



DiVA – Digitala Vetenskapliga Arkivet <http://umu.diva-portal.org>

This is an article published in **International Journal of Circumpolar Health**.

Citation for the published paper:

Peter Sköld & Per Axelsson

The northern population development: colonization, and mortality in Swedish Sápmi 1786-1895

International Journal of Circumpolar Health, 2008, 67, 1: 29-44

ORIGINAL ARTICLE

THE NORTHERN DEMOGRAPHIC TRANSITION; COLONIZATION, POPULATION DEVELOPMENT AND MORTALITY IN SWEDISH SÁPMI, 1776–1895

Peter Sköld, Per Axelsson

Centre for Sami Research (CeSam), Umeå University, Umeå, Sweden

Received 11 September 2007; Accepted 12 November 2007

ABSTRACT

Objectives. The aim of the Consequence of Colonization project is to study population development and mortality in Swedish Sápmi. This article, the first to be drawn from our research, compares these changes between Sami and non-Sami, South and North Sami.

Study design. Longitudinal individual based data from computerized records of the Gällivare, Undersåker and Frostviken parishes, divided into 2 40-year periods: 1776–1815 and 1856–1895.

Methods. The main source material used for the present study was a set of data files from the Demographic Data Base (DDB) at Umeå University, the largest historical database in Europe. A Sami cohort was created by indicators of ethnicity in the parish registers, and was later extended with automatic linkages to children and parents.

Results. Sami mortality rates show great fluctuations during the period 1776–1815, almost always peaking at a higher rate than in the rest of Sweden. The non-Sami group had lower mortality rates compared with both Sweden as a whole and the Sami in the parish. Between 1856 and 1895, the non-Sami experienced a very small reduction in their mortality rates and the Sami experienced overall improvement in their health status. Significant differences in age-specific mortality appear when the South and North Sami are compared, showing that the South Sami had far lower child mortality rates.

Conclusions. The Sami population's health status improved during the nineteenth century. This indicates that they had advanced in the epidemiologic transition model. A corresponding change is not found for the non-Sami group. (*Int J Circumpolar Health* 2008; 67(1):xxx-xxx)

Keywords: Sami, mortality, demography, epidemiologic transition, colonization

INTRODUCTION

We know that the Sami in present-day Sweden have equally good health when compared with the majority population (1). We also know that this was not the case 200 years ago. The problem is that we know very little about the period in between. Our study focuses on the population development and mortality patterns from 1776–1895 in a remote area of northern Sweden, occupied by indigenous groups and colonizers.

In 1749, Sweden established a system of national aggregated population statistics (2). It was soon revealed that very few people lived in Lapland. The population density was only 2.5 per square Swedish mile (1 Swedish mile=10 kilometres). The national average population density was over 345. Great expectations predominated when scientists estimated the potential to accommodate a much larger population in Lapland (3).

Johansson intended to investigate Sami population trends using official Swedish statistics. He concluded that this was difficult, if not impossible. What he could roughly see in his study was a slow increase in the population beginning in the eighteenth century; nevertheless, it was so modest that the Sami proportion of the Swedish population decreased. He also noticed a great increase in the Sami population after 1900, although the proportion that herded reindeer had decreased (4). Thomasson found similar difficulties in estimating population trends in the South Sami area. He argued that the Sami people were under-registered; nevertheless, a small increase in the Sami population could be found. These fluctuations were mainly a result of migration patterns (5).

Omran's classical essay on the epidemiological transition described how societies over time experience 3 different stages of development regarding their pattern of health and disease (6). The model describes the change from high mortality caused by infectious diseases to low mortality caused by chronic diseases. Omran focused on mortality, but the general scheme also described its relation to demographic, sociologic and economic changes. Different countries could experience the stages at different times. Some of Omran's arguments were based on Swedish statistical material and portrayed Sweden as one of the Western societies that was far advanced and had completed the transition. In Omran's classic work, countries in Latin America, Africa and Asia were described as delayed and had not reached the third stage (6).

Omran opened up discursive space for scientists to develop submodels, and the theory has had great influence on the public health community as well as stimulating research in a variety of disciplines (7). Native people were not mentioned in Omran's work, but the disadvantaged health situation of indigenous populations around the world has become a more popular topic in recent research that focuses on demographic and health transitions among indigenous societies. Life expectancy in the indigenous communities does not match the level of the non-indigenous. Demographic transitions occurred much later. The indigenous communities are often referred to as the fourth world (8–16).

The health disadvantages of contemporary indigenous peoples are profoundly connected to their history of colonization.

Colonization is an experience shared by all indigenous peoples throughout the world. The time, extent, impact and understanding of colonization vary across continents and cultures. Nevertheless, it is a fact that colonization always brings change to indigenous cultures: sometimes positive changes, but more often negative ones (17). Research has shown that the perspectives of immunization, epidemiology, contextualization and cultural characteristics are all important for the interpretation of colonization (12,18–20).

The fact that 2 groups with distinct cultural differences came to live in the same area gives us a unique opportunity to examine these diversities in a historical demographic analysis. They shared the same geographical location and climate, but had different life-styles. Their conceptions of disease and death differed: one group was nomadic, while the other settled; their food cultures were different, as were their family strategies. The Swedish settlers had more contact with the medical system and medical knowledge, while the Sami continued to rely on traditional knowledge and healing.

At the same time, the Sami culture was, and still is, very complex. Sami in the north and in the south had clear cultural differences, nomadic Sami were different from hunting and fishing Sami in the forest regions, and numerous Sami left – or were forced to leave – reindeer herding for a more agricultural way of living. Moreover, a large proportion of the settlers were, in fact, Sami.

The aim of the present study was to use the digitized parish registers to provide the most adequate information about the population in the region in order to improve our understanding of the population's develop-

ment and mortality rates during colonization. A long-term demographic change is problematized when categories such as Sami and non-Sami, North and South Sami, men and women and age-specific distribution are included in the analysis.

MATERIAL AND METHODS

Sweden has excellent resources for conducting population research. Beginning in the seventeenth century, the clergy kept annual records, which included all persons living in the country. Population data are divided into approximately 2,500 parishes and contain an extraordinary amount of information related to individuals. Thus, the material consists of catechetical registers containing annual notifications on who was present in the parish, together with information on specific family composition, as well as books recording births, deaths, marriages and migration.

The main source material used for the present study is a set of data files from the Demographic Data Base (DDB) at Umeå University, the largest historical database in Europe.

In the autumn of 2001, the DDB started digitizing the eighteenth- and nineteenth-century parish records from the northern parts of Sweden – Sápmi – where the Sami people have traditionally lived. The Sápmi Population Database covers approximately 150 years, 1750–1900, and the records include every individual in the parishes. This is also the period in which the area was colonized, largely by Swedish settlers, and when the Sami population changed from a majority to a minority position. The longitudinal data-

base is the first of its kind in the world, based on an indigenous population. The source material separates the Sami and the settler populations and contains information on, for instance, gender, age, cause of death, migration and fertility. Each individual can be followed from the cradle to the grave.

