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# Changes in causes of death and mortality rates among children in Greenland from 1987–91 to 1992–99

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*Aims*: This study analysed the spontaneous trends in mortality among children in Greenland from 1987–91 to 1992–99 and describes the changes in the causes of death, mortality rates, and variation between regions. *Methods*: The data are based on the Greenland Registry of Causes of Death and the birth registry of the Medical Office of Health in Greenland. The causes of death and relevant mortality rates, the trends over time and the differences between regions were analysed epidemiologically for 1992–99 and compared with those for 1987–91. *Results*: From 1992 to 1999, 8,709 children were born in Greenland. The data include information on 313 child deaths during this period: 64 stillbirths, 158 deaths before one year of age (infants) and 91 deaths between one and 14 years of age. There were fewer stillbirths due to placenta previa, abruptio placentae, and prematurity, fewer infants died from birth asphyxia and infectious diseases and fewer children aged 1–14 years died from accidents in 1992–99 compared with 1987–91. Infant mortality in Greenland declined from 25.2 per 1,000 live births to 18.3 and mortality among children 1–14 years old from 122.7 per 100,000 person-years to 80.4 between 1987–91 and 1992–99. Mortality dropped proportionally more in East Greenland. *Conclusion*: The decline in child mortality in all age groups probably resulted from general societal trends and general improvement in the healthcare system. Child mortality is still unacceptably high, and it is recommended that sectors other than healthcare become aware of their responsibility for preventing the high rate of child mortality.

*Key words:* children, cause of death, Greenland, infant mortality, mortality, regional differences, socioeconomic factors.

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## INTRODUCTION

Greenland is part of the Kingdom of Denmark and is the world's largest island. An ice cap covers 85% of Greenland's territory. The distance from the northernmost point to the southernmost point is 2,670 km. The population on 1 January 2000 was 56,124, of whom 88% were born in Greenland (1). The 17 towns had 45,714 inhabitants, and 10,410 (19%) lived in villages and other small settlements. Nuuk, the capital, has about 14,000 inhabitants (25% of the population). There are no roads outside the towns; transport between towns is by sea or air and by snowmobiles and dog sledge in the winter in districts north of the Arctic Circle and on the east coast.

There are pronounced regional variations in lifestyle and living conditions in Greenland. In the capital and in the biggest towns on the central west coast most people are wage earners who buy their food in supermarkets that abound with imported goods. In the more remote villages, on the other hand, subsistence hunting and fishing play an important role. Housing standards are higher in the towns than in the villages. In general, the further one moves from the capital, the less affluent and westernized are the communities. Adult literacy is approaching 100% throughout the country. Unemployment rates vary among municipalities but there is no distinct regional trend.

The Greenland Home Rule Government assumed responsibility for healthcare on 1 January 1991. Greenland's territory is divided into 17 healthcare districts that largely follow the boundaries of the municipalities. Dronning Ingrids Hospital in Nuuk is the national hospital and has 156 beds and numerous specialist physicians associated with it. Each health district has a health centre with one or more physicians, nurses, and other healthcare personnel appropriate to the number of people living in the district. Each district health centre is responsible for primary healthcare in towns, villages, and other small settlements, and the health centres treat all normal illnesses,

