Modernization and Mental Health: Suicide among the Inuit in Greenland

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Foreword

This report is written for those working in the field of suicide prevention and suicide research in Greenland, and all who share a general interest in the people of Greenland. The aim of this report is to shed some light on the 'incomprehensible' high numbers of suicide in Greenland since the mid 1970's and to point out directions for future research.

I'm indebted to many people who made the writing of this report possible. First and foremost I would like to thank Peter Bjerregaard and Tine Curtis for sharing their knowledge on medical and social research in Greenland, and for giving me the possibility to spend three month of internship at the National Institute of Public Health in Copenhagen. Special thanks to Paul Voestermans, Cor Baerveldt and Ella Arensman for their encouraging support, creative comments and help throughout this study. I owe much to Jette Jensen from Statistics Greenland, the people from the medical office and the police office in Nuuk for their cooperation during my visit to Greenland. The Department of Health and Ecclesiastical Affairs, Greenland, has financially supported this study, allowing me to travel to Greenland and collect the data.

Last but not least my thanks go to all who supported me during the process of this study, most of all my parents, friends and fellow students.

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Summary

This report addresses the high suicide rates in Greenland. The leitmotif is the relationship between the recent increase of suicide rates and the postwar-modernization of Greenland. Fist, an update of earlier studies on the epidemiology of suicide rates is presented. The data show that in the first half of the 1990's suicide rates appear to have stabilized, though they remain extremely high and suicide is regarded as a persistent public health problem in Greenland. After a description of suicide rates, specified by sex, age and different regions of Greenland, general characteristics of the background of suicides are described. Based on an examination of death certificates and police reports for the period 1993-1995, frequent conflict within the family and with friends, a recent life-threatening experience, expressing suicidal intentions and the acute abuse of alcohol are identified as the most common characteristics among suicides. Next, possible explanations of the high suicide rates are discussed in relationship to recent historical developments in Greenland. Sociodemographic indicators of suicide are presented and the temporal distribution of regional suicide rates is examined more closely. The results indicate a general relationship between regional suicide rates and postwar-modernization, indicated by a distinct pattern of suicide rates among regions in correspondence with the progress of postwar-modernization in the regions. Finally, directions for future research are presented and possible implications for intervention and prevention are discussed.

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1. Introduction

In recent decades Greenland has undergone a painful process of social transition. Within the past 50 years the traditional Inuit society has experienced the process of so called modernization. The emergence of new economic, social and political structures has led to a reorganization of the Greenlandic society. The Inuit had to find ways to adopt to modern economic and social standards, and at the same time to maintain their cultural heritage. Traditional hunting is no longer sufficient to satisfy the economic needs and the Inuit are breaking away from their former traditional life and are moving into a modern wage-earners society. Within this process social pathologies and public health problems emerged, giving rise to great concern.

Most alarming has been the increase in suicides. These rates are now among the highest suicide rates in the world. Particularly among males aged 15-25, but also among other age-groups and women, suicide rates are extremely high. Suicide is one of a number of socio-medical problems that have emerged in recent decades, as does the widespread use of alcohol and the increasing rates of violence and homicide. Since the mid 1970's the number of suicides has increased continually. In the early 1970's suicide rates were below 50 per 100.000, while in the late 1980's rates increased up to 120 per 100.000 population. This is the fivefold of suicide rates in most other European countries. The high number of suicides presents a major public health problem in Greenland and the on-going social transformation of the society seems to play a predominant role in the development of high suicide rates.

Other circumpolar regions have experienced a similar increase in the prevalence of suicide. In the 70's and 80's an increasing number of suicides has been noticed among indigenous communities in Alaska and the Canadian North West Territories. Not only the prevalence of suicide, but also demographic characteristics of those committing suicide are almost identical throughout the circumpolar region. Most often suicides are committed by young native males using highly lethal methods. Like in Greenland the development of high suicide rates was paralleled by rapid social and cultural changes in these regions. However, suicide rates in Greenland are higher than in most other circumpolar regions and the Inuit in Greenland seem to be most vulnerable.

Every suicide comes as a tremendous shock to the communities. Most of the population in Greenland live in small settlements, with often less than thousand inhabitants. Consequently, every suicide has a tremendous impact on the life in the communities. Health organizations have called for action. Suicide is clearly one of the most urgent public health problems in Greenland. Along with other forms of violence

and self-destructive behavior, suicide is the most dramatic expression of a lost sense of meaning and purpose in life.

This report attempts to provide an overview of the phenomena of suicide among the Inuit in Greenland. The leitmotif is the relationship between the social transition of the Greenlandic society and the high prevalence of suicide since the mid 1970's. The first section provides an update of earlier studies on the epidemiology of suicide, identifying recent trends in the distribution of suicide rates. Epidemiological data on variations in the prevalence of suicide by age, gender, place of residence, and other demographic factors are presented. The second section focuses on the general characteristics of suicides, circumstances and events commonly found among those committing suicide. In the third section the relationship between postwar-modernization and increasing suicide rates since the mid 1970's is discussed. Sociodemographic indicators of suicide are presented and special attention is given to the temporal distribution of regional suicide rates. In addition efforts will be made to identify directions for explaining the increasing number of suicide since the 1970's and possible implications for intervention and prevention are discussed.

2. Historical context

In order to understand mental health problems among indigenous people in Greenland, some knowledge of the historical and cultural background of Greenland is needed. The Greenlandic culture has been undergoing significant changes due to the arrival of Europeans at different periods throughout the history. Without doubt these changes have played a dominant role in the mental health of the indigenous people in Greenland.

From a traditional hunting to a wage-earners society

Today's Greenlanders are descendents from the Inuit of the Thule culture who immigrated from Canada and Alaska from about AD 1000 onwards. The Inuit came across Smith Sound between Ellesmere Island in Northern Canada and the Thule region in Greenland and gradually spread to more eastern and southern regions (Lynge, 1997).

Approximately at the same time as the Inuit arrived in Northern Greenland, the Norse gradually settled in Southwestern Greenland. According to the Icelandic sagas, Eric the Red sailed out to Greenland with 25 heavily loaded ships, of which only 14 ever reached their destination. Many more ships followed and the Norse established two larger settlements, surviving on agriculture, fishing and hunting. There is some evidence of contact between the Norse and the Inuit. Icelandic sagas and Inuit legends report occasional encounters between the two groups. Both peaceful and bloody confrontations are described, but we do not know how intensive the contact between the Inuit and the Norse has been. Meanwhile the Inuit continued to move further south and by the end of the 15th century they passed at Cape Farewell and migrated further up the east cost of Greenland. By this time the Norse had disappeared in Greenland, for reasons that remain unknown, but probably related to climatic changes.

In the 16th and 17th century the contact between Inuit and Europeans has been rather sporadic. Whalers, who had discovered the rich waters of Greenland, reported encounters with the Inuit. These meetings have probably been limited to the exchange of trading goods, and Greenland remained rather isolated during these centuries. The Inuit maintained their traditional culture, based on the hunting of sea mammals on the coast and polar bear in the inland. The economic and social center of traditional Inuit life was the extended family. Small communities consisted of several families who cooperate in hunting and social activities. Sharing between families was necessary to ensure survival in a very harsh and demanding environment.

The colonization of Greenland, starting in the early 18th century, gradually brought changes in the traditional culture. In 1721 the missionary Hans Egede from Norway, which was at that time part of the kingdom of Denmark, established a colony on the west coast of Greenland (later this colony was replaced to Godthåb (Nuuk), now the capital of Greenland). Hans Egede's motive force behind his mission and colonization plans was the hope to find descendents of the Norse and convert them to the 'true (reformed) gospel' (Lynge, 1997). But the Norse had died out by this time and Egede settled among the Inuit. Within the following 70 years other colonies on the west coast were established and by the end of the century most of the Inuit in this region were baptized, and Denmark had established sovereignty over Greenland. Trading was established, and the Inuit's culture was influenced through the consumer goods bartered to them (Gad, 1985). As a result the Inuit became partly dependent on outside supplies and lost some of their independence. Other parts of Greenland were colonized much later. Eastern Greenland was not colonized before the end of the 19th century, and North Greenland not before the beginning of the 20th century.

In Greenland, World war II marked the transition from a traditional hunting society to a modern wage earners society. The Americans built several airbases in Greenland, as the country was of strategic importance throughout the postwar period. The contact between the American airbases and the Inuit was limited, but the century long isolation of Greenland was broken (Bjerregaard & Young, 1998). After the war Denmark made efforts to establish a modern welfare society in Greenland. These efforts led to the formulation of the G-50 report. This report prompted the passage of eight laws on the field of administration, public treasuries, church, schools, health services, trade and justice (Gad, 1985). The report suggested the development of a marked for wage labor by establishing a commercial fishing industry. Centralization of the population, by moving people from small settlement to larger towns, and the development of infrastructure brought further changes in the economic, social and cultural domains of Inuit life (Bjerregaard & Young, 1998). These social and cultural changes were paralleled by political ones. In 1953 Greenland had become an integrated part of the Kingdom of Denmark and a proposal for a home rule constitution was accepted by a referendum in 1978. In the following year home role was established, giving political independence to the Greenlanders. However, Greenland remained economically dependent on large grants from the Danish state. Its weak economy still can not supply the material needs.

Today, Greenland is confronted with a series of economic, social and public health problems. Without doubt, modernization brought positive outcomes for the Inuit as

well. The housing standard and medical and social services have been improved and new possibilities for the individual and hope for the future has been created. But the postwar years also accelerated the spread and use of alcohol and, most dramatically, the number of suicides.