We had to deal with the fact that the information in the Sápmi Population Data Base relies on how the clergy understood, interpreted and classified their society, but also on how the individuals responded to parish registration. The data are not based on self-identification. Nevertheless, the digitized parish records allow us to follow the life course of each individual in the northern Swedish inlands, both the colonized and the colonizers. In the parish records, the clergy began reporting ethnic markers as early as 1750, leaving us today with a very unique and important source with which we can identify the Sami population.

Unfortunately, the Sami society left no written material to posterity prior to the twentieth century. As Sköld's study showed, it is of the utmost importance that we do not solely rely on quantitative sources. There is a need to add relevant qualitative sources that shed light on the complex Sami society and culture. There are great differences within Sami society today in terms of occupation, language, cultural diversity and traditional economies, all of which have a historical background and need to be taken into account in upcoming studies (19–22).

The present study includes the northern parish of Gällivare and the southern non-territorial Sami parishes of Undersåker and Frostviken. This delimitation does not allow valid generalization of the whole of

Sápmi. Nevertheless, the study elucidates the complexity of the traditional Sami area in terms of geographical and cultural differences. It should be clearly stated that the sources for these parishes are not perfect. Up to 1776, the parish registers for Gällivare are not totally reliable because all persons are not noted and the information on mortality is inadequate. Moreover, the period 1819–1847 seems to be problematic due to insufficient population registration in the catechetical records and a missing mortality book for the period 1835–1845 (23). We have satisfactory data for the period 1776–1818, as well as for the period after 1847. Consequently, the data for the period between 1819 and 1847 have been censured in the investigation.

The first Sami parish (lappförsamling) in the South Sami area was Föllinge, established in 1746. Initially, it covered the entire Sami population in the counties of Jämtland and Härjedalen. The unique feature of a Sami parish was that it included only the indigenous population and its territorial borders were not fixed, while the settled Swedish population had territorial parishes and registers of their own (24). The purpose was to keep the indigenous population under specific observation, in order to Christianize and “civilize” it. Administration proved to be too complicated, which resulted in a division of the parish, creating new Sami parishes in the area. The parish of Undersåker broke away from Föllinge by the 1750s, but there are no catechetical records until 1821. Frostviken appears as a new Sami parish in 1842, with complete records from the start. Undersåker and Frostviken are the objects of this study, while other parishes in the South Sami area will be investigated in forth-

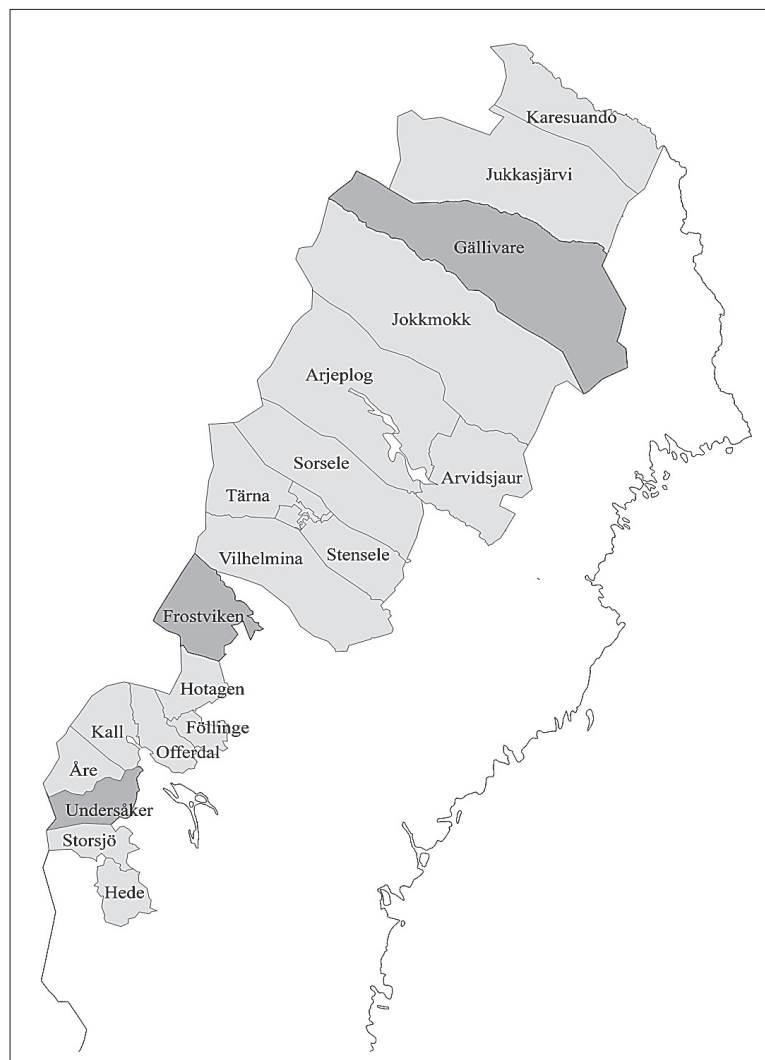


Figure 1. Parishes in Swedish Sápmi. Source: Demographic Data Base.

coming studies. Population growth in northern Sweden was exceptionally high during the last decade of the nineteenth century. The digitization of data ends at the beginning of the twentieth century, and because we wanted to use high quality data, we ended our study with the year 1895. In conclusion, even if the parish registers are complicated by administrative changes and gaps in information, the statis-

tical material provides an excellent opportunity for demographic studies of the Sami and the settled population in Sápmi.

How can we, today, determine an individual's Sami identity in the past? The Swedish parish records are known for their wealth of information, and there are several ways of establishing indigenous identity. The church books do not provide systematic information on ethnicity.

Nevertheless, there are good opportunities for ethnic reconstruction. Most often the terms “Lapp” or “Lappish” are found in the field of occupation, but also in the column where the priest could note information about the person, such as economic, social, legal or moral characteristics as well as in the mortality records. Inclusion of the word “Lapp” or “Lappish” is the most prominent indicator of Sami ethnicity in the sources. As a consequence, not only are nomadic Sami included in this ethnic category but so are those Sami transitioning towards a more settled life-style. In future studies, it will be of great interest to focus on the Sami who became settlers.