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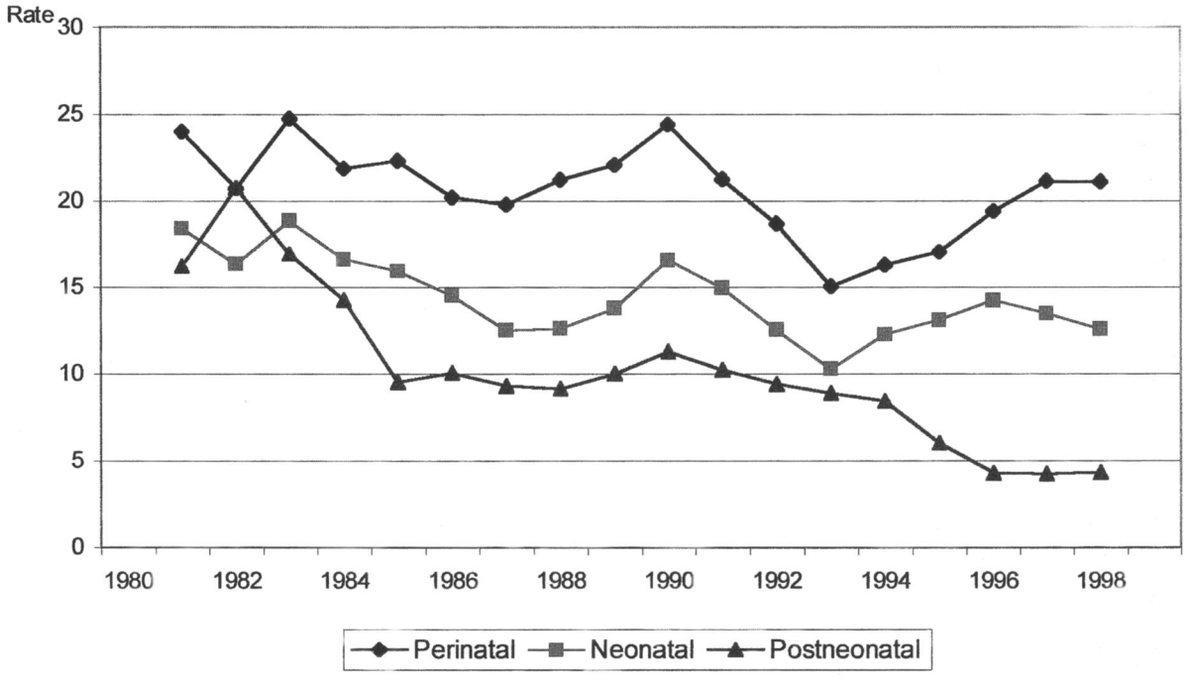


*Fig. 1.* Perinatal, neonatal, and post-neonatal mortality in Greenland, 1980–99 (three-year moving averages).

somewhat similar to a large general practice in Denmark. The health centres handle uncomplicated births, minor surgery, normal treatment in internal medicine, and community mental health services. The centres have a number of inpatient beds proportional to the number of people in the health district. People with more complicated illnesses are referred to Dronning Ingrids Hospital in Nuuk or to specialized treatment in Denmark or Iceland. In principle, prenatal care, health check-ups, and immunization for children are organized similarly to the system in Denmark.

Compared with Denmark, many aspects of lifestyle and living conditions are less favourable for child survival in Greenland. Among the most important, socioeconomic factors including housing and income are poorer in Greenland, tobacco smoking is prevalent (78% of adult women are current cigarette smokers), and healthcare is less developed.

Mortality among children is very high in Greenland. A study of all deaths among children from 1987 to 1991 (2, 3) found an infant mortality rate of 25 per 1,000 live births in Greenland versus eight in Denmark. The elevated mortality continued later in childhood, as the mortality rate was 1.2 per 1,000 children per year among children 1–14 years of age, five times as high as the rate in Denmark. Greenland's regions differed dramatically, and the rates were strongly associated with social factors and the mother's lifestyle. The healthcare system also had a role: 40% of the perinatal and neonatal deaths were classified as potentially avoidable if the standard of care had been equivalent to that of a fictive medium-sized hospital in Denmark.

Based on these results, the Directorate of Health in Greenland in 1993 decided to initiate activities to systematically reduce child mortality (4). The activities in the programme were: (a) establishing a perinatal and paediatric death review committee, (b) a training programme for healthcare workers, (c) purchase of medical equipment and (d) establishing a combined birth and child death register. Nevertheless, this programme was never completed, and the only activity initiated was the training programme (5). However, after five years only 30% of the specially trained healthcare workers were still working in the healthcare system.

The purpose of the present study was to analyse child mortality in Greenland in 1992–99 and to describe the changes in the causes of death, mortality rates, and variation between regions since 1987–91.