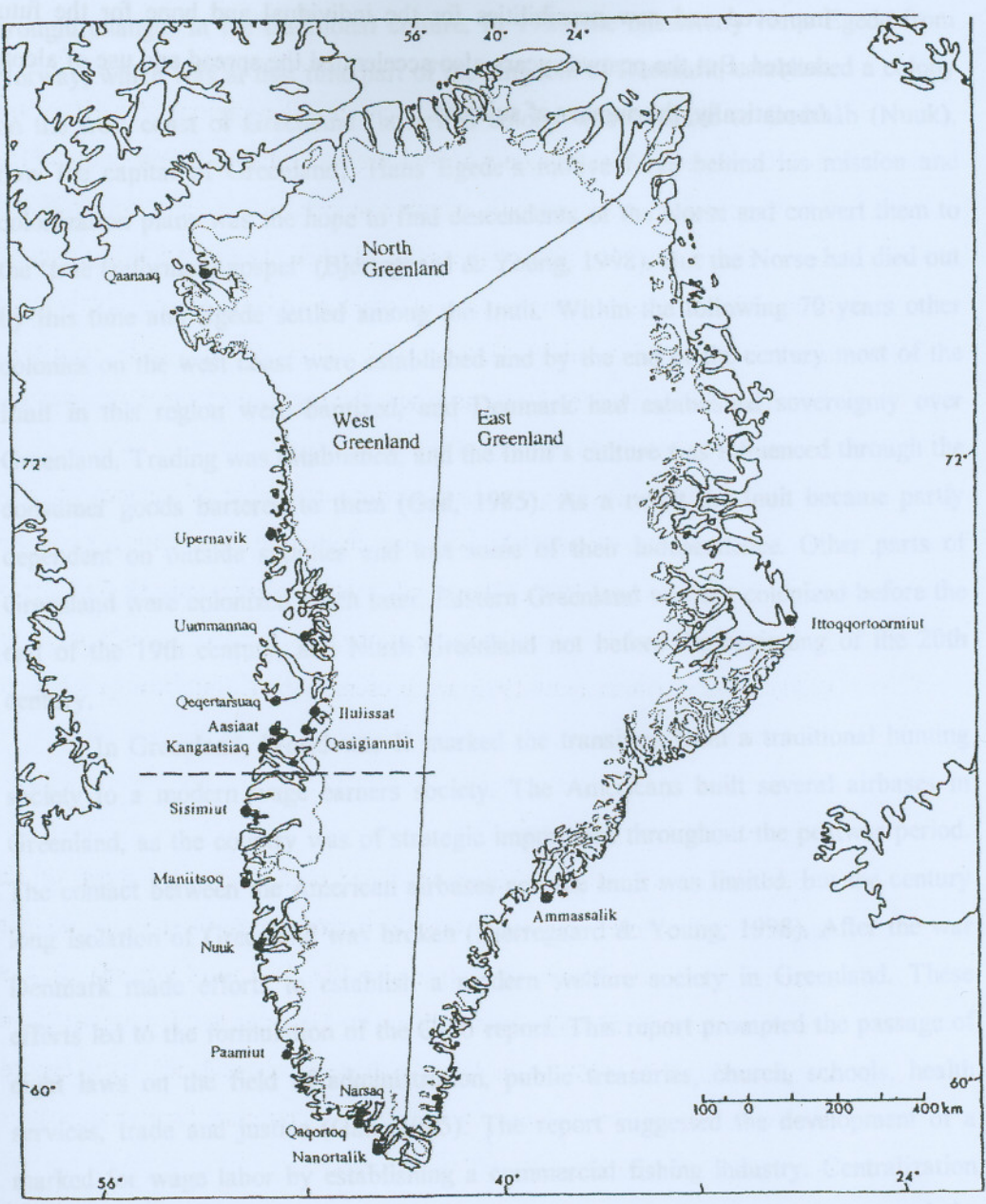

Fig 1: Map of Greenland with towns and regions. The broken line divides West Greenland into a northern and a southern part. (Source: Lynge, 1997, p.4).

3. Epidemiology of Suicide

Before the second half of the 20th century suicide was not a common phenomenon among Inuit in Greenland and other circumpolar regions. However, from different sources we know that suicide was in a way accepted among traditional Inuit societies. The most predominant reason to commit suicide was when a person became a burden to the community, because of illness or old age. The decision to commit suicide was taken after extensive consultation of other members of the family and they might assist in committing suicide (Lynge 1997). However, this traditional form of suicide was probably limited to situations where the survival of the group was endangered by the infirmity of a single member of the community.

This pattern sharply contrasts with the number of suicides since the early 70s. During the last 25 years Greenland has been confronted with a dramatic increase in suicide rates (Lynge, 1985; Thorslund, 1990; Bjerregaard, 1997). The focus of this section is to provide an update of nationwide trends of suicide rates in Greenland. Epidemiological data until 1995 are presented, including demographic characteristics associated with suicide.

Demography

Greenland is the largest island of the world. However, most of the inland is permanently covered by ice. Only a narrow coastal strip is inhabited and the population of Greenland is small (see also Fig. 1: map of Greenland). Currently there are no more than 56.000 persons living in Greenland. Of these, 89% were ‘born in Greenland’, while 11% were ‘born outside of Greenland’ (Bjerregaard & Young, 1998). In this study the place of birth is used as estimate for ethnicity. Persons ‘born in Greenland’ are regarded as ‘Inuit’ or ‘Natives’

Since the beginning of the century the population grew from 11,800 in 1901 to 55,700 inhabitants in 1995. Especially in the 60’s and 70’s there was a steep increase of the population, also due to the increasing influx of Danes. Greenland is divided into 16 geographically well defined districts. Districts include one small town, with public administration, a hospital and travel facilities to other districts, and a number of smaller settlements. About 91% of the total population live on the west coast of Greenland, while East Greenland and North Greenland account for 7% and 2% respectively. Nuuk, the capital of Greenland, is the largest town, with roughly 13,000 inhabitants, more than 20% of the total population. Approximately 60% of the Inuit population live in 16 other small towns, and the remaining 20% live in 60 villages.

Register of causes of death

In order to calculate nationwide suicide rates, data were drawn from a computerized register on causes of death. The register includes information on all deaths of persons domiciled in Greenland at the time of death. The register is based on death certificates, parish registers and/or the civil registration records for the Greenlandic population. Initially the register has been established for the period 1968-83, now an update of the register is available for the period 1968-1995. Persons born outside of Greenland were excluded from the dataset. Epidemiological data on the population born in Greenland were drawn from the register to identify demographic characteristics of persons committing suicide and to describe regional and temporal trends of suicide rates. Data on causes of death based on ICD-codes and data on demographic variables, e.g., sex, age and place of residence, were obtained from the register.

To calculate suicide rates per 100,000 population, data on the population born in Greenland for the period 1972-1995 were drawn from statistical yearbooks (published annually by Statistics Greenland). The relative age distribution of the Greenlandic population varies significantly within the described period and between different regions in Greenland. Suicide rates have been age-standardized by direct standardization (standard population: native population) according to Rothman (1986), when comparing different time periods or different regions in Greenland.

The register may not include all cases of suicides. Thorslund and Misfeldt (1989) investigated the reliability of suicide rates for the years 1977-86, and concluded that the official statistics seem to cover almost all cases of suicide. In Greenland, the number of accidents and unidentified causes of death is relatively high, and it is difficult to determine how many accidents actually are suicides.

Prevalence of Suicide since 1972

To begin with, suicide rates for the population born in Greenland have been calculated. Figure 2 shows the suicide rates for the period 1972-1995 in Greenland and North European countries, as Denmark, Finland and Sweden. For Greenland age-standardized suicide rates have been calculated according to Rothman (1986) (standard population: native population in the period 1972-1995). The Figure shows the dramatic increase of suicide rates in Greenland in the 70s and 80s. Whereas in the early 70s rates were below 50 per 100,000 population in the late 80's rates above 100 per 100,000 population were found. In the period 1984-1989 the rates reached a maximum, with annual peak rates per 100,000 between 109-140. Looking at suicide rates in other North European countries, there is a fivefold difference. In the period 1990-1995 suicide rates declined. Although it is too early to speak of a continuous

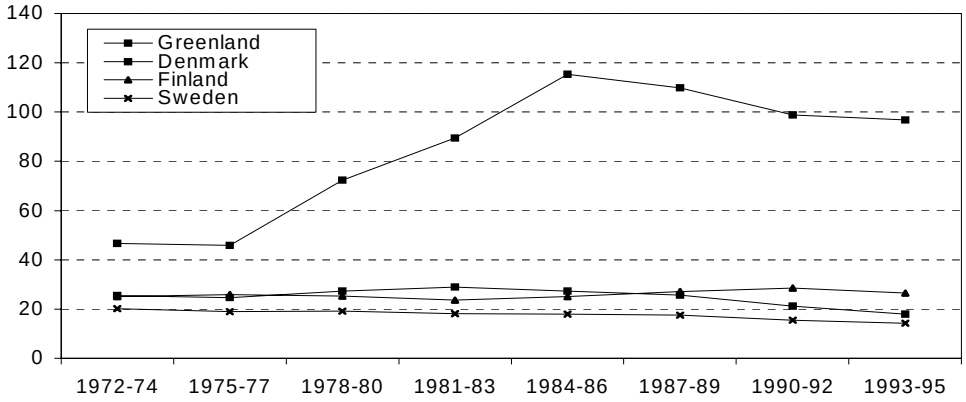

Fig. 2: Suicide rates per 100.000 population over the years 1972-1995 by three year periods for the total Greenland-born, Danish, Finnish and Swedish population. Source: death register and OECD Health data 98.

downward trend, it appears that the suicide rates stabilized. However the rates remained very high (ca. 100 per 100,000), when compared with rates in other North European countries.

Demographic characteristics: 1990-1995

For the period 1990-1995 demographic characteristics of those committing suicide were identified, to describe more closely 'who' commits suicide. Figure 3 shows suicide rates per 100,000 specified by sex and age, for this period. The rates show remarkable differences between men and women, especially in the age group 15-24. In 5 out of 6 cases suicides were committed by men. Whereas in most Western countries suicide rates increase with age, in Greenland they were extremely high among young men aged 15-24 (around 460 per 100,000). The rates declined with age, while they continued to be higher among men than women.