Geographical information is also available, and the Sami population often lived in places that were restricted to them, which gives us an additional way of identifying Sami ethnicity in the database material. Moreover, family names reveal heritage. There are certain Sami family names entered in the registers that can be traced over many generations. They have been included as indicators of Sami ethnicity in the investigation. To conclude, precise information is extracted from several variables that provide ethnic information. In an effort to achieve more complete coverage, a computerized linkage was added to indicate Sami ethnicity based on family relations. If a person has a parent or a sibling with Sami status in the database, he/she is automatically given the same ethnic classification. The problem with ethnic status does not exist in the non-territorial parishes in the South Sami area, where Sami parish registers excluded all non-Sami persons. A counterpart to the Sami in our investigation is the “non-Sami” group. It was dominated by Swedish settlers, miners and other workers who entered the Gällivare area mainly during

the last decades of the nineteenth century. The non-Sami group, however, also included families with Finish or even Russian origin. We have no evidence to suggest that there are any Sami persons left in this group. Naturally, there is a theoretical risk of including Sami in the non-Sami group, but our standpoint is that the non-Sami group excluded the Sami, with the possible exception of Sami families that became settled at a very early stage.

Ethical issues

The databases of the DDB are registered and maintained according to the Swedish Law of Personal Integrity (PUL); in order to access information on a person, this law states that he/she must have been dead for 70 years. Identifiable individual information from the last 100 years is not digitized in the DDB. In this project, sensitive data on any individual will nevertheless be protected by not naming the person, as this could harm any relatives living today.

RESULTS

Population development in Sápmi

The Sápmi region experienced great population changes during the nineteenth century. This development was, in fact, the actual colonization of the area. Although the Swedish government’s interest in the northern parts of the country began in the sixteenth century, the great in-migration of Swedish settlers took place 200 years later. Previous research has not paid a great deal of attention to the demographic transition in the area and has often neglected or simplified the ethnic differences.

Our study is limited to 1 northern Sami parish (Gällivare) and 2 parishes in the South

Sami area (Undersåker and Frostviken). This sample does not allow us to make broad generalizations about the whole of Sápmi, especially because we expect to see great differences between parishes. The first settlements in Gällivare appeared as early as the 1660s, but they were not many. The Settlement Act of 1749 was aimed at encouraging more people to migrate into Sápmi. Nevertheless, it was the mining industry in the area that led to an increase in settlements at the beginning of the nineteenth century. Some of the settlements were made up of forest Sami families that had changed their ways of living, and new settlements appeared when the children of Swedish farmers started forming their own families (25). Of great importance was the state initiative for the partition of real estate

(avvittringen), which aimed at sorting property into Crown lands and private real estate. The process was complicated by the fact that the area suitable for farming was also the area the Sami needed for tending their reindeer during autumn and winter. This led to conflicts about land, and the northern regional government was rather weak in its support of the Sami (26).

According to our data, the Sami were in the majority in Gällivare until 1876. During the eighteenth century, they were three times as many as the non-Sami group in the vast and densely populated area. This difference slowly decreased over time, and from the 1850s onwards, the non-Sami population increased more rapidly than did the Sami. Starting in 1876, the settled group was the largest, and

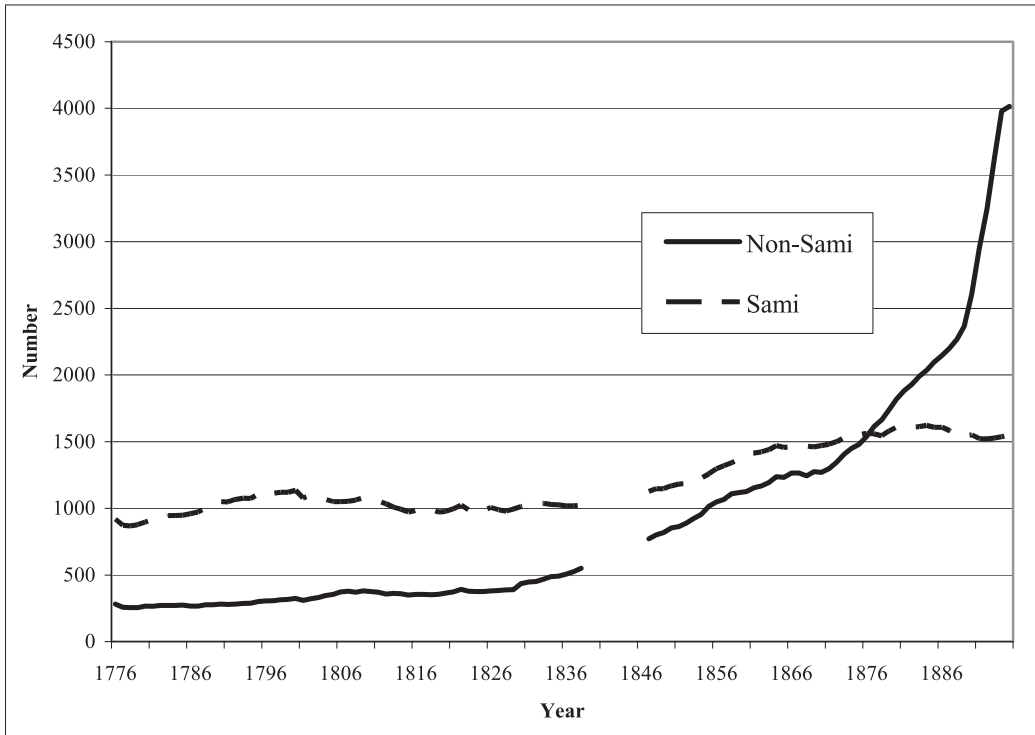


Figure 2. Population trends in Gällivare, 1776–1895. Source: Demographic Data Base, Gällivare parish.

within 20 years their population would be almost three times that of the Sami.

We studied 2 parishes in the South Sami area, which allows us to make a unique comparison between 2 distinctively different Sami areas. We do not want to suggest, however, that the result is valid for the entire South Sami area. It is evident that the population in the South Sami parishes slowly increased during our period of study. Undersåker showed an increase of 50 individuals between 1821 and 1895. During the first 5 years, Frostviken increased steadily, but this likely depended on problems with the first years of registration. In terms of population growth, there was a striking difference between the Sami and the non-Sami group. Over the period 1776–1895, the Sami population in Gällivare increased by 69%, while the corresponding rate

for the non-Sami was 1,324%. This is mainly explained by the limited extent of settlement that took place during the eighteenth century, together with the enormous population increase among the settlers. The general population growth in Sweden during the same period was 141%, which was slightly more than a tenth of the growth in the non-Sami group in Gällivare.