## MATERIAL AND METHODS

The data on stillbirths and child deaths from 1992 to 1999 are based on the Greenland Registry of Causes of Death, which is compared with and supplemented by information from Statistics Greenland and the Medical Office of Health in Greenland. The healthcare districts in Greenland send death certificates to the

Medical Office of Health in Greenland, which registers the deaths in its own registry and sends the certificates to the National Board of Health in Denmark, where the causes of death are coded in accordance with the International Classification of Diseases (ICD). ICD-8 was used until the end of 1993 and ICD-10 thereafter. The coded information is sent to the Greenland Registry of Causes of Death maintained by Statistics Greenland, which updates the information according to the data in the Civil Registration System and adds supplementary information such as deaths of residents of Greenland occurring in Denmark and deaths registered without a death certificate (such as the presumed deaths of people missing at sea). Thus, the final result is the Greenland Registry of Causes of Death.

When the study was initiated, the Greenland Registry of Causes of Death had only been updated until the end of 1995 and contained information on 153 children 0–14 years old who died from 1992 to 1995. Information on stillbirths and deaths since 1995 was based on the original death certificates and was coded by one of the authors according to ICD-10. The data were entered twice on the computer and checked against the original death certificates. Of the 8,709 children born from 1992 to 1999, 23 lacked information about the municipality of residence (0.3%) and 100 lacked the code for village or town (1.1%). Statistics Greenland provided information on the distribution of the population according to gender and age as well as residence (1). Data from 1987–91 are used for comparison in addition to other data from the Greenland Registry of Causes of Death and the Danish Medical Birth Registry (6).

In order to study the geographical variation in mortality, the many small towns and villages of Greenland were categorized into eight regions (Table I). The regions were defined by geographic criteria and on the basis of community size. The capital, Nuuk, and the towns on the central west coast are the most westernized and affluent regions while the peripheral regions (East Greenland, North Greenland) and the villages are the least affluent regions. The regional variation of socioeconomic conditions, housing, and diet are pronounced.

The data were analysed using SPSS version 9.0 and Epi-Info version 6.0. Significance was evaluated by the chi-square test and 95% confidence intervals (CI) for relative risk (RR).

## RESULTS

Of the 153 child deaths registered in the Greenland Registry of Causes of Death for 1992–95 when this study started, 14 were stillbirths. Many data were seriously flawed: 29 deaths (19%) were registered without a cause of death, two without the municipality of residence, two without gender, 22 (14%) without the municipality in which the death occurred and one with an incorrect date, and two cases were registered twice. One homicide was registered as a suicide. In addition, there were countless less serious mistakes that were not quantified. The Medical Office of Health in Greenland had information on 315 deaths for 1992–99, including two registered twice. Most death certificates were poorly completed but included the likely causes of death.

The combined and revised data set contained information on 313 deaths registered for 1992–99: 64 stillbirths, 158 deaths among children under one year, and 91 among children 1–14 years of age. An inquest had been conducted in 49 cases (16%), and four children under one year and four children 1–14 years old had been autopsied.

Among the infant deaths 92 (58%) occurred within the first week of life, and half of these within the first day of life. A total of 104 (66%) occurred in the first month of life, and the rest were relatively evenly distributed across the first year of life. Stillbirths and infant deaths were equally distributed among boys and girls, whereas the boy–girl ratios were 1.6 for deaths among children 1–4 years old and 1.8 among those 5–14 years old. The gender difference was statistically significant ($p<0.05$) for the age group 1–14 years.

The most common cause of stillbirth (Table II) was

Table I. *Regions of Greenland as defined in this study with the population as of 1 January 2000 and the average annual number of births (including stillbirths and live births) from 1992 to 1999*

| Geographical area | Towns | Villages |
|---|---|---|
| Nuuk | Region 1 Pop. 13,169 225 births | |
| Southwest: south and central Greenland | Region 2 Pop. 16,370 315 births | Region 5 Pop. 3,629 74 births |
| Northwest: Disko Bay and the northern part of western Greenland | Region 3 Pop. 13,115 251 births | Region 6 Pop. 4,762 113 births |
| Eastern Greenland | Region 4 Pop. 2,220 55 births | Region 7 Pop. 1,251 33 births |
| Northern Greenland | Region 8 Pop. 857 21 births | |