Figure 4 shows suicide rates per 100,000 for different age groups in the period 1975-1995. In the 70s and 80s suicide rates increased in all age groups. The highest

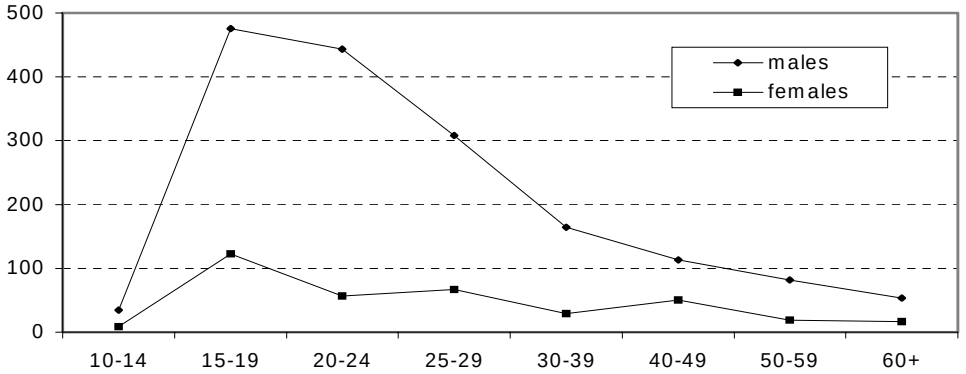

Fig. 3: Suicide rates per 100.000 population by age and sex in Greenland in the period 1990-95, (N=285)

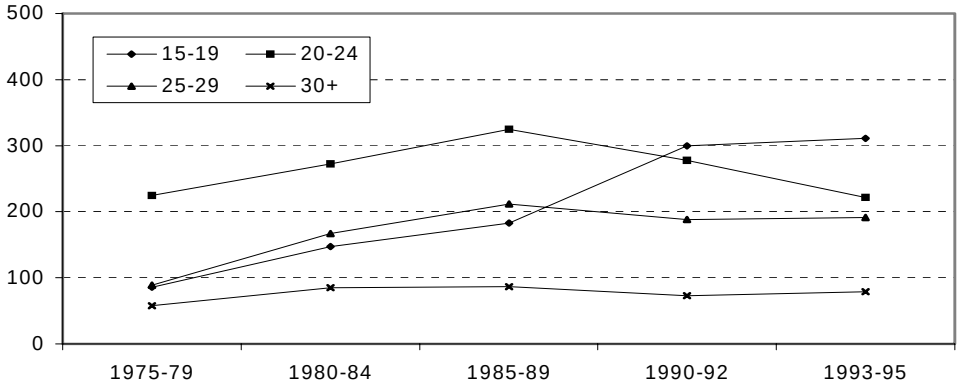

Fig. 4: Suicide rates per 100,000 population by age groups over the years 1975-95

rates were found in the age group 20-24 and the lowest rates were found among those aged 30 and above. In the period 1990-1995 the rates decreased in the age group 20-24, whereas a remarkable increase was found in the age group 15-19. From 1990 the highest rates were among those aged 15-19, which is 300 per 100,000 population.

Figure 5 shows age-standardized suicide rates (standard population: native population in the period 1980-1995) specified by regions for the periods 1980-89 and 1990-95, with North Greenland excluded because of its very small population (average annual population in 1990-95: 787 native inhabitants) and consequently uncertain suicide rates. Suicide rates were high all over Greenland, but especially in East Greenland they were extremely high. Rates were dramatically high in eastern towns, and since 1990 very high rates were found in the eastern settlements too. In the capital of Nuuk, suicide rates declined considerably compared to the rates in 80's. In the period 1990-1995 the rate was 76 per 100,000 compared to 149 per 100,000 in 1980-1989. In West Greenland suicide rates were higher in towns in the northern part of West Greenland than in towns in the south. In all regions suicide rates were higher in towns than in settlements. However, the Figure shows a general trend of increasing

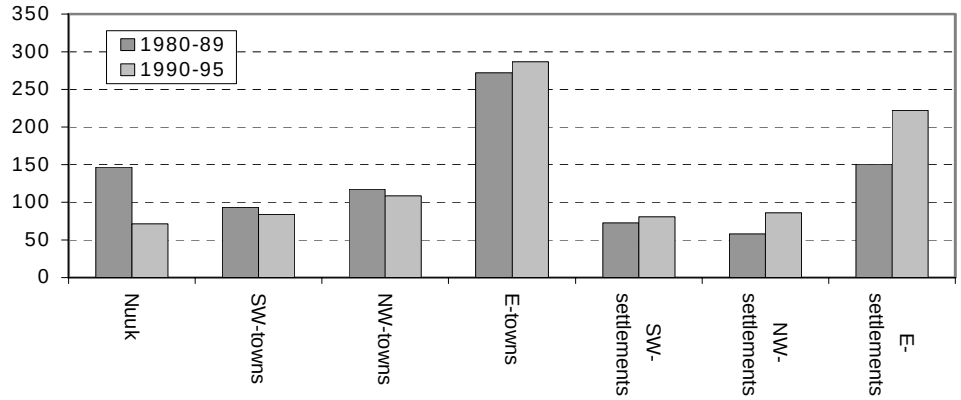

Fig. 5: Suicide rates per 100,000 population distributed by regions in 1980-89 and 1990-95.

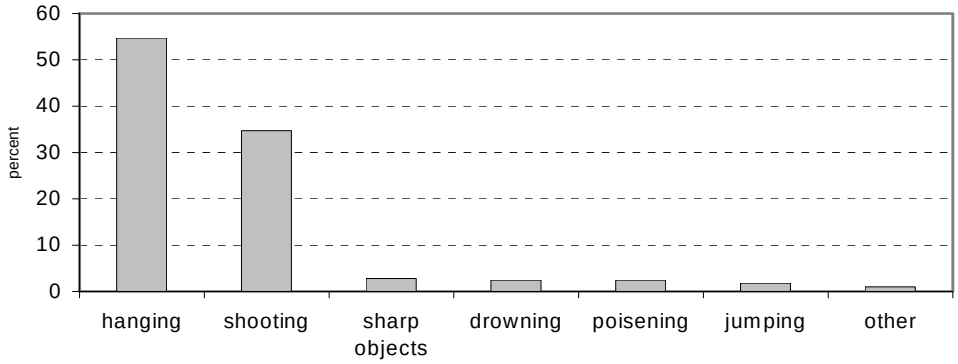

Fig. 6: Methods used by persons committing suicide in Greenland in the period 1990-95

rates in settlements and decreasing rates in towns.

The distribution of suicides specified by method of suicide is shown in Figure 6. In more than half of the cases suicides were committed by hanging (56%). Shooting was used by one third (33%). Hanging and shooting were the method most often chosen by both men and women, respectively 53% and 38% for men and 65% and 17% for women (not shown in the figure). Other methods, such as overdose of medication, jumping from high places, drowning and the use of cutting and piercing instruments were less frequently used.

A widespread view formerly held is that suicide rates in Greenland and other circumpolar regions are higher in winter, which is a period characterized by the absence or low level of direct sunlight. However, nonparametric analyses of the frequency distribution of suicides across months (null-hypothesis: all frequencies being equal) did not reflect any significant temporal variation in the period 1987-1995 (χ^2=13.76, p=0.246; N=449).

Other circumpolar regions

It has already been stated that other circumpolar regions have experienced similar increasing numbers of suicide. In the 1970s and 1980s increasing suicide rates have been found among indigenous communities in Alaska and Northern Canada. Comparing reported suicide rates from different circumpolar regions is problematic, as rates are calculated by different methodologies, time periods and sample characteristics. Table 1 summarizes published reports on suicide rates among indigenous communities in Alaska and Canada. All reports indicate higher suicide rates among indigenous groups compared to the general population in Canada or the U.S. In general the pattern of the prevalence of suicides is comparable to that in Greenland. Suicide rates increased in the 1970s and 1980s. Especially among those aged 15-25 suicide rates are dramatically high. Hanging and shooting are the methods

most often used. However, suicide rates are higher in Greenland than in most other circumpolar regions.

Table 1: Reported suicide rates among Canadian indigenous groups and Alaska Natives (Source: Kirmayer, 1994 (updated))

Region	**Group**	**Period**	**Source**	**Rate per 100,000**
Labrador	'Native Peoples' Age 15-24	1979-83	Wotton, cited in Aldridge & st. John, 1991	337
Labrador North Coast	Innu & Inuit, Age 10-19	1977-88	Aldrige & St. John, 1991	180
East Coast of Hudson's Bay	Inuit	1982-91	Kirmayer et al, 1994	55-86
Northwestern Ontario	Oijibwa	1975-82	Spaulding, 1986	62
Manitoba	Northern Manitoba, Status Indians	1981-84	Ross & Davis, 1986	77
	Natives, Age 18-20	1971-82	Thompson, 1987	177 M+ 32 F+
Alberta	Northern Alberta Natives, Age 15-34	1980-85	Bagley et al., 1990	89 M
British Colombia	'All Aboriginals'	1984-89	Cooper et al., 1992	24
N.W.T.	Total Population, Age 15-24	1978-80	Rodgers, 1982	120 M 40 F
	Inuit, age 15-24	1980-89	Bjerregaard & Young, 1998	118
Alaska Natives	Age 15-24	1979-84	Kettle & Bixler, 1991	84 M 18 F
	Age 14-19	1979-93	Gessner, 1997	120 M 31 F
	All ages	1983-84	Hlady & Middaugh, 1987	74 M 13 F
	Age 15-24	1980-89	Bjerregaard & Young, 1998	118

+ M = males; F = females

Summary of Epidemiology

In sum, suicide is a persistent health problem in Greenland. Suicide rates have increased dramatically in recent decades to more than the fivefold of rates in North European countries. In the first half of the 1990s suicide rates appear to have stabilized, though rates remain extremely high. The future has to show whether there is a real change in the trend of suicide rates. Suicide continued to occur much more frequently among the young people. Recent years showed a decrease of suicide rates among those aged 20-24, whereas suicides rates increased among those aged 15-19. Apparently suicide has become a problem among an even younger population.