The period from the 1850s onwards was very dynamic in terms of population growth among the non-Sami. Forest and mining industries expanded, and soon it was not only farmers who came to the area. The non-Sami group in Gällivare grew by 283% during the period 1856–1895, while the Sami population only increased by 19.8%. The general growth trend in Sweden during these years was 33.9%. This tells us that the Sami group in Gällivare

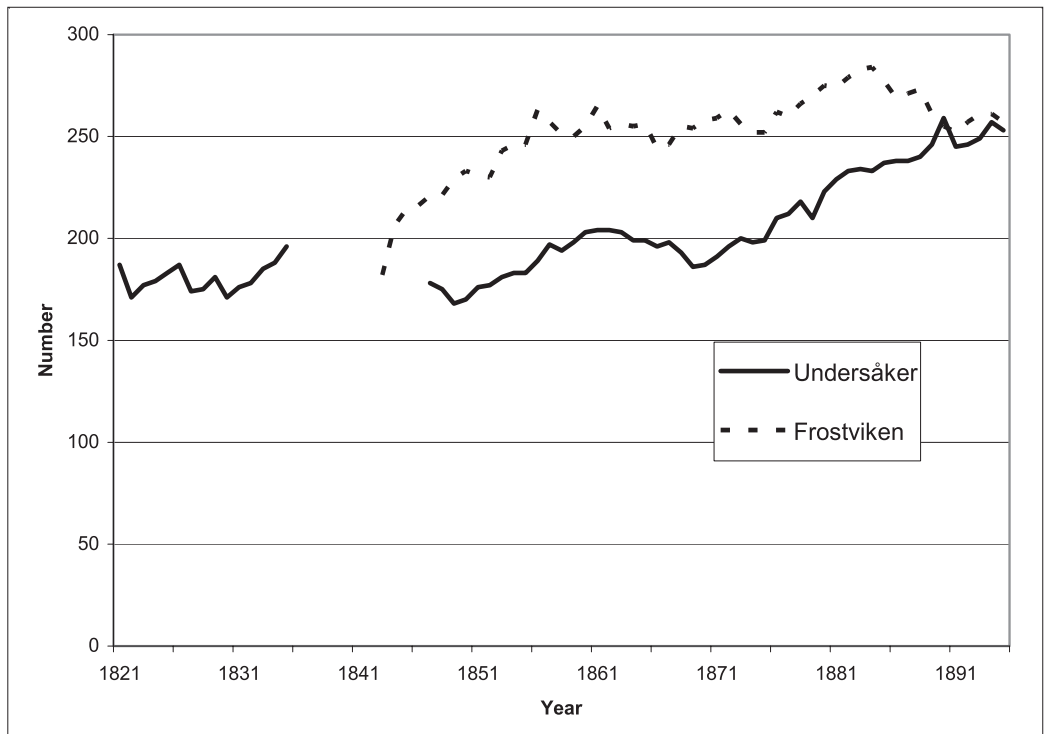


Figure 3. Population trends in Undersåker and Frostviken, 1821–1895. Source: Demographic Data Base, Undersåker and Frostviken parishes.

certainly experienced a modest population growth, but we must consider how much of this can be explained by out-migration from the parish. We know that Sami families that had lost many reindeer were often forced to leave their traditional area and move to the coast of Norway or the Swedish countryside. It is interesting to note that the South Sami villages differ from the Gällivare Sami, as there was a growth rate of 36% in Undersåker but a negative trend with a loss of 2.3% of the population in Frostviken between 1856 and 1895. This indicates the complexity of the demographic transition in Sápmi, predominantly due to colonization. Because of its migration and registration patterns, the South Sami area needs a more complete analysis before a consistent conclusion can be derived.

Figure 4 illustrates the male and female population growth over time. Based on the data, it can be concluded that the population in Gällivare parish overshadowed the South Sami parishes, and the non-Sami group consisted only of individuals from Gällivare. However, it is interesting to note that there were a constantly higher proportion of females than males in the Sami group. In the non-Sami group, there was a small surplus of women until the 1820s, after which time there was a surplus of men. The Sami proportion between men and women was similar to the general trend in Sweden (a female surplus of roughly 10%), while the equal sex proportion among the non-Sami can be explained by the recent in-migration of adults, predominantly men.

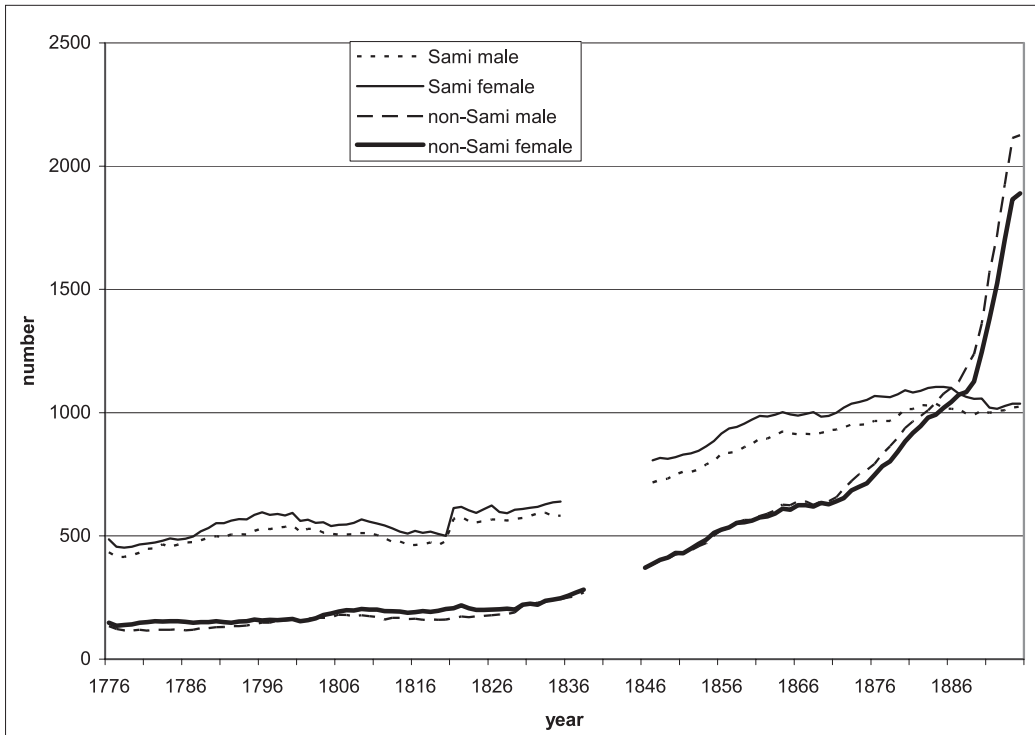


Figure 4. Total population in Gällivare, Undersåker and Frostviken, by ethnicity and sex, 1776–1895. Source: Demographic Data Base, Gällivare, Undersåker and Frostviken parishes.

Mortality patterns in Sápmi

International research shows that, today, most indigenous societies have excessive mortality rates compared with the majority populations (8–16). We also know that the health status of the Swedish Sami population is different, as their current mortality rate is equal to that of the rest of Sweden (1). In most countries, there are great problems involved in studying indigenous peoples' mortality rates from a long-term historical perspective. The main reason is a lack of statistical sources, but this is fortunately not the case in Sweden.