Table II. *Causes of death in Greenland for 1992–99 and 1987–91 among stillbirths per 1000 births, neonatal (0–27 days of life) and post-neonatal (28–364 days of life) infants per 1,000 live births and children 1–14 years old per 100,000 person-years*

| | 1987–1991 | | 1992–1999 | | | |
|---|---|---|---|---|---|---|
| Causes of death | *n* | Rate | *n* | Rate | Ratio | 95% CI |
| Stillbirths | | | | | | |
| Congenital abnormalities | 4 | 0.7 | 6 | 0.7 | 1.03 | 0.29–3.63 |
| Unexplained intrauterine death | 13 | 2.2 | 20 | 2.3 | 1.07 | 0.53–2.12 |
| Placenta previa or abruptio placentae | 21 | 3.5 | 15 | 1.7 | 0.49 | 0.25–0.95 |
| Birth asphyxia | 6 | 1.0 | 11 | 1.3 | 1.26 | 0.47–3.40 |
| Prematurity | 11 | 1.8 | 2 | 0.2 | 0.12 | 0.03–0.56 |
| Birth lesions | 0 | 0 | 1 | 0.1 | – | – |
| Other perinatal diseases | 2 | 0.3 | 9 | 1.0 | 3.09 | 0.67–14.3 |
| Total | 57 | | 64 | | | |
| Neonatal infants | | | | | | |
| Infectious diseases | 2 | 0.3 | 2 | 0.2 | 0.68 | 0.10–4.86 |
| Congenital abnormalities | 14 | 2.4 | 21 | 2.4 | 1.03 | 0.52–2.02 |
| Placenta previa or abruptio placentae | 8 | 1.4 | 11 | 1.3 | 0.94 | 0.38–2.34 |
| Birth asphyxia | 26 | 4.4 | 12 | 1.4 | 0.32 | 0.16–0.63 |
| Prematurity | 22 | 3.7 | 49 | 5.7 | 0.53 | 0.92–2.53 |
| Birth lesions | 3 | 0.5 | 2 | 0.2 | 0.46 | 0.08–2.73 |
| Other perinatal diseases | 7 | 1.2 | 6 | 0.7 | 0.59 | 0.20–1.75 |
| Other diseases | 1 | 0.2 | 0 | 0 | – | – |
| Accidents | 0 | 0 | 1 | 0.1 | – | – |
| Total | 83 | | 104 | | | |
| Post-neonatal infants | | | | | | |
| Infectious diseases | 23 | 3.9 | 11 | 1.3 | 0.33 | 0.16–0.67 |
| Congenital abnormalities | 7 | 1.2 | 9 | 1.0 | 0.88 | 0.33–2.37 |
| Perinatal diseases | 0 | 0 | 4 | 0.5 | – | – |
| Sudden infant death syndrome | 20 | 3.4 | 20 | 2.3 | 0.68 | 0.37–1.27 |
| Other diseases | 11 | 1.9 | 1 | 0.1 | 0.06 | 0.00–0.48 |
| Accidents | 5 | 0.8 | 6 | 0.7 | 0.82 | 0.25–2.69 |
| Homicides | 0 | 0 | 3 | 0.3 | – | – |
| Total | 66 | | 54 | | | |
| 1–14 years old | | | | | | |
| Infections | 9 | 14.2 | 22 | 19.5 | 1.38 | 0.63–2.99 |
| Malignancies | 1 | 1.6 | 1 | 0.9 | 0.56 | 0.04–9.00 |
| Congenital abnormalities | 10 | 15.7 | 8 | 7.1 | 0.45 | 0.18–1.14 |
| Other diseases | 8 | 12.6 | 6 | 5.3 | 0.35 | 0.11–1.08 |
| Accidents | 43 | 67.7 | 38 | 33.7 | 0.50 | 0.32–0.77 |
| Suicides | 3 | 4.7 | 9 | 8.0 | 1.88 | 0.52–6.82 |
| Homicides | 4 | 6.3 | 7 | 6.2 | 0.84 | 0.24–2.99 |
| Total | 78 | | 91 | | | |