In a European multicenter study suicide rates were compared to attempted suicide rates among males and females in the age group 15-24 over the period 1989-1992 (Hawton, Arensman, Hultén, Wasserman, Bille-Brahe, Bjerke et al., 1998). From the 13 participating countries, the highest suicide rate for males aged 15-24 was 45 per 100,000 in Helsinki (Finland). Looking at the average suicide rate for males in this age group in Greenland (ca. 460 per 100,000). This is a tenfold difference. Hawton et al. (1998) also found a strong correlation between the rates of attempted and fatal suicide among males aged 15-24. Whether this is true for the young males in Greenland is difficult to verify, since there are no reliable data on non-fatal suicidal behavior.

Suicide rates show wide regional variation. The highest suicide rates were found in towns and settlements in East Greenland. Suicides rates were higher in towns in the Northern part of West Greenland compared to towns in the Southern part. The capital of Nuuk experienced a sharp decrease in suicide rates compared to rates in the 1980's.

The nationwide trends of suicide rates in Greenland presented in this section provide us with a first impression on how dramatic the problem of high suicide rates in Greenland is. In the following section a more detailed description of those committing suicide will be given, to explore more closely the characteristics and circumstances of suicides in Greenland. The main focus of the section is to describe the social and psychological background of suicides.

4. Suicide characteristics

Health professionals seeking ways to break through the pattern of high numbers of suicide have often been hindered by the lack of information available on the individual cases of suicide. Few victims were known to the health authorities as mentally ill or sought help for emotional problems prior to committing suicide (Lynge, 1985).

The fact that the motives to commit suicide often remain obscure may be partly due to the taboo-like silence surrounding suicide. In recent years health organizations have made efforts to overcome this silence. A national program has started concentrating on how family members and friends can support a person expressing suicidal thoughts. Information material has been distributed among health centers and schools and attention has been called for through radio and TV.

However, to develop prevention programs, information on the psychological background of suicides is urgently needed. This section focuses on suicide characteristics - those circumstances and events commonly found among persons committing suicide. 'Who' commits suicide and what are the problems that play a role in 'why' so many people put an end to their lives?

Prior research

A number of studies has been conducted addressing the psychological background of suicidal behavior in Greenland. In a controlled study among suicide attempters in the capital of Nuuk, Grove and Lynge (1979) found that a high proportion of suicidal attempters had parental homes or foster homes with an atmosphere of disharmony and alcohol abuse. Suicide attempters experienced problems at various areas, as alcohol, criminality, frequent crisis and conflicts.

Concerning completed cases of suicide, it appears that in many cases suicide is preceded by a broken, conflict-ridden or violent relationship with the partner. In some cases the person committing suicide placed an unrealistically high value on the relationship and rejection by the partner resulted in feelings of hopelessness and loneliness, being the motive force to commit suicide (Lynge, 1985). Suicide is often committed under the influence of alcohol and occurs more frequently among the unemployed and those with a traditional occupation (Thorslund, 1990)

In a more recent study on suicidal ideation Bjerregaard and Young (1998) report that the most important determinants of suicidal thoughts were the occurrence of alcohol problems in the parental home and the experience of sexual abuse during childhood. Furthermore, those who had experienced a suicide among relatives or friends reported suicidal thoughts more frequently (Bjerregaard, personal

communication, July 1999).

Sources of information

In this study it was chosen to analyze existing material on suicides, available in the form of death certificates and police reports, in the hope to be able to gain some kind of information on the psychological background of suicides. By law every case of suicide or unnatural death should be jointly examined by the district medical officer and the police. The place of finding is investigated and witnesses and relatives are interviewed by the police (Thorslund, 1989). The information given in the death certificates and police reports may help in understanding the motives of the individuals committing suicide.

For this purpose, death certificates identifying suicide as cause of death were selected and reviewed for the period 1987-1995 (N=408). Data on the medical examination and supplementary information was retrieved from the certificates. In general, supplementary information given on the death certificates increased over the years. Apparently medical officers got more aware of the problems related to suicide. Police reports were reviewed for corresponding cases for the period 1993-1995 (N=139). The data drawn from the death certificates and police reports was summarized for the period 1993-95.

The extent of information given in the death certificates and police reports varied considerably between cases. Whereas some of the files included an extensive description of suicides, based on medical examination and the testimony of eye-witnesses, other files sustained with very little or no information on events related to suicide. In 29 of the 139 cases the files contained no or very limited background information on the circumstances of suicides. Only those files giving at least a minimum of information were included in the analysis (N=110).

Suicides characteristics

The circumstances that led to suicide, as described in the death certificates and police reports, differed greatly among cases. Although every suicide has its personal story and the motives often remained obscure, the examination of the files indicates some general trends among suicides, shown in Table 2.

In 7 cases (6,4%) the death certificate or police report mentioned that the person committing suicide had previously attempted suicide. In almost half of the cases the intention to commit suicide was announced in one way or another prior to the act. Considering these numbers, it appears that in at least half of the cases those committing suicide had given expression of their suicidal intentions. In some of these

Table 2: Summary of suicide characteristics derived from death certificates, police reports and register of causes of death on suicides in the period 1993-1995 (N=110); each person may have several diagnoses.

	Number of cases	Percentage
Suicide		
Talked about suicide	48	43,6
Attempted suicide	7	6,4
Experienced suicide	8	7,3
Relationship (total)	(55)	(50,0)
Problems with partner	38	35,5
(Left by partner)	(15)	(13,6)
Problems with parents or family	20	18,2
Problems with friends or within the community	6	5,5
Adjustment problems due to stressful life-event *	14	12,7
Mental health problems (total)	(28)	(25,5)
Psychosis, unspecified	7	6,4
Substance abuse		
Alcohol	7	6,4
Cannabis	1	0,9
Depression, unspecified	9	8,2
Personality disorder, unspecified	4	3,6
Acute alcohol intoxication	33	30,0

** severe health problem, (6); financial problems, (2); problems at work, (2); imprisonment, (1); death of parent (s), (2); confrontation with own sexual abuse of child, (1))*

cases relatives and friends feared to interfere with the situation or did not know how to withhold the person from committing suicide.

In 8 cases (7,3%) those committing suicide had previously experienced a suicide among relatives or friends. In some of these cases it was mentioned that the person committing suicide may have been inspired by the suicide of others and one

case described two adolescent boys who made a ‘contract like’ agreement to commit suicide together.

In a relative high number of cases the death certificate or police report mentioned problems in the relationship with the partner, relatives or friends. In 36 cases (35%) a conflict-ridden relationship with the partner was identified as a possible motive of suicide. In almost half of these cases the person committing suicide was left by the partner previous to the act. Conflicts with parents were mentioned in 20 suicides (19%) and in 6 suicides (6%) an argument or fight with another member of the community was reported. All in all, in half of the cases the death certificate or police report mentioned a conflict-ridden or disturbed relationship as a possible motive of suicide.

In 14 suicides (12,7%) adjustment problems due to a stressful life-event were identified as a possible motive of suicide. Stressful life events varied from severe health problems to financial problems, loss of work, death of a parent or imprisonment. In one case a father committed suicide after receiving a letter from his daughter, in which she accused him of sexual abuse during her childhood. Some of these cases mentioned a pronounced grief reaction preceding suicide.

In about 25% of the suicides, an indication of mental health problems was identified on the death certificate. This included 9 cases of unspecified depression, 7 cases of unspecified psychosis, 8 cases of substance abuse (including 7 cases of alcohol abuse and 1 case of cannabis abuse) and in 4 cases a disturbed personality was diagnosed by the local medical officer.

Next to the pathological abuse of alcohol, alcohol has an important role as a possible facilitator of suicidal behavior. In 33 suicides (32%) acute alcohol intoxication was reported on the death certificate or police report. The widespread use of alcohol in combination with the availability of firearms may very well contribute to suicides.

A typical description of a suicide according to the death certificate and police report can be illustrated by the following case:

The deceased was a 19 year old boy. Prior to committing suicide he had frequently talked about suicide, though he didn’t seek help for emotional problems. Prior to committing suicide his girlfriend had ended the relationship and told him that she wouldn’t go back into the relationship. Medical examination indicated that he had 2.05 alcohol in his blood when committing suicide. The evening of his death, he had been drunk at a party, where he had a fight with his girlfriend. Later that evening he went home and shot himself with a rifle. (Source: death certificates and police reports)

Table 3: Suicide specified by occupation, with the number of suicides and crude raes in teh period 1987-1995; native population 18 years and above.

	Male			Female		
	Number	**Estimated number of person-years**	**Crude rate***	**Number**	**Estimated number of person-years**	**Crude rate***
Fisherman/hunter	64	25671	263-333	-	-	-
White collar (high)	4	18690	16-36	4	19641	17-39
White colar (low)	24	16213	150-204	9	27140	22-58
Skilled worker	21	10584	206-268	-	1071	-
Unskilled worker	58	19366	320-396	17	33211	53-87
Unemployed	70	15988	477-569	9	15177	63-99
Housekeeper	-	1801	-	7	12677	58-92
Retired	15	19141	75-113	1	18212	2-13
Student	24	5404	485-577	6	6249	107-153
Missing	56			19		
Total	336	143893	234	72	138913	52

** crude rates are multiplied by (336/(336-56)) for males and (72/(72-19)) for females to correct for missing values. Intervals show the 95% confidence interval calculated by ±2 x √rate, for Poisson distributions.*

Employment

Information on the occupation of those committing suicide has been drawn from the death certificates and police reports for the period 1987-95 (N=336). No nationwide registration of occupation is available for the Greenlandic population later than 1976. In order to calculate suicide rates by 100,000 population employment data on the total population has been estimated by data from the 1993-94 Greenland Health Interview Survey, conducted by Bjerregaard and Young (1998).