Figure 5 shows that the general trend in the parishes being studied was a higher Sami mortality rate compared with the non-Sami group. Between 1776 and 1817, the Sami mortality rate was high compared with not

only the rest of Sweden but also with the non-Sami, in the Gällivare parish in particular, while the non-Sami experienced long periods of mortality rates considerably lower than the Swedish average.

During the second half of the nineteenth century, Sami mortality rates generally decreased in accordance with the epidemiologic transition. Although their mortality was still higher than the Swedish, the difference had become much smaller. The non-Sami group in Gällivare had lower mortality rates than did the rest of Sweden during the last quarter of the eighteenth century. Notably, the non-Sami did not experience a corresponding decrease in mortality rates during the subsequent century. They gradually lost their health advantage over the general population

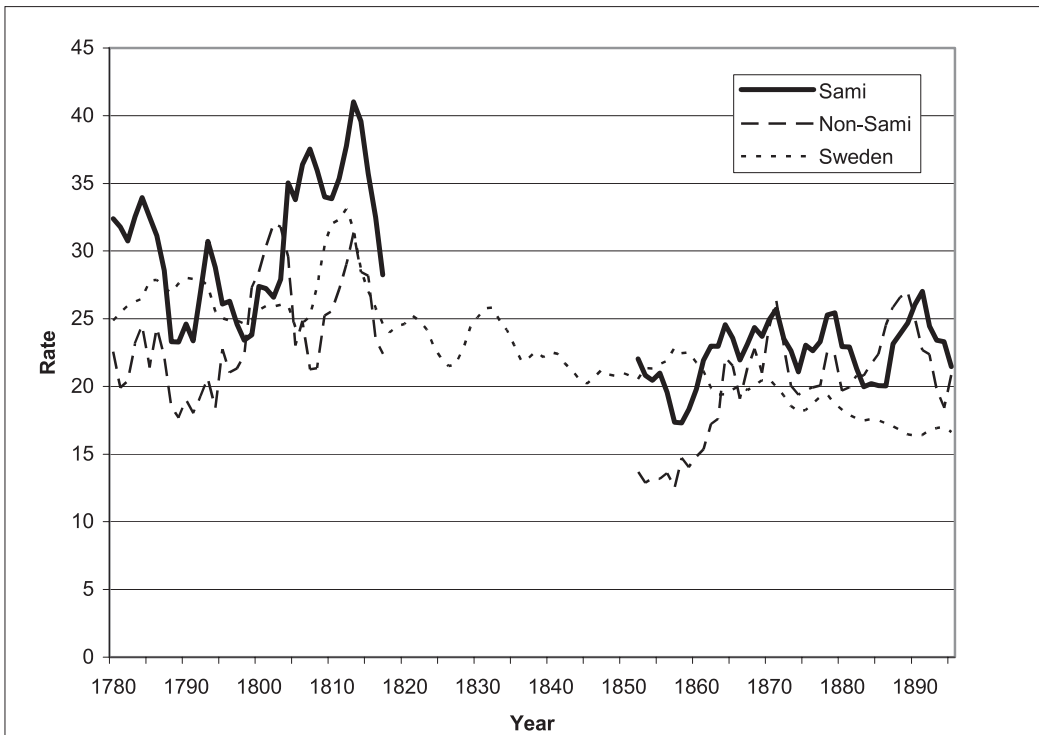


Figure 5. Crude mortality rate (CMR), 5-year moving average by ethnicity, 1776–1895. Source: Demographic Data Base, Gällivare, Frostviken and Undersåker parishes.

in Sweden, and after 1876 the mortality rates for both the Sami and the non-Sami groups reached peaks that were not present for the rest of the nation.

The Sami men had higher mortality rates than did the women until the 1880s. The difference was stable between 1776 and the 1850s. The effect of the sex-related differences is illustrated in the population profile, where there was a surplus of women during the same time period. Even if migration had an impact, mortality certainly did too. During the last 2 decades of the investigated period, the number of Sami men equalled the number of Sami women. The change was caused by the faster decrease in male mortality.

During the period 1856–1895, differences within the Sami area can be studied. It

is obvious that the northern part experienced higher mortality, even if the South Sami experienced higher rates during shorter intervals. The difference may be partly explained from a regional perspective. The county in which the South Sami lived was Jämtland, a region characterized by its low mortality, especially concerning infants and children (28). The northern county, on the other hand, was known for its generally high mortality rates. This is strengthened by the fact that the non-Sami group, too, had comparatively high mortality.

Age-specific mortality during the period 1776–1815 reveals generally higher rates for the Sami in Gällivare. The only exceptions were the 10–19 age group and people older than 80, where the Sami had a small advantage. The oldest age group has been excluded from Figure

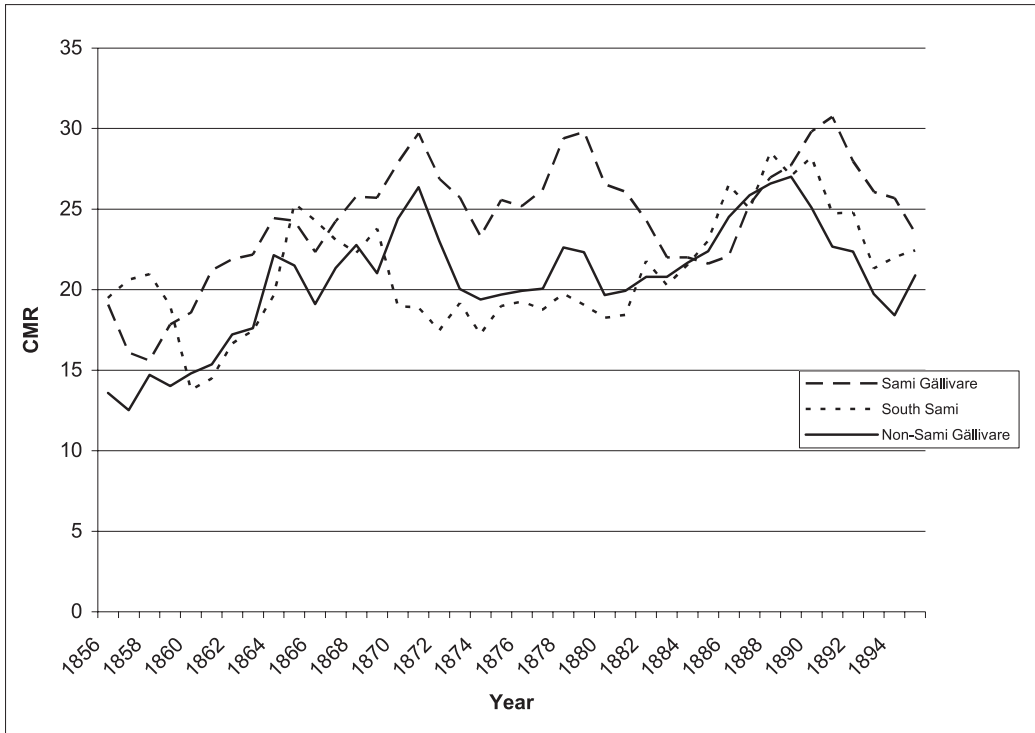


Figure 6. Crude mortality rate (CMR), Sami in Gällivare, South Sami area (Undersåker and Frostviken) and non-Sami in Gällivare, 1856–1895. Source: Demographic Data Base, Gällivare, Undersåker and Frostviken parishes.