unexplained intrauterine fetal death (32%) followed by placenta previa and abruptio placentae (24%) and asphyxiation (17%). The most frequent cause of death in the first seven days of life was prematurity (48%). Sudden infant death syndrome was the most common cause from 28 to 364 days of life. Of the 20 cases (37%), the cause was determined by autopsy in only one case, by inquest in 12 cases and by normal medical examination in seven cases. Infection was the primary cause of death among 20% of those 28–364 days old, 36% of those 1–4 years and 15% among those 5–14 years. Information on the type of infection was not available. Violent causes of death such as accidents, homicide, and suicide were more common among older children. More boys than girls died from violent events both among children 1–4 years old (RR = 4.6, 95% CI 1.3–15.9) and 5–14 years old (RR = 2.3, 95% CI 1.1–4.6). The mortality rate from violent death was higher in villages than in towns (RR = 1.7, 95% CI 1.0–2.8): 13 deaths from accidents in villages and 31 in towns, four versus five for suicide and two versus eight for homicide. The nine suicide deaths were among children 11–14 years old, comprising 19% of all deaths among children 5–14 years old. Drowning was the cause of death for 14 (37%) of the 38 one- to 14-year-old children, who died from

accidents, five (13%) died from shooting accidents, and five (13%) from fire accidents. The observed decline in deaths caused by accidents among children aged 1–14 years (Table II) is evenly distributed among different types of accident.

The rates of stillbirths due to placentae previa, abruptio placentae, or prematurity declined significantly from 1987–91 to 1992–99 (Table II). Other statistically significant declines in mortality were seen for birth asphyxia among neonatal infants and for infections among post-neonatal infants and accidents among older children, whereas the decline in sudden infant death syndrome was not statistically significant.

Mortality among children in all age groups in Greenland exceeded the rates in Denmark for 1992–99 (Table III) but declined relative to 1987–91. The rate of stillbirth in Greenland fell from 9.5 to 7.3, but stillbirths still comprised 41% of all perinatal deaths (before seven days of life) in both periods, which is fewer than in Denmark (60%). The reduction in infant deaths was greatest after the first 27 days of life.

The mortality rates in Greenland's regions varied in both time periods. The combined stillbirth and infant mortality rate was lowest in the town of Nuuk, higher in the rest of south-western Greenland and highest in eastern and northern Greenland. The regional variation in mortality among children 1–14 years old was similar. The combined stillbirth and infant mortality rate in Nuuk remained nearly constant from 1987–191 to 1992–99 (Table IV) but declined in other regions, especially in villages, and was most pronounced in the villages in eastern Greenland. Mortality among children 1–14 years of age was halved in south-western Greenland, increased in towns in eastern Greenland and declined slightly in other regions. Northern Greenland had no deaths in this age group from 1987 to 1999.

## DISCUSSION

The routine registration of causes of death and of births in Greenland is uncertain. We found substantial disagreement between the Greenland Registry of Causes of Death and information from the Medical Office of Health in Greenland and from Statistics Greenland. Nevertheless, our comparison and revision process made it very likely that the material covers all child deaths from 1992 to 1999. Some underreporting of stillbirths cannot be excluded, however.

Prenatal care is supposed to function similarly to that in Denmark in principle but differs in practice. Greenland has few trained midwives; 4.9% of women giving birth in 1994 had not seen a physician during pregnancy and 2.0% of all births took place outside hospital (7). The information on birth certificates, which are completed by the person assisting with the birth and comprise the basis for the birth registry of the Medical Office of Health in Greenland, are not validated, and this registry does not include information on late miscarriages.