Table 3 shows suicide rates per 100,000 population specified by sex for different occupation groups. Among males the highest rates were found among the unemployed, students and those with a traditional occupation. Among females the highest rates were found among students. For both sexes white-colored occupations and those retired had the lowest rates. Due to relatively small numbers of suicides within occupation-groups, no age-standardized rates could be calculated. The

relatively high rates among students and low rates among those retired correspond with the fact that suicide occurs more frequently among the age group 15-25 and less frequently among older age groups.

Discussion

The death certificates and police reports revealed a general picture of dysfunctional social relationships and feelings of alienation among persons committing suicide. In half of the cases a conflict-ridden or disrupted relationship was mentioned on the death certificate or police report, being the most prevailing motive to commit suicide. The lack of stable social networks seems to play a significant role among suicides in Greenland. The individual's quality of social networks may also influence suicides indirectly through the individual's capability of dealing with stressful life-events. In a number of cases a stressful life-event followed by a pronounced grief reaction was mentioned among suicides. Those missing supportive relationships may be at higher risk when experiencing a stressful life-event. This may be further indicated by the fact that in almost half of the cases those committing suicide had announced their intention to commit suicide previous to the act. In many cases the individual's social bounds were not strong enough to withhold those expressing suicidal motivations from committing suicide. Dislocation of community and family restraints seem to increase the vulnerability of young people, faced with rejection or loss of a significant relationship. Moreover, inspiration to suicide by others poses a special problem for Native communities as a suicide affects nearly everyone in the community. Where the individual can find examples from the direct environment, suicide may be an easier solution to the problems faced (Lynge, 1980).

The data on death certificates and police reports have not systematically been recorded and no comparable data exist for the general population. This makes a comparison with non-aboriginal populations problematic. Studies among western population have indicated that the quality of the individual's social network and the availability of potentially supportive relationships have an important role in suicidal behavior (Grossi & Violato, 1992; Heikinen & Loennnqvist, 1995). There is considerable agreement that suicide attempts often take place in the context of a recent and serious interpersonal conflict, including the breakup of significant relationships and the loss of personal resources (Weissman, 1974). Especially among young people the lack of social support, rejection by the partner and academic or vocational failure are commonly found predictors of suicidal behavior (Heikinen & Loennnqvist, 1995; Hawton, 1986). A study of suicide attempts among Inuit youth living in a community in Northern Québec found that suicide attempters were more likely to report a

personal or mental health problem in the previous year and to feel alienated from the community and their family (Kirmayer, Malus & Boothroyd, 1996). Among seven victims of a suicide cluster in a Cree community low self-esteem, lack of intimate relationships, social isolation and identity confusion were evident in all cases (Ward & Fox, 1977). Among suicides in Greenland, mental health problems were mentioned in 25% of the suicides. In non-aboriginal populations depression is the most common diagnosis of suicidal behavior (Rihmer, 1997). However, death certificates and police reports mentioned depression in only 8,2% of the cases as a possible motive to suicide. This may indicate a real difference compared to non-aboriginal populations or be a result of underreporting of depressive disorders by local health professionals.

In sum, dysfunctional and disturbed social networks are the most striking characteristic of suicides in Greenland. More information on the psychological processes underlying suicidal behavior and the risk factors that play an important role on the individual level is needed. In order to develop effective interventions to prevent people from committing suicide or repeating non-fatal suicidal behavior, future research should focus more on the motives of a person engaging in suicidal behavior and the role of dysfunctional social networks in suicides.

After this description of general trends and characteristics of suicides, the following section will focus on the relationship between recent socio-cultural changes resulting from the modernization of Greenland and the increasing suicide rates since the mid 1970's. Empirical data are presented on possible demographic and economic indicators of suicide and the regional variation of suicide rates.

Final remark

The death certificates and police reports provided only limited and possibly biased information on suicides. This is partly due to the fact that the files don't give special attention to the psychological and/or social background of deaths. Especially in the case of suicide, but also in the case of accidents and homicides, this kind of information would be very valuable. A new look at the structure of death certificates and police reports may be necessary. Eventually, an extra form should be developed, to be filled in by the local medical officer and the police, addressing suicides from a more psychological or social perspective.

5. Modernization and mental health

While mental health professionals tend to view suicide as an individual problem related to personal and family pathology, the etiology of suicides may be as much related to large scale processes in the society (Bradford & Gessner, 1997). Every suicide is at once profoundly personal and at the same time strongly influenced by social and cultural forces (Lynge, 1997). Concerning the recent increase of suicide rates in Greenland, there is general agreement on the assumption that the high suicide rates in Greenland since the mid 1970's are related in one way or an other to the process of modernization (Bjerregaard & Young, 1998; Lynge, 1985; Lynge, 1994; Olsen, 1985).

The idea that the prevalence of suicide in a society is related to large scale processes has been put forward by the French sociologist Emil Durkheim (1951). Durkheim's study on suicide meant a breakthrough in studying suicide from a societal perspective, rather than in terms of purely clinical pathology (Makinen, 1997). According to Durkheim the society plays a part in the prevalence of suicide. He argued that the degree of social integration and regulation within a society are the twin social causes of suicide. In the tradition of Durkheim, a number of studies have selected several indicators of social integration and regulation, such as divorce rates, unemployment and demographic characteristics within a population, and have found linear relations between indicators and suicide rates (Stack, 1982; Lester, Curran & Young, 1991; Lester, 1988).

It is the rapid and profound societal changes that give the most tangible explanation of the recent 'explosion' of suicide rates, substance abuse and domestic violence in Greenland (Bjerregaard & Young, 1998). Rapid changes occurred in the economic and demographic, but also in the social and cultural dimensions of the society and for many people modernization was an experience of loss. While physical conditions in the communities have improved in recent decades, modernization has resulted in a breakdown of the traditional cultural and social Inuit life and the development of mental health problems.

This section focuses on the relationship between profound social and cultural changes due to the modernization of Greenland and the high suicide rates since the mid 1970's. To begin with a number of important changes due to the modernization of Greenland are described.

Modernization of Greenland

In an earlier section of this report some major turning points in the history of

Greenland have already been outlined. Greenland was in effect closed until World War II, closed in the sense that the traditional hunting culture was not disturbed to a great extent. However, like in other parts of the world, the values of modern high technology have forced themselves on the traditional way of life, and the postwar years may be characterized as a period of adaptation to Danish cultural institutions and consumer goods (Stenbaek, 1987).

After the formal political integration of Greenland in 1953, the Danish government realized that as Greenland had become part of a welfare state the standard of living had to be raised to an acceptable level. Based on the assumption that this could be achieved only by the development of a new economy, efforts were made to establish large scale fishing and fish processing industry (Kleiven, 1969). As a consequence, a mixed economy of fishing and hunting emerged. The replacement of a subsistence economy, based upon the variations of the seasons, by a day to day based mixed economy, resulted in major changes in the lifestyle of the Inuit. New technologies were applied. From a mainly self-supportive community, the Greenlandic society has now become predominantly dependent on financial support from abroad. The material progress and the shift toward a money-economy created further expectations among the population and prepared Greenland to open up to the modern world (Stenbaek, 1987).

The economic changes have gone along with centralization of the population from smaller settlements to larger communities. Initially, this resulted in a poorer standard of living, which together with the appearance of new infectious diseases, like tuberculosis and other viruses, resulted in a general decline of health conditions (Olsen, 1985). However, throughout the progress of the modernization everyday life and physical conditions improved obviously, as reflected in the vastly improved housing conditions, a stable supply of food and western goods, and decreased mortality and morbidity from infectious diseases (Bjerregaard & Young, 1998).

One of the effects of political and economic changes, particularly centralization, has been a new role for Inuit men and women in the communities. Centralization has often led to unemployment, disorientation and despair especially among Inuit men. They directly suffered from the loss of pride from the destruction of the hunting traditions, since the possibility to display masculinity in the old, culturally defined ways was lost (Samapath, 1976). It is assumed that women were able to adopt more easily to the transition of the society in their domestic role at home and inside the family. At the same time women adopted to higher education and became teachers and social workers. As a consequence the traditional family structures changed, in the sense that men were no longer the only to care for the family's material needs

(Stenbaek, 1987).

Apart from changes in family structures, the centralization of the population led to changes in education and upbringing of children. In the traditional society the social relationships were imbedded into the community with the family as the backbone (Olsen, 1985). Boys were expected to be good hunters and girls were raised towards domestic roles. In recent decades social institutions, like schools and kindergartens, have partly replaced the family with respect to education and rearing of children. Today, the youth is confronted with ambiguous social norms and values. They cannot identify with the traditional lifestyle because of the lack of knowledge of - or interest in - the traditional skills, nor are there ready-made social roles. The Youth is seeking alternative lifestyles, which has resulted into a gap between generations (Seltzer, 1980). Feelings of alienation and lack of belonging may be the consequence and create frustration among the Inuit youth. Moreover in the 1950's and 1960's an increasing number of Danes, mainly males, settled among Inuit communities and have taken over most of the well paid and influential jobs, creating further frustration among the population.

Mental health consequences

Rapid socio-cultural change seems to be the most obvious explanation for the increased number of suicide since the mid 1970's. A number of researches have been interested in the consequences of modernization, also referred to as *urbanization*, *assimilation*, *acculturation* or *westernization*, on mental health among traditional societies.

Throughout the discussion of the consequences of socio-cultural change on mental health different positions have been proposed. Sorokin (1941), for example, stated that one direct consequence of rapid culture change is an increase in mental health problems. Mead and Slotkin argued that disorganization of the society and pathological tensions are often a reaction on technological developments, that go along with the progress of modernization (In: Barger, 1977). Others have argued that no direct relationship exists between modernization and maladjustment (Inkeles & Smith, 1974).