7, owing to its extremely high mortality rate. The largest difference was within the youngest age group, 0–9 years. The Sami children had more than a 50% higher mortality rate than the non-Sami in the area.

During the period 1856–1895, the non-Sami 0–9 age group in Gällivare had higher mortality rates than during the 40-year period between 1776 and 1815. The difference between the non-Sami and Sami children in the parish had decreased from 50% to 10%. It is remarkable to note that South Sami child mortality was less than half the rate of Gällivare Sami in the 0-9 age group in the north. The non-Sami group had the lowest mortality in all age groups between 10 and 69 years, while the Sami in the northern and the southern areas reached similar levels.

Concerning the old people, the South Sami had the highest mortality rates for the age groups 70–79 and 80+. Age-specific mortality for the Sami 70–79 age group in Gällivare was considerably lower than that of the non-Sami and South Sami.

DISCUSSION

It is widely acknowledged that indigenous peoples around the world exhibit demographic regimes that are quite distinct from those observed in the majority population (29–32). Therefore, the question of an indigenous health transition is often discussed but, due to a lack of data, rarely examined. The present study provides a unique attempt to examine the early

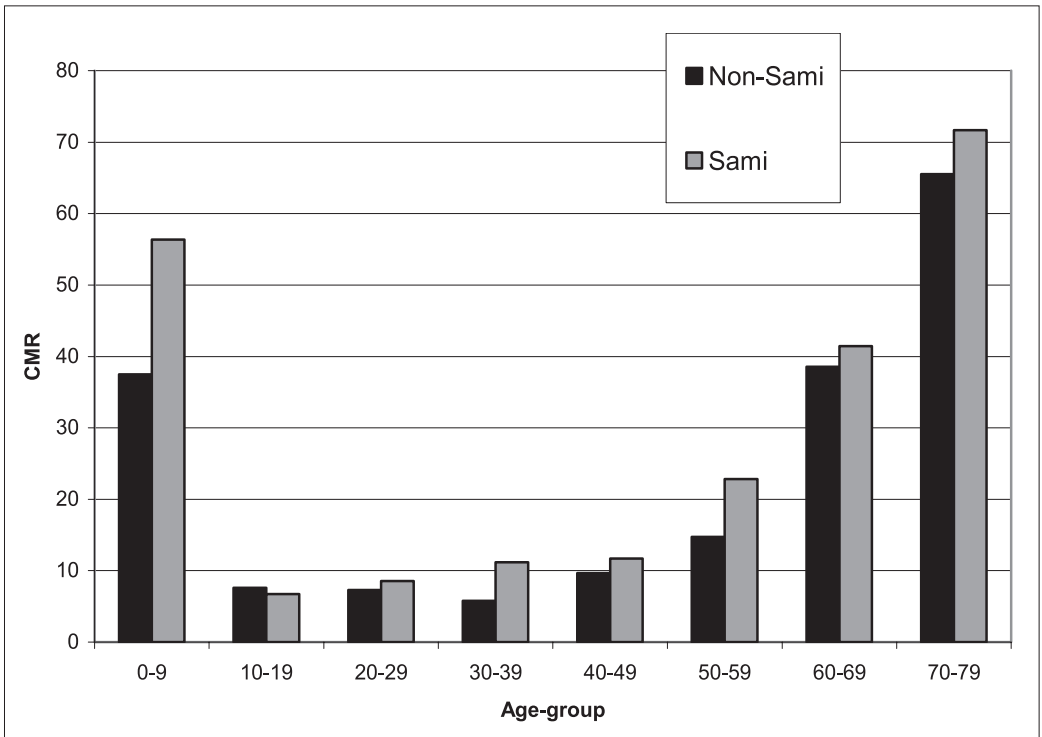


Figure 7. Crude mortality rate (CMR), Sami and non-Sami by age groups, Gällivare, 1776–1815. Source: Demographic Data Base, Gällivare parish.

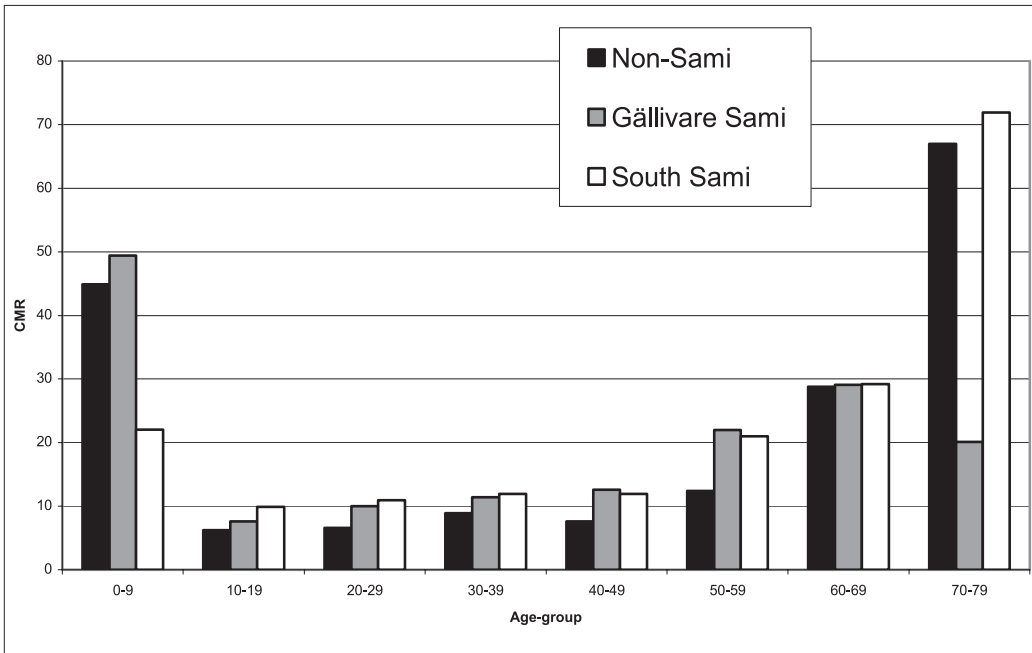


Figure 8. Crude mortality rate (CMR), Sami and non-Sami by age groups, Gällivare and South Sami (Undersåker and Frostviken), 1856–1895. Source: Demographic Data Base, Gällivare, Undersåker and Frostviken parishes.

phases of the epidemiologic transition in an indigenous context. It begins with an investigation of the very early stages of colonization and follows this process for more than a century. The findings accentuate the differences between the mortality patterns of the non-Sami and Sami in Sápmi as compared with the general trend in Sweden.

