% (2.3–10.6)	$p = 0.889$
Unemployed ^h	2005/2008	4.1% (2.9–6.8%)	5.2% (2.3–7.6%)	$p = 0.144$
Poverty ⁱ	2005–2009	4.4% (3.5–6.5%)	5.0% (3.1–7.5%)	$p = 0.265$

^aPrimary school only.

^bDrop outs from high school.

^cAged 16–49 years.

^dAged 50–66 years (numbers/1000 inhabitants).

^eFemales aged 18–66 years.

^fMales aged 18–66 years.

^gUnemployed aged 16–24 years.

^hUnemployed aged 16–66 years.

ⁱLess than 50% of median income in Norway.

Table III. The mortality rates and life expectancy figures in the Sami and the control groups. Mortality rates are annual numbers per 100,000 inhabitants. The figures were adjusted for age and gender differences

Variable	Sami-majority group	Control group	p-value
Life expectancy (F)	81.3 years (79–84 years)	79.5 years (76–81 years)	p = 0.035*
Life expectancy (M)	74.5 years (73–77 years)	72.0 years (67–75 years)	p = 0.037*
Mortality rate ^a	897 (789–1065)	970 (803–1129)	p = 0.110
Mortality rate (F) ^b	255 (232–365)	308 (252–349)	p = 0.012*
Mortality rate (M) ^c	575 (459–666)	610 (437–780)	p = 0.423
CVD-specific mortality rate ^d			
Females	67 (35–106)	90 (68–137)	p = 0.225
Males	222 (170–315)	239 (158–323)	p = 0.491
Cancer-specific mortality rate			
Females	99 (67–172)	129 (80–216)	p = 0.213
Males	150 (81–189)	168 (105–220)	p = 0.312

F = females, M = males.

*p < 0.05.

^aBoth gender and all age groups.

^bFemales (F) aged 0–74 years.

^cMales (M) aged 0–74 years.

^dCVD = cardiovascular disease.

indigenous ethnic groups have observed opposite conclusions. Tjepkema and colleagues (10) employed the 1991–2001 Canadian census mortality follow-up study and compared 16,300 Aboriginal and 2,062,799 non-Aboriginal persons residing an urban area in 1991. The life expectancy at age 25 years was 4.7 and 6.5 years shorter for urban Aboriginal men and women, respectively. Alcohol-related deaths, motor vehicle accidents and infections were the culprits causing shortened life expectancy. Breast cancer-specific mortality rate was, however, lower among Aboriginal women. They suggested socioeconomic factors as community size, lone parenthood, educational attainment, income adequacy, occupation skill level, work status and immigration could explain 63% (for men) and 32% (for women) of the differences in hazard ratio. Similar findings have been observed for Registered Indians residing in Winnipeg, Vancouver and Canada as a whole (15–17). For Status Indians, life expectancy at birth has been reported 8 years less for men and 7 years less for women (18).

Although Canadian Aboriginal people have a shortened life expectancy, this does not seem to be the fact among the Sami today. Per Sjölander (2), published recently, a health-related research on Sami cohorts published in scientific journals and anthologies and concluded similarly as our findings. He compared the health condition among the Sami and the majority non-Sami population. Relevant data from the Sami populations in Swedish were compared with corresponding data from Norwegian and Finnish Sami populations.

The conclusion was that life expectancy and mortality patterns of the Sami are similar to those of the majority population. Furthermore, he reported that Sami lifestyle seems to contain elements that reduce the risk of developing cancer and CVDs, e.g. physical activity, diet rich in antioxidants and unsaturated fatty acids, and a strong cultural identity. The fact that the Sami-majority group in our study showed better absolute figures with regard to cancer and CVD mortality rate could support this statement. In a prior study in cooperation with the Cancer Registry of Norway (CRN) we documented a significantly lower incidence of cancer in the Sami-majority municipalities (3). Especially, breast and lung cancers were less common. This could partly explain the improved total mortality rate among females aged 0–74 years, as breast and lung cancers are common diseases among women aged 50–75 years.

One reason for the superiority of the Sami-majority areas in our study may be due to the fact that the comparator was not Norway in general, but remotely located communities within the same region. The national Norwegian median life expectancy figure (1995–2009) was 77 years among males and 82 years among females, respectively, better than the figures for the Sami-majority areas as found in our study.

Improved socioeconomic status is probably the main cause of good health outcome in the Sami-majority group. Low income seems to be a more powerful risk factor for mortality than low education (2). A recent study (9) comparing Denmark and USA strongly indicated

poverty of even greater importance in Scandinavia than in North America. The poorest 10 percent of the Danish population had a mortality rate ratio of 3.32 (men) and 3.70 (women) compared to the richest 25 percent. The corresponding ratios in USA were 1.67 and 1.56. Similar findings have also been shown among Koreans (8). Focusing Sami and non-Sami it has been shown that the increase in income has been similar in both groups between 1970 and 2000 (2,19). Non-reindeer-herding Sami, both men and women, now appear to have approximately the same level of education as other Swedes in the same geographic setting (2). This is in accordance with our findings of no difference in primary school alone and drop outs from high school between groups. Looking at risk factors potentially affecting life expectancy, the tobacco and alcohol habits appear to be roughly the same among the Sami and non-Sami Swedes (2,19).

We did not analyse other causes of death than cancer and CVD. Other investigators have been concerned about a raised risk of suicide among Sami men (2,20,21).

Reindeer herding is an important cultural activity among the Sami and is associated with high risks for accidents. This was also commented as a significant factor among Aboriginals in Canada (10). We had no access to data on accidents or suicide in the 2 study groups. As new upcoming registries may offer data on vehicle accidents, this should be further elucidated.

Conclusion

Socioeconomic factors and mortality rate were similar in both groups. Except for lower total mortality among females aged 0–74 years in the Sami-majority group, there were no significant differences in total, cancer- and cardiovascular-specific mortality rate.

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