It has long been a common view that modernization necessarily has a negative impact on the mental health status of indigenous people. However, such a broad and general claim is no longer supported, and it is now generally assumed that indigenous groups adapt to socio-cultural change in a variety of ways (Berry, 1997). Among the communities in Greenland some adapted well to the new situations, whereas others experienced an overall decline in economy and public health. This is also true for

individuals who were confronted with dramatic changes in their daily life. Whereas some individuals were able to deal with the problems faced, others escaped in the consumption of alcohol or committed suicide.

Whether the general health status of the Inuit has improved or declined as a result of postwar-modernization depends on whether one chooses to emphasize the positive or the negative outcomes of the recent societal changes (Bjerregaard & Young, 1998). The physical conditions have improved among the communities, but this was probably at the human cost of the population, with a lower mental and social health status. However, a study by Bjerregaard and Young (1998) reports the remarkable fact that a large percentage of the elders in Greenland consider the societal changes during their lifetime to be good. This is remarkable considering the high rates of alcohol abuse, violence and suicide over this period.

Demographic and economic correlates

In an earlier section of this report it has already been stated that suicide rates show wide regional variation. Suicide rates are high in all regions of Greenland, but especially in Eastern regions suicide rates are dramatically high, while in West Greenland suicide rates vary considerably between districts.

In order to describe regional mortality patterns more closely, Bjerregaard (1990) conducted a study on demographic and economic correlates to mortality rates averaged over the period 1970-82. He examined whether regional differences in suicide rates and rates of a number of other causes of death corresponded with demographic and economic indicators in 20 different locations. Demographic and economic indicators included: population change from 1970-1982, community size during 1970-82 and the average yearly taxable income per person in 1979-80 in the 20 locations. The study revealed a positive correlation between population change and mortality from suicide and an additional positive correlation appeared between community size and mortality from suicide when calculating correlations for West Greenland only. According to Bjerregaard there is considerable reason to analyze correlation for West-Greenland only, as East- and North-Greenland present living conditions (and suicide rates) that are quite different. Bjerregaard concludes that the results may be explained by an association between suicides and social instability and/or urban life style.

In this study an update of the study conducted by Bjerregaard has been performed for the period 1980-95, about ten years later than the study by Bjerregaard. Age-standardized suicide rates for the native population, and data on demographic variables were calculated for the same indicators and locations used by Bjerregaard.

Data on income were calculated for municipalities, as data on the average yearly taxable income per person were not available specified by towns and settlements within the municipalities. An analysis of the data revealed that non of the indicators correlated significantly with suicide. In contrast to Bjerregaard's findings no significant correlation between suicide rates and population change and/or community size has been found (population change: R(S)=0.04, p=0.88; community size: R(S)=0.21, p=0.37 (all regions)). Income did not significantly correlate with suicide rates (R(S)=-0.20, p=0.43) (see Appendix for a description of method, material and correlations for West Greenland only). This brings us to the conclusion that demographic variables are no stable (linear) indicators of suicide. Apparently the regional pattern of suicide mortality has changed over the past ten years with respect to demographic characteristics of the communities. While in the period 1979-82 suicide rates were higher among large settlements and settlements with an increasing population, such a general pattern can no longer be found. This is confirmed by the data presented in section 3. It was shown that in recent years suicide rates have increased among settlements and decreased among towns.

Remark on the data:

The small population of Greenland limits the accurateness of the description of the regional and temporal distribution of suicide rates. Considering the small population of Inuit and the limited number of locations that can be specified, most analyses are based on small and uncertain numbers. Furthermore information on explanatory variables e.g., income, employment and education, are notoriously inaccurate or unavailable for the Greenlandic population, due to limited central registration of the data. For example, no nationwide registration of employment exists for recent years. This makes a closer examination of possible social indicators of suicide impossible. (This is also true for other circumpolar regions. Marshall and Soule (1996) report that ecological studies have suffered from low explanatory power, due to the fact that information on 'explanatory variables' is inaccurate or unavailable in circumpolar regions. Cross-sectional and longitudinal studies on suicide among native populations have been limited by small numbers within communities and/or covering only a few years.)

Regional variation of suicide

The assumption that high suicide rates since the mid 1970's are related to the modernization of Greenland implies that the regional pattern of suicide mortality

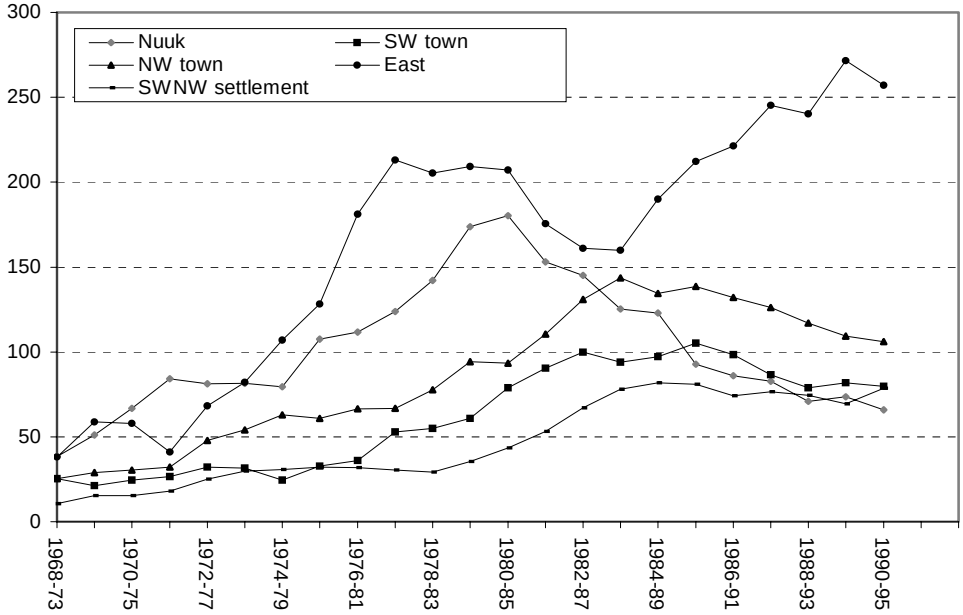

Fig 7: Suicide rates per 100,000 population distirbuted by regions over the period 1968-95

corresponds with the way in which different regions have been influenced by the modernization of Greenland. This paragraph is focused on this relationship.

While a great majority of the population has adapted well to the new situation, for others the changes just happened to fast, indicated by the widespread use of alcohol and the increasing numbers of violence and suicide. However, change took place to a different degree and at a different pace among the communities. The capital of Nuuk was one of the first to experience profound societal changes. Soon modernization spread to larger towns in the south and north of West-Greenland and eventually reached the smaller communities in even the most marginal regions.

Figure 7 shows the temporal development of age-standardized suicide rates (standard population: native population in 1968-1995) for five different regions: the capital of Nuuk, towns in southern West-Greenland, towns in northern West-Greenland, settlements in West-Greenland and towns and settlements in East-Greenland. The different regions are defined on basis of their geographic location. Table 4 shows which towns and settlements are included by the different regions. Though grouping of the communities in five geographically different regions allows to identify regional trends, this ignores the fact that there are marked differences in living conditions within the regions. The populations in the communities are rather small, leading to unstable mortality rates, so that some kind of grouping of the communities was necessary. As a result the pattern found provides only a very crude and general impression.

Table 4: Regions of Greenland with corresponding towns and settlements

Region	**Towns and/or settlements included**
Nuuk	Nuuk
SW towns	Nanortalik; Narsaq; Qaqortoq; Paamiut; Maniitsoq; Sisimiut
NW towns	Qasigiannuit; Aasiaat; Ilulissat; Qeqertarsuaq; Uummannaq; Upernavik;
SWNW settlements	Nanortalik; Narsaq; Qaqortoq; Paamiut; Maniitsoq; Sisimiut; Qasigiannuit; Aasiaat; Ilulissat; Qeqertarsuaq; Uummannaq; Upernavik; Kangaatsiaq (town en settlement)*
East	Ammassalik; Ittoqqortoormiut (towns en settlements)

** the town of Kangaatsiaq in included by settlements as it is not bigger than 260 inhabitants*

The Figure shows that in the 1970's suicide rates increased in all regions. The most pronounced rise of the number of suicide occurred in East-Greenland and in the capital of Nuuk. By the first half of the 1980's suicide rates were much higher in these regions. In Nuuk rates reached their maximum in the period 1980-85, which is 185 per 100,000 population. In the following years a sharp decline of suicide rates can be found in Nuuk, whereas in East Greenland rates showed a temporarily decline in the mid 80's but continued to increase until the early 1990's.

Towns and settlements in West-Greenland showed a somewhat different pattern in the development of suicide rates. Whereas in the capital of Nuuk rates reached their maximum in the first half of the 1980's, in towns in northern and southern West-Greenland rates reached their maximum much later. In both regions the suicide rates had their maximum in the late 1980's. Furthermore, rates were higher in towns in the northern part of West-Greenland than in the south. In the settlements in West-Greenland rates show no clear maximum. The curve shows a small peak in the late 1980's, but eventually rates have not reached their maximum yet, indicated by a recent increase of suicide rates in the first half of the 1990's.

In sum, the Figure shows two main features that give rise to further questions. First, it appears that the different regions reach their maximum at a different period of time. In general it seems that the more marginal a region is the later suicide rates will reach their maximum. The capital of Nuuk was one of the first communities that has been undergoing pronounced societal changes. In Nuuk rates reach their maximum earlier than in the other regions. This is most interesting, as this pattern may correspond with the way in which the locations have been reached by the progress of the modernization of Greenland. Second, the magnitude of suicide rates differs greatly among regions. Remarkably, the highest rates can be found in the most central and the most marginal region of Greenland, which is on the one hand the capital of Nuuk and on the other towns and settlements in East-Greenland.