In 1932, an extensive demographic investigation of the Swedish Sami population was carried out that mirrored a common perception in the late nineteenth and early twentieth centuries, namely, that the Sami people were under threat of extinction. The researcher in charge, Sten Wahlund, concluded that he could note a changing scientific opinion concerning the weakness of the Sami. His project intended to disprove scientific evidence of any possible demographic threats, beginning in the late eighteenth century (33).

Did Wahlund show that there had not been any dangers regarding health and mortality among the Sami population? Not exactly; he was preoccupied with the general problem of extinction and concluded, “The resulting picture is such as might very well apply to, e.g., a European civilised people in the nineteenth century, and in no way is it a picture of the demographic conditions of a dying people” (33). Because Wahlund was able to observe a growing population trend among the Sami, he was bound to conclude that science could strike from its agenda the question of a demographic threat against this indigenous people.

Recent research on historical demography has shown that, during the nineteenth century, there was a considerable difference between the Sami and non-Sami. Infant and childhood mortality rates were often three times higher among the Sami as compared with the settled

population in the area. This had a great impact on crude mortality rates, where Sami life expectancy was considerably lower. However, we must remember that the period of risk was childhood, and when the Sami reached adulthood, their life expectancy exceeded that of the settlers. Severe epidemics of infectious diseases raged throughout the nineteenth century. Measles, scarlet fever, whooping cough, nerve fevers, diphtheria and influenza were only a few of them. Tuberculosis was frequently rife in the northern area, and contributed significantly to the high mortality rates there. Moreover, accidents in the cold climate and complicated childbirths were problems (20,34).

We have studied 2 40-year periods: 1776–1815 and 1856–1895. The long-term trend was an increasing population in all 3 parishes. During the first period, when only Gällivare was under observation, we saw very little change. Kvist has suggested that the Sami population pattern has experienced a certain low level where the indigenous group survived under all circumstances. During better years, the population was able to grow again. He states that this downturn occurred in the 1840s, which seems to be confirmed by our data. Several years of bad weather conditions and disease among the reindeer were reported during the period and high mortality rates accompanied this picture of adversity (35). Sami mortality rates show great fluctuations during the period 1776–1815, almost always peaking at higher rates than in the rest of Sweden. The non-Sami group in Gällivare, on the other hand, had lower mortality rates compared with both Sweden as a whole and the Sami in the parish. The non-Sami experienced a more positive population trend, something that was accentuated during the later period.

During the second half of the nineteenth century, the Sami in Gällivare lost their majority position, and after this shift, the population difference between them and the non-Sami group increased rapidly. The non-territorial parishes in the South Sami area experienced a positive population trend, even if the development stagnated in Frostviken from the 1880s onwards. There were about 10% more women than men in the Sami population, which was equal to the proportion in the rest of Sweden. The non-Sami group had a much more balanced proportion between the sexes, another consequence of colonization and migration.

Many indigenous cultures and societies have ceased to exist. This has often been the result of colonization and the introduction of new epidemiologic regimes (17,18,36–38). Despite previous fears, since the eighteenth century at least, the Sami have not experienced such a threat. Instead, the Sami population's health improved during the nineteenth century. This indicates that they had advanced in the model of epidemiologic transition. A corresponding change was not found for the non-Sami group. Their mortality level remained constant from the late eighteenth century. It seems as though the negative consequences of colonization were faced not only by the indigenous group but also by the settlers. Nevertheless, it must be concluded that no group followed the declining trend in Swedish mortality during the last quarter of the nineteenth century. In the beginning of the twentieth century, Sweden entered the third phase of the epidemiologic transition, while the populations in Sápmi experienced this some decades later. The non-Sami in Gällivare and the South Sami had similar mortality rates from the 1850s onwards, while the Sami in Gällivare experienced a higher rate of

mortality. This indicates that there were differences within the Sami group that have yet to be explained.

The age-specific distribution shows that the Sami in Gällivare experienced consistently higher mortality rates during the period 1776–1815 than did the non-Sami group, especially in the younger age groups. Infant and childhood mortality were high during the nineteenth century. The South Sami group shows strikingly lower mortality rates in the 0–9 age group than does the Sami population in Gällivare. This is another indication of the geographical and cultural mortality differences in the Sami area. The cause of death information is generally deficient in the registers, which is especially true for the younger ages. It is therefore difficult to explain differences from this basis.

The health organization and regulations, information, propaganda and debate involved are important for the understanding of the epidemiologic transition. But the clergy, the administration, midwives and hospitals played different roles when diseases were fought in Stockholm and in Sápmi. There is a need for an improved knowledge concerning many factors involved in the epidemiologic transition. Each discovery must be put into a context that can help us to understand the relativity involved. By doing so, we will improve not only our fundamental knowledge as a base for research but also the knowledge of those studying international long-term trends. Our forthcoming research will focus on other aspects such as life expectancy, causes of death, infant mortality, identity status and the effects of vaccination and medical intervention. That research will more closely follow individuals and families, adding a new dimension to the aggregated statistics. The present study has shown that the digitized material

from Swedish parish registers can provide new insights into population trends in Sápmi.

Acknowledgements

The research project is funded by Swedish Council for Working Life and Social Research and is a part of the activities at the Centre for Population Studies at Umeå University. Thanks to Abbas Haghjo, Carin Hedlund, Maria Larsson and Maria Wisselgren at the Demographic Data Base for the preparation of data files; to Anna Pettersson at the Department of Social and Economic Geography, Umeå University, for assistance with the map; and a special thanks to Henrik Holmberg at the Department of Statistics, Umeå University, for invaluable help with the calculations.