The data used for the Greenland Registry of Causes of Death are based on information from death certificates, which are issued by a medical examiner. An assessment of the quality of the registration of causes of perinatal and neonatal deaths in Denmark has shown some misclassification due to incorrect completing of death certificates; in contrast, deaths are classified very precisely through the ICD coding at

Table III. *Child mortality rates in Greenland for 1987–91 and 1992–99 and in Denmark for 1996 according to age: perinatal deaths per 1,000 births, infant deaths per 1,000 live births and deaths among children 1–14 years per 100,000 person-years (ratios with 95% confidence intervals in parentheses)*

| | Rate | Rate | Rate | Ratio | 95% CI | Ratio | 95% CI |
|---|---|---|---|---|---|---|---|
| Age group | Greenland 1987–91 | Greenland 1992–99 | Denmark 1996 | Greenland 1992–99/ Denmark 1996 | | Greenland 1992–99/ 1987–91 | |
| Perinatal | | | | | | | |
| Stillbirths | 9.5 | 7.3 | 4.8 | 1.55 | 1.23–2.14 | 0.77 | 0.54–1.10 |
| 0–6 days | 13.2 | 10.6 | 3.2 | 3.31 | 2.61–4.26 | 0.80 | 0.59–1.08 |
| Total | 22.8 | 17.9 | 8.0 | 2.13 | 2.01–2.90 | 0.79 | 0.63–0.99 |
| Infants | | | | | | | |
| Neonatal 0–27 days | 15.0 | 12.0 | 3.9 | 3.08 | 2.56–4.10 | 0.80 | 0.60–1.06 |
| Post-neonatal 28–364 days | 10.1 | 6.3 | 1.6 | 3.94 | 3.39–6.83 | 0.62 | 0.43–0.89 |
| Total | 25.2 | 18.3 | 5.5 | 3.33 | 3.03–4.45 | 0.73 | 0.58–0.91 |
| 1–14 years | | | | | | | |
| 1–4 years | 186.0 | 118.2 | 30.1 | 3.93 | 2.74–5.90 | 0.64 | 0.42–1.00 |
| 5–14 years | 92.4 | 61.8 | 14.6 | 4.23 | 2.93–6.13 | 0.67 | 0.44–1.03 |
| Total | 122.7 | 80.4 | 19.4 | 4.14 | 3.01–5.07 | 0.66 | 0.48–0.89 |

Table IV. *Child mortality in Greenland according to region: combined stillbirths and infant deaths per 1,000 births and deaths among children 1–14 years per 100,000 person-years, with the ratio for the rate for 1992–99 to the rate for 1987–91 and 95% confidence intervals in parentheses*

| | Stillbirths and infant deaths | | | | 1- to 14-year-old children | | | |
|---|---|---|---|---|---|---|---|---|
| | 1992–99 | | | | 1992–99 | | | |
| Region | *n* | Rate | Ratio | 95% CI | *n* | Rate | Ratio | 95% CI |
| Towns | | | | | | | | |
| Nuuk | 30 | 16.7 | 1.09 | 0.60–1.96 | 8 | 35.3 | 0.85 | 0.28–2.60 |
| Southwest | 63 | 25.0 | 0.79 | 0.55–1.13 | 15 | 45.8 | 0.47 | 0.24–0.93 |
| Northwest | 50 | 24.9 | 0.76 | 0.51–1.14 | 26 | 98.1 | 0.63 | 0.36–1.09 |
| East | 24 | 55.0 | 0.83 | 0.44–1.56 | 12 | 238.0 | 1.21 | 0.43–3.44 |
| Villages | | | | | | | | |
| Southwest | 12 | 20.3 | 0.73 | 0.33–1.64 | 6 | 73.7 | 0.89 | 0.25–3.14 |
| Northwest | 31 | 34.3 | 0.59 | 0.36–0.97 | 15 | 129.0 | 0.61 | 0.29–1.28 |
| East | 5 | 19.2 | 0.20 | 0.07–0.57 | 9 | 265.0 | 0.71 | 0.28–1.80 |
| North Greenland | 7 | 41.9 | 0.71 | 0.24–2.09 | 0 | 0.0 | – | |
| All Greenland | 222 | 25.5 | 0.73 | 0.60–0.89 | 91 | 80.4 | 0.66 | 0.48–0.89 |