Explaining the 'incomprehensible' high suicide rates

The temporal distribution of regional suicide rates indicated a possible relationship between suicide rates and the way regions have been influenced by the postwar-modernization. The five regions had different mortality patterns from suicide. It appeared that regions that have been reached by modernization earlier than others, reach their maximum in suicide rates earlier. This indicates a very general relationship between suicide rates and the progress of modernization in the different regions of Greenland. It may be hypothesized that suicide rates increase in a period of pronounced social and cultural changes and - later on - decreases in a period of adaptation to the new situation.

Most studies trying to explain the dramatic increase of the numbers of suicide in relationship to modernization have in one way or the other dealt with *acculturation, assimilation, westernization* or *urbanization*. In an attempt to understand mental health problems among indigenous communities in Canada, Berry (1985) developed a conceptual framework on acculturation. In his model acculturation refers to behavioral and psychological changes that occur as a result of contact between people from two distinct cultural groups. Along with the conceptual framework Berry proposed a model on acculturative stress. Acculturative stress refers to stress experienced in the process of acculturation and may result in a lowered mental status, substance abuse, domestic violence en eventually suicide. In general, rapid and dramatic socio-cultural change goes along with a high degree of acculturative stress. However, this is not inevitable and according to Berry a number of factors may mediate this relationship. These factors include: the nature of the dominant society, e.g. whether emphasis is put on assimilation or a multicultural society, and demographic, social and psychological characteristics of the individual.

Of particular importance in the model is the notion of four different strategies on how individuals may adapt to acculturation*: integration, assimilation, separation* and *marginalization*. The four strategies of acculturation are identified by combining positive and negative answers to the following two questions: 'Is it considered to be of value to maintain cultural identity and characteristics?' and 'Is it considered to be of value to maintain relationships with the dominant society?' (Figure 8). Especially in the case of marginalization, where the individual is out of contact with both the traditional culture and the dominant society, resulting in feelings of alienation and loss of identity, acculturation is likely to be associated with mental health problems. The formulation of the two questions seems to be rather awkward, as they may suggest that the way the individual acculturates is a conscious choice, which is of course much too simple (Lynge, 1997).

		Issue1 Is it considered to be of value to maintain cultural identity and characteristics?	
		‘Yes’	No’
Issue 2 Is it considered to be of value to maintain relationships other groups?	‘Yes’	**Integration**	**Assimilation**
	‘No’	**Separation**	**Marginalization**

Fig. 8: Acculturation framework

Berry’s model on acculturation and acculturation strategies indicates that groups and individuals may adopt differently to modernization. Whereas some groups or individuals succeed in creating a positive identity, by a positive relationship with both, traditional identity and modern values. Others get lost when they are not able to maintain a positive relationship with the traditional nor the modern culture. Moreover Berry identified a number of important factors that play a role in how one adopts to acculturation. However, his model is categorical rather than psychological in nature. It does not explain the psychological process people in Greenland had to deal with when faced with pronounced changes in their lives. The question remains, which behavioral competencies and cognitive shifts have to be accomplished to succeed in a rapidly changing environment.

Another approach to explain the high suicide rates among Inuit in Greenland has been proposed by Lynge (1985, 1994, 1997). In her work she focuses on the ongoing significance of traditional Inuit values and sheds some light on the psychological dynamics between the individual and a changing social environment. Inspired by the work of Jean Briggs on the socialization of the Canadian Inuit (Briggs, 1970, 1985) she refers to the importance of the traditional Inuit values of independence, autonomy, supreme skill, and non-interference with other people. In traditional times these values were of significant importance in the upbringing of Inuit children, as they were of great value for a person growing up in a hunting society and to survive in the very rough and demanding environment. According to Lynge these values may have counterproductive effects for young people today. One may doubt whether traditional values of autonomy and non-interference are functional today, where life in the communities is dependent on solidarity, mutual commitment and common responsibility. Lynge believes that the traditional way of upbringing increases the vulnerability and psychological distress of young people, when

confronted with occupational failure and rejection by others. The youth experiences no real autonomy nor real attachment, and feelings of abandonment, anger and/or hopelessness, with profound loneliness and no ways of finding help, may be the consequence. This is confirmed by the story of a number of suicides. The breakup of a significant relationship, frequent conflicts within the family and friends and not seeking help when experiencing suicidal thoughts is commonly found among suicides in Greenland (Lynge, 1985).

Next to the observations made by Lynge, the recent development of 'Youth', as a new social category seems to be of particular importance. In a recent study, Thorslund (1990, 1991, 1992) proposes a socio-psychological approach of socialization of young Greenlanders. According to Thorslund (1992), a new social category of Inuit youth has been created within the process of postwar-modernization. Traditionally, young people made the transition from child to adult when one could get a regular catch or cook and prepare the catch. By modernization this traditional form of transition has been changed in its basic character. A transitional period has been created by wage-labor, institutionalization and individualization. Through further socialization and qualification in this period, the youth has to make important decisions and has to develop further competencies for their future (e.g. the education and occupation they want to accomplish and the social activities and relationships they want to be involved in). Youth has developed as a new developmental phase, with specific problems that have not been dealt with in traditional times.

The Inuit culture has not been familiar with the phenomenon of a distinct youth group, and according to Thorslund (1992) this contributes to the difficulties young people experience in developing a sense of identity and independence. Along problems related to the emergence of youth as a distinct social group, Thorslund refers to the work of Langgaard (1986) and Lynge (1985) on the ongoing significance of traditional Inuit values in the rearing of children. On basis of his assumptions on the socialization of Inuit youth Thorslund developed a theoretical model. His model will not be outlined here in greater detail, but a rather controversial statement by the author demands our attention. While most authors agree that societal change happened too fast in the communities, Thorslund gives a very different interpretation. Based on rather limited empirical data compared to the theoretical body of his work, he sees the increasing number of suicides as a result of the social changes not happening fast enough to meet the expectations of the young people (Thorslund, 1992). This controversial interpretation is not shared by other researchers (Lynge, 1994; Bjerregaard & Young, 1998). Lynge (1994) finds his statement precariously simple, as politicians, concerned about the problem, could be tempted to argue for speeding up

the process of modernization on this account. Furthermore she argues, that this type of argumentation gives no room for explaining the dynamics between the individual and the changing society, e.g. how are the expectations of the young nourished and do the hopes and expectations solely build on fantasies (inspired from American and European television)?

Though Thorslund's interpretation is critical indeed, it corresponds with findings presented by Bjerregaard and Young (1998) that at least most of the elderly regarded the changes during their life time to be good. Thorslund makes an important point in that rapid social change, happening too fast, is not the only interpretation of the dramatic increase of suicide rates in Greenland.

Conclusion

The way people deal with problems in their daily life and the way they give meaning to their daily activities is influenced by culture in many ways. Each culture provides people with values and practices that are adaptive within the social environment. In traditional populations, exposure to rapid social changes may lead to alienation from traditional values and social instability. As a result people may no longer have the competencies to handle the problems faced. Especially when there is a conflict between traditional and modern values, problem-solving capacities may be reduced. In Greenland traditional values of non-interference and autonomy seem to be of ongoing significance. One may question whether these values are in conflict with contemporary life in the communities, where life is dependent on mutual commitment and common responsibility. Problem-solving strategies that were appropriate in traditional times may be no longer be adaptive in these days. As a consequence the Inuit may suffer from low self-esteem and some may lose their sense of meaning and purpose in life. In Greenland the youth is confronted with a discrepancy between traditional and modern values. Yet 'Youth' is a critical developmental period where the individual creates a stable sense of identity and character. This could explain why especially the Inuit youth is in trouble.

In recent decades a considerable number of young people have lost their sense of direction, directly or indirectly induced by an unstable and rapidly changing environment. Concerning the theoretical interpretations presented, all approaches address the importance of postwar-modernization in relationship to suicide, though they differ in their approach and the issues they emphasize on. At the same time one has to be cautious not to simply blame modernization as the cause of increased suicide rates. On the individual level many questions remain concerning which individual competencies are relevant in successful adaptation. Questions are: What are the

critical problems the Inuit youth has to deal with? What are the determinants of successful adaptation in a society in transition? Which attitudes do young people in Greenland have towards life in the communities? And, which expectations do they have regarding their future?

While a general relationship between suicide and modernization is indicated by the temporal distribution of suicide rates across regions, central aspects concerning the dynamics between the individual and the society remain unclear. This is illustrated by Lynge's argumentation against Thorslund's interpretation of the causes of high suicide rates among Inuit youth. Whereas Thorslund sees the recent increase of suicide rates caused by social change not happening fast enough to meet the expectations of the youth, Lynge argues that the expectations of young people may be based on misleading examples from American and European television and magazines. The discrepancy between an ideal life-style, possibly inspired by the life of American and European peers, and actual possibilities in the communities may have induced dysfunctional attitudes and expectations. The result are a lowered sense of self-esteem, a negative self-image and general anxiety.

In this context some have called for programs concentrating on reestablishing a sense of community and belonging by reinforcing traditional Inuit values and beliefs. Yet, going back to the old is not a solution for the young people of today.

6. Closing and recommendations

In this report a number of areas related to suicide in Greenland have been addressed to shed some light on the 'incomprehensible' high number of suicides since the mid 1970's. To begin with recent developments in the epidemiology of suicide have been described. In the first half of the 1990's suicide rates appear to have stabilized, though rates remain extremely high and suicide has to be regarded as a persistent health problem in Greenland. The number of suicides is dramatically high and especially young people commit suicide. Next, information on the social and psychological background of persons committing suicide has been presented, based on death certificates and police reports. General characteristics were found. These included *frequent conflicts within the family and friends, a recent breakup of a significant relationship, experience of a stressful life-experience, expressing suicidal intentions* and *acute alcohol abuse*. Although these aspects may be important risk-factors of suicide among the Greenlandic population, the data have not systematically been recorded in death certificates and police reports and no comparable data exists for the general population. Consequently no straightforward conclusions can be drawn. In addition, making comparisons with non-aboriginal populations is problematic. The description of common characteristics of suicides has been followed by a discussion of the relationship between postwar-modernization of the society and the increase of suicide rates since the mid 1970's. Data were presented on socio-demographic indicators of suicide and special attention was given to the temporal variation of suicide rates in the different regions. The results indicates distinct temporal development of suicide rates in the regions, that corresponds with the general progress of postwar-modernization.