REFERENCES

1. Hassler S. The health conditions in the Sami population of Sweden, 1961–2002: causes of death and incidences of cancer and cardiovascular diseases. Umeå: Umeå University, Epidemiology and Public Health Sciences, Department of Public Health and Clinical Medicine; 2005. 71 pp.
2. Sköld P. Kunskap och Kontroll – Den svenska befolkningsstatistikens historia. Umeå: Report No. 17. From the Demographic Data Base. Stockholm: Almquist and Wiksell; 2001. 432 pp. (in Swedish)
3. Runeberg EF. Om Svea rikes folknummer och naturliga styrka. Kungliga Vetenskaps Academiens Handlingar För År 1764;25:81–115. (in Swedish)
4. Johansson H. Samerna i den svenska befolkningsutvecklingen. In: Forskare om befolkningsfrågor. Blandvetenskaplig bilaga till Ett folks biografi. Stockholm: Samarbetskommittén för långtidsmotiverad forskning; YEAR? pp. 319–389. (in Swedish)
5. Thomasson L. Om lapparna i Jämtland och Härjedalen: folkmängden och dess förändringar under ett århundrade. Stockholm: Almquist and Wiksell; 1956. 79 pp. (in Swedish)
6. Omran AR. The epidemiologic transition: a theory of the epidemiology of population change. *Millbank Q* 2005;83:731–757.
7. Caldwell JC. Population health in transition. *Bull World Health Organ* 2001;79:159–160.
8. Bjerregaard P, Young TK, Dewailly E, Ebbesson SOE. Indigenous health in the Arctic: an overview of the circumpolar Inuit population. *Scand J Public Health* 2004;32:390–395.

9. Caldwell JC. Aboriginal society and the global demographic transition. In: Briscoe G, Smith L, editors. *The aboriginal population revisited: 70,000 years to the present*. Canberra: Aboriginal History Inc. Aboriginal History Monograph No. 10. CITY: PUBLISHER; 2002. pp. 160–169.
10. Hetzel BS. Historical perspectives on indigenous health in Australia, Asia Pacific. *J Clin Nutr* 2000;9:157–163.
11. Kunitz SJ. Public policy and mortality among indigenous populations of Northern America and Australasia. *Popul Devel Rev* 1990;16:47–672.
12. Kunitz SJ. *Disease and social diversity: the European impact on the health of non-Europeans*. Oxford: Oxford University Press; 1994. 209 pp.
13. Stephens C, Porter J, Nettleton C, Willis R. Disappearing, displaced, and undervalued: a call to action for indigenous health world wide. *Lancet* 2006;367:2019–2028.
14. Thornton R. Aboriginal North American population and rates of decline, ca. A.D. 1500–1900. *Curr Anthropol* 1997;38:310–315.
15. Trovato F. Aboriginal mortality in Canada, the United States and New Zealand. *J Biosoc Sci* 2001;33:67–86.
16. Young TK. Recent health trends in the Native American population. *Population Research and Policy Review* 1997;16:147–167.
17. Kelm ME. *Colonizing bodies: Aboriginal health and healing in British Columbia 1900–1950*. Vancouver: UBC press; 1998. 248 pp.
18. Crosby A. *Ecological imperialism: the biological expansion of Europe, 900–1900*. Cambridge: Cambridge University Press; 1986. 368 pp.
19. Sköld P. Escape from catastrophe: the Saami's experience with smallpox in eighteenth- and nineteenth-century Sweden. *Soc Sci Hist* 1997;21:1–25.
20. Sköld P. Liv och död i Lappmarken. Demografiska aspekter på förehållandena i Pite lappmark. In: Sköld P, Lantto P, editors. *Befolkning och bosättning i norr. Etnicitet, identitet och gränser i historiens sken*, Umeå: Centrum för Samisk forskning; 2004. pp. 85–105. (in Swedish)
21. Axelsson P, Sköld P. Indigenous populations and vulnerability: characterizing vulnerability in a Sami context. *Ann Demogr Hist (Paris)* 2006;1:115–132.
22. Kertzer DI. The proper role of culture in demographic explanation. In: Jones GW, Douglas RM, Caldwell JC, D'Souza R, editors. *The continuing demographic transition*. Oxford: Clarendon Press; 1997. pp. 137–157.
23. Rosendahl HV. Statistiska förhållanden bland Sveriges nomadfolk. *Hygiea. Medicinsk och Farmaceutisk Månadsskrift* 1892;54:516–529. (in Swedish)
24. *Sveriges församlingar genom tiderna*. Stockholm: Skatteförvaltningen Riksskatteverket; 1989. 584 pp. (in Swedish)
25. Forsström G, Strand B. *Gällivare kommun, skrifter del 2. Gällivare tätort och landsbygd*. Luleå: Norrbottens museum; 1977. 150 pp. (in Swedish)
26. Lundmark L. Samernas skatteländ i Norr- och Västerbotten under 300 år. Serien III. Rättshistoriska skrifter, åttonde bandet. Stockholm: Institutet för rättshistorisk forskning; 2006. 207 pp. (in Swedish)
27. *Befolkningsutvecklingen under 250 år: historisk statistik för Sverige*. Stockholm: Statistiska centralbyrån 1999. 162 pp. (in Swedish)
28. Brändström A, Edvinsson S, Rogers J. Illegitimacy, infant feeding practices and infant survival in Sweden, 1750–1950: a regional analysis. *Hygiea Internationalis* 2002;3:13–52.
29. Taylor J. Transformation of the indigenous population: recent and future trends. Centre for aboriginal economic policy research publications 2000; 1994. 36 pp.
30. Ring I, Brown N. The health status of indigenous peoples and others. *BMJ* 2003;327:404–405.
31. Foliaki S, Pearce N. Changing pattern of ill health for indigenous people: control of lifestyle is beyond individuals and depends on social and political factors. *BMJ* 2003;327:406–407.
32. Kinfu Y, Taylor J. On the components of indigenous population change. *Australian geographer* 2005;36: 233–255.
33. Wahlund S. Demographic studies in the nomadic and the settled population of northern Lapland. Uppsala: Almquist and Wiksell; 1932. 133 pp.
34. Brändström A. Från förebild till motbild: spädbarnsvård och spädbarnsdödighet i Jokkmokk. In: Åkerman S, Lundholm, K, editors. *Älvdal i norr*. Umeå: Umeå universitet; 1990. pp. 307–351. (in Swedish)
35. Kvist R. Rennomadismens dilemma. Det rennomadiska samhällets förändring i Tuorpon och Sirkas 1760–1860. Umeå: Umeå universitet; 1989. 59 pp. (in Swedish)
36. Levinson D. *Ethnic Relations. A Cross-Cultural Encyclopedia*. Santa Barbara: ABC-CLIO; 1994. 293 pp.
37. Coates KS. *A global history of indigenous peoples: struggle and survival*. New York: Palgrave Macmillan; 2004. 297 pp.
38. Moffat T, Herring A. The historical roots of high rates of infant death in aboriginal communities in Canada in the early twentieth century: the case of Fisher River, Manitoba. *Soc Sci Med* 1999;48:1821–1832.

Professor Peter Sköld
 Centre for Sami Research (CeSam)
 Umeå University
 SE-901 87 Umeå
 SWEDEN
 Email: peter.skold@cesam.umu.se