Denmark's National Board of Health when the death certificates are completed correctly (8, 9). The registration of causes of child deaths in Greenland is similarly problematic; the death certificates are always completed by a medical examiner, but paediatric and neonatal specialists are seldom available, few autopsies are performed, many deaths occur in remote areas with variable availability of physicians and sometimes a physician has to complete the death certificate based on information provided by another person. We attempted to minimize validity problems in this study by grouping diagnoses in broad categories and do not consider it important that some causes of death for 1992–99 were ICD coded by the National Board of Health and some by us. The causes of death for 1987–91 were classified based on an exhaustive perusal of all available healthcare records, while those for 1992–99 were classified based on death certificates, and the differences in the frequency of the diagnoses are therefore uncertain. Despite some uncertainty about stillbirths, perinatal deaths seem to have declined overall.

Previous research has shown that mortality has declined among children in all age groups in Greenland since 1950 and that the trends and levels in infant mortality are similar to those in Denmark 30 years previously (10, 11). The present study also found this pattern. The reduction in infant mortality mostly occurred after 28 days of life, with a substantial reduction in deaths caused by infection. Sudden infant death syndrome was the most common cause of death from 28 to 364 days of life, but the validity of this diagnosis is uncertain in Greenland as only an autopsy can determine this cause and this occurred only once from 1992 to 1999. Hence the high rate of sudden infant deaths is probably at least partly due to over-recording. This needs to be explored further in future studies. Greenland has not had a campaign similar to the other Nordic countries to prevent sudden infant death syndrome by avoiding sleeping in the prone position, hyperthermia, and tobacco smoking. This campaign in Denmark reduced the incidence of such deaths by nearly 30% from 1989 to 1992 (12).

The role of the healthcare system in reducing infant mortality in Greenland has not been determined. The assumption of responsibility for healthcare by the Greenland Home Rule Government in 1991 has not produced visible organizational or structural improvement in obstetric or paediatric services, and the decline in infant mortality has probably therefore resulted from changes in various factors such as decreased alcohol consumption, and improved education, housing conditions, and other socioeconomic factors (13–17). The decline in the mortality rate among older children is probably not related to the healthcare system either. This study found a high incidence of suicide among the oldest children, but knowledge of mental health and mental disorders among children in Greenland is limited.

Greenland's regions differ in many ways: healthcare services, economic opportunities, housing, transport, and occupation. All these factors influence health status. The villages generally have lower average household income than do the towns, and socioeconomic conditions become increasingly poor the further north and east the area is from Nuuk in southwestern Greenland. The regional variation in mortality is based on relatively few deaths in each region, and the variation is not statistically significant.

Nevertheless, this study confirms the previous geographical trend with lowest child mortality in Nuuk, slightly higher in the rest of south-western Greenland, somewhat higher in north-western Greenland and highest in eastern Greenland (2).

## CONCLUSIONS

The decline in child mortality in Greenland probably resulted from general societal trends and general improvement in the healthcare system. Child mortality is still unacceptably high, and we recommend establishing a permanent perinatal and paediatric death review committee to analyse all child deaths. A combination of the birth registry of the Medical Office of Health in Greenland and the Greenland Registry of Causes of Death would improve the possibilities for timely mortality analyses. Information is lacking in Greenland on the relationship between children's living conditions during childhood and their health status. A child cohort was established in Greenland in 1998 to study the effects of early exposure to environmental pollutants, alcohol, tobacco, infections, and other factors on neurobehavioural and physical development, and future information from this cohort is expected to improve the potential for preventing illness, promoting health, and improving the well-being of children in Greenland. During the last year the perinatal services in the rural areas in Greenland have been reviewed, new guidelines have been elaborated and are now been implemented. Many of the deaths in our study are due to avoidable perinatal factors such as, for instance, placenta praevia, and well-established perinatal auditing should be able to provide a sound foundation for intervention. The present efforts by the healthcare services for villages and by Paarisa (the division of health promotion and disease prevention of Greenland's Directorate of Health) to improve health in the villages and to change the population's habits in consuming alcohol and tobacco need to be strengthened. Further, the social sector and the education, housing, labour market, and business sectors must be made aware of their responsibility for preventing Greenland's high rates of child mortality.

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