In this final section possibilities for future research on suicide and relevant topics for prevention and intervention are presented. Much of the research in the past has been carried out by non-Greenlandic researchers, who harvest information on a issue of their interest and give only few in return to the Greenlandic communities. In recent years the Inuit have become aware of this situation and have demanded more attention for the central public health problems in the communities (Bjerregaard & Young, 1998). Concerning suicide and other forms of self-destructive behavior the communities are in need of practical relevant information and directions for early identification and prevention.

Research agenda:

- On the basis of the computerized register of causes of death, established by Bjerregaard, the epidemiology of suicides can be described to a large extent. A continuous update of the register is necessary to identify recent and future changes in the trend of suicide and other causes of death.
- Little is known about non-fatal suicide attempts in Greenland. Among non-aboriginal populations the rate of suicide attempts is much higher than the number of suicides. Completed cases of suicide are only the top of a possibly even larger number of suicide attempts and other self-destructive behaviors. Therefore, future research should address the epidemiology suicide attempts and other forms of self-destructive behavior.
- In order to develop effective interventions to prevent people from committing suicide or repeating non-fatal suicidal behavior, we need more information on the social and psychological background of persons committing suicide. Police reports and death certificates form a possible source of information, but are rather limited in the extent of information given. A new look at the structure of the police reports and death certificates may be needed, or a new form should be developed addressing suicides from a more social and/or psychological perspective.
- The number of suicide is dramatically high, especially among young Inuit males. Future research should focus on the causes of high suicide rates among the youth. In this context the ongoing significance of traditional Inuit values may be important. At the same time little is known on the attitudes of the youth towards recent societal developments and their perception of the future. A general understanding of the situation of Inuit youth in the communities is necessary to identify determinants of suicide among the youth.
- Dysfunctional and unstable social relationships seem to be important risk-factors for suicide among the Greenlandic population. The significance of social networks in relationship to suicides should be a central issue in future research on suicide among Inuit youth.
- Among the communities, eastern districts have the highest suicide rates. Future research may focus on community-based research in the communities with extremely high suicide rates.

Relevant topics for intervention and prevention

Within the health care section it becomes clear that merely increasing health services is not sufficient to improve health conditions (Bjerregaard & Young, 1998). The

overall situation in the communities has to be taken into account, when developing programs on improving the health status of the population. Community-based interventions have to go along with an appropriate political policy and cooperation between the different departments of the local authorities. In Greenland a number of programs have been developed to prevent people from committing suicide and to provide adequate information on how family members and friends can support those expressing suicidal thoughts. Attention has been called for through radio and TV, and information material has been published for both, professionals and the general population. A telephone line has been opened at the central hospital in Nuuk for those who suffer from suicidal intentions or are afraid of a relative or friend committing suicide. In 1997 and 1998 a training program on primary intervention were given to resource persons, e.g. social workers, teachers, priests, in the municipalities. In 1997 and 1999 two additional courses were held for resource persons in the eastern Ammassalik municipality, where suicide rates are extremely high. Furthermore, in the capital of Nuuk a working group for those who experienced a suicide among relatives or friends has been established.

The effect of these programs has yet to be proved, though some positive trends have already been reported. In a report by PAARISA (1999), it is stated that in the year 1998 the number of suicides in East Greenland have decreased, possibly as a result of a program established there.

Prevention and intervention:

- The most obvious strategy in suicide prevention and intervention in Greenland are community based programs (Rodgers, 1990). This includes teaching and support of local health workers and the establishment of local prevention programs on suicide, alcohol and child abuse, if they don't already exist. The local people are to be informed on public health problems and to be involved in these matters, also to increase a sense of community and shared concern. The price for not discussing these matters, is to isolate those who suffer from suicidal intentions.
- Of particular importance is the early identification of persons being at high risk of committing suicide. This means education of local health workers and the general public on possible predictors of suicide, e.g. male aged 15-25, frequent conflicts with family and friends, recent breakup of intimate relationship, expression of suicidal intentions and acute alcohol abuse. Culturally, early identification is problematic, because traditional Inuit values

of non-interference and autonomy may increase the resistance to make use of public health services and interfere with the personal problems of others.

- A study by Thorslund (though based on limited empirical data: nationwide questionnaire distributed to 320 youngsters; reply-rate 49%) indicated that few young people condemn suicide, few understand suicide as a sign of psychiatry disease and that a majority interprets suicide as a regrettable reaction towards some common problems in life: conflicts with a girlfriend or with parents, too much alcohol or some personal problems (Thorslund, 1992). This may indicate that suicide has become accepted as a way to solve problems among the Inuit youth.
- Though suicide, especially among the young, may be the most dramatic health problem in Greenland, this should not lead to a preoccupation with the problem of suicide and away from the larger community problems which may have initiated suicidal and other forms of self-destructive behavior.

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Appendix

To identify demographic indicators Greenland was divided in 20 different locations. These locations were defined on bases of their geographic location. The native population of these locations varied between 759 in North Greenland to 7796 in the capital, Nuuk. Age-standardized suicide rates (standard population: native population in 1980-95) have been calculated for the 20 locations to be correlated with demographic indicators. Data on economic indicators were available only at the municipality level (N=17).

Demographic indicators:

- *population change*: change in population number form 1980-83 to 1993-1995
- *community size*: average community size (Greenlanders and Danes) in the period 1980-95.
  (Source: Statistical Yearbooks)

Economic variables:

- *average taxable income*: average taxable income per household 1988-95.
- *housing standard*: average square meters per person 1995-98.
  (Source: Statistical Yearbooks)

Correlates were calculated using SPSS; bivariate correlation Spearman brown (R(S)).

Table 5: Demographic variables and age-standardized suicide rates specified by regions. (standard population: native population in 1980-95). Population change form 1980-82 to 1993-95. Community size: Average community size in 1980-95 (Greenlanders and Danes).

Region	**Population**		**Population Change**	**Community size**	**Suicide rate ***
	Number	%	%	Number	
Nuuk	7796	17,5	43,6	11154	114
SW Towns					
Nanortalik (1)	1296	2,9	8,5	1471	120
Qaqortoq (1)	2433	5,5	29,0	2940	90
Narsaq (1)	1546	3,5	8,0	1781	121
Paamiut (1)	1973	4,4	-1,4	2251	129
Maniitsoq (1)	2647	5,9	8,4	3076	84
Sisimiut (1)	3944	8,8	24,3	4630	49
NW Towns					
Aasiaat, Qeqertarssuaq (2)	3767	8,4	9,9	2130	92
Qasisiannguit (1)	1516	3,4	-10,0	1663	102
Ilulissat (1)	3533	7,9	12,5	4006	149
Uummannaq, Upernavik (2)	2028	4,5	25,7	1130	115
SW Settlements					
Nanortalik, Qaqortoq (10)	1608	3,6	-13,8	166	74
Narsaq, Paamiut, Nuuk (8)	968	2,2	-11,1	126	64
Maniitsoq, Sisimiut (5)	1111	2,5	0,3	231	91
NW Settlements					
Kangaatsiaq, Disko Bay (11)	2115	4,7	13,5	214	48
Uummannaq (7)	1143	2,6	6,0	166	95
Upernavik (9)	1365	3,1	25,3	153	75
East					
Ammassalik, Ittoqqortootmiit (2)	1591	3,6	36,9	921	279
Settlements (8)	1445	3,2	-12,9	186	171
North					
Qaanaaq + settlements (6)	759	1,7	13,8	136	102
Total	44582	100	15,6	671	107

Table 6: Economic variables and age-standardized suicide rates specified by regions. (standard population: native population in 1980-95). Housing: average square meters per person 1995-98. Income: average taxable income per household 1988-95.

	Population		Housing standard	Income in DK	Suicide rate *
	Number	%			
Nuuk	8231	18,5	28,0	166597	112
Nanortalik	2489	5,6	21,2	95460	96
Qaqortoq	2847	6,4	25,4	124811	91
Narsaq	1742	3,9	27,0	122071	115
Paamiut	2310	5,2	31,7	114460	119
Manisioq	3537	7,9	23,8	125701	84
Sisimiut	4166	9,3	23,6	141555	53
Kanngasuitnnq	1261	2,8	19,7	92918	48
Aasiat	3115	7,0	24,0	116991	90
Qasigiannguit	1617	3,6	25,5	121674	97
Ilulisat	3931	8,8	23,6	125052	139
Qeqertarsuaq	1007	2,3	27,4	138158	87
Uummannaq	2332	5,2	22,7	116955	84
Upernavik	2204	4,9	16,3	92961	115
Qaanaaq	759	1,7	21,0	87110	102
Ammasalik	2570	5,8	21,0	92415	238
Ittortootmuit	466	1,0	25,7	121386	180
Total	44582	100	24,2	135675	106,9654

Table 6: Rank sum correlation coefficients (Spearman test, R (S) and p-values) for age-standardized suicide rates and demographic variables.

	All regions R (S)	**p**	**West Greenland R (S)**	**p**
Population change	0.04	0.88	0.01	0.96
Community size	0.21	0.37	0.37	0.15
N	20		17	

Table 7: Rank sum correlation coefficients (Spearman test, R (S) and p-values) for age-standardized suicide rates and economic variables.

	All regions R (S)	**P**	**West Greenland R (S)**	**p**
Housing standard	0.20	0.45	0.39	0.17
Income	-0.20	0.43	0.02	0.94
N	17		14	

* income and housing standard correlated with 0.62** for all regions