

SIFA rapport

Nr. 5/93

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TRENDS AND VARIATIONS IN SUICIDE IN NORWAY

A description and short bibliography

Statens institutt for alkohol- og narkotikaforskning
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National Institute for Alcohol and Drug Research
Oslo 1993
ISBN 82-7171-176-8

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Introduction

The present manuscript is aimed at summarizing a description of regional variations in suicide in Norway with particular focus on gender, age profiles and use of methods in suicide. Furthermore, the present manuscript will give a brief overview of national literature on explanations to temporal variations and regional variations in suicide in Norway as well as a summary of risk factors for suicide that have been emphasized in the national literature. Finally, a minor bibliography of theoretical and empirical approaches to the association between alcohol and suicide in Norway will be given.

Description of regional variations

The choice of unit for regional analyses of suicide rates depends on several factors and should be considered carefully. A limiting factor can be the availability of data on a sufficiently detailed level as for instance city regions in large cities. On the other hand, municipality, and even county, can be a unit with too few inhabitants to obtain adequate estimates of suicide rates even across a series of years. But the deciding factor will of course be the research question at stake. Which leads us to ask: "At which geographical level or unit can the variation in the ecological factor for this specific purpose be studied most efficiently?"

Data on suicide rates are available on a municipality level in Norway, and they can be aggregated to trade areas, counties, and regions. With more than 450 municipalities in a country of 4 million inhabitants, the pure descriptions of geographical variations will in this manuscript be presented with county or region as geographical unit. Some descriptions will, however, also be given for variations in suicide rates with respect to industrial structure at the municipality level.

Table 1.

Suicide rates for each county summed across 4 year periods from 1959 to 1987. Age standardized and gender specific rates.

	M E N						W O M E N					
	59-62	64-67	69-72	71-75	79-82	84-88	59-62	64-67	69-72	71-75	79-82	84-88
Østf	8	12	16	16	17	22	3	2	3	3	6	7
Akersh	11	12	12	12	20	22	4	3	4	4	8	7
Oslo	14	15	16	23	26	26	6	7	8	8	14	16
Hedm	19	16	17	18	24	25	2	4	5	4	7	7
Oppla	14	18	20	20	20	30	3	2	3	4	7	8
Busker	17	15	16	16	23	24	3	5	7	6	6	10
Vestfol	14	15	12	14	18	19	4	4	5	6	6	9
Telem	11	16	13	15	20	23	3	3	3	4	6	7
A-Agd	12	8	14	14	18	22	3	2	2	3	5	12
V-Agd	17	6	11	10	17	26	4	2	3	3	7	7
Rogala	8	9	9	12	14	18	2	3	3	3	7	6
Hordal	8	8	12	10	15	17	4	2	4	5	6	6
So + Fj	11	8	14	13	14	20	3	2	3	5	3	6
Mø + R	8	5	10	10	14	15	2	3	4	5	5	5
S-Trø	10	9	9	11	14	23	2	3	3	3	6	5
N-Trø	10	8	9	12	22	23	3	2	2	3	8	10
Nordl	9	10	9	9	18	19	2	2	2	2	5	5
Troms	8	5	10	10	18	23	1	2	5	6	4	5
Finnm	18	13	8	11	19	36	0	3	1	2	6	7
Whole countr	12	11	13	14	19	22	3	3	4	5	7	8

In the further studies of geographical co-variation in suicide rates and alcohol consumption will, however, be based on trade area as geographical unit, hence reflecting availability of alcohol. Whereas analyses of cultural availability of suicide will be based on the lowest level of geographical unit, the municipality.

Table 1 gives the age standardized and gender specific suicide rates for each county in Norway, summed across 4 year periods from 1959 to 1987. A certain, although not very dramatic, variation in suicide rates between the counties can be seen throughout the past three decades.

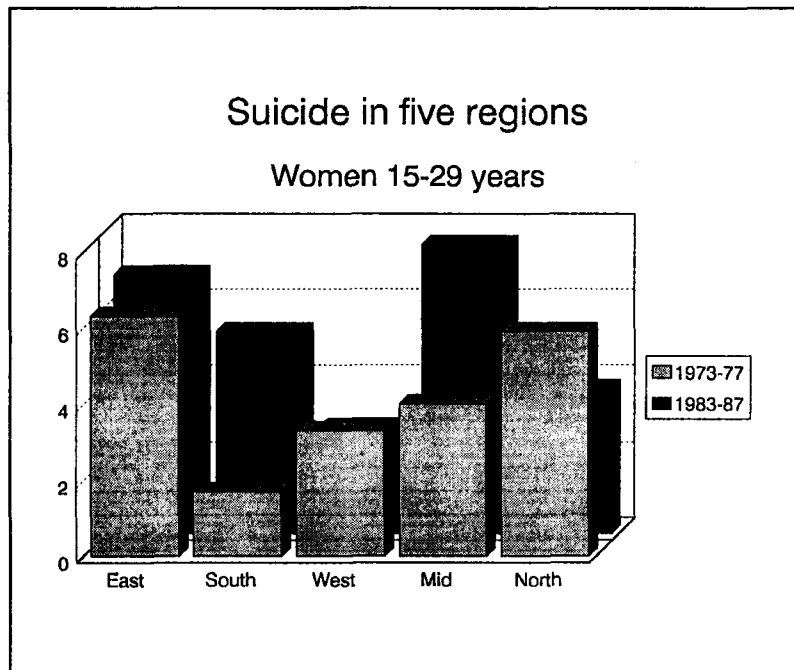
Generally the figures of Table 1 illustrate that an increase in suicide rates has taken place all over the country over the time span of almost 30 years. The relative increase varies, however, significantly between the counties and differs for men and women. The differences between the counties can in part be due to cultural differences between regions of the country, but they can partly also be ascribed to degree of urbanity or population density. Furthermore, the counties also vary considerably with respect to industrial structure and hence they vary with respect to the changes and potentials in the labor market.

Geographical regions in Norway



The most dramatic increase in the suicide rates in Norway has taken place during the 70'ies and the 80'ies, and the further descriptions will be based on data from these two decades. The data that are presented in Figures 1 - 5 are based on tables given by Asbjørn Aase in his article "Selvmord i Norge - noen mønstre i tid og rom (Suicide in Norway - some patterns in time and space)", (1991).

Figure 1



Figures 1- 4 illustrate the changes in suicide rates in five regions from the 70'ies to the 80'ies within the two age groups (under and above 30 years) and for the two genders separately. It is noteworthy that the most marked changes in suicide rates can be seen among men 15-29 years

(Figure 3) and among women 30 years and older (Figure 2).

Figure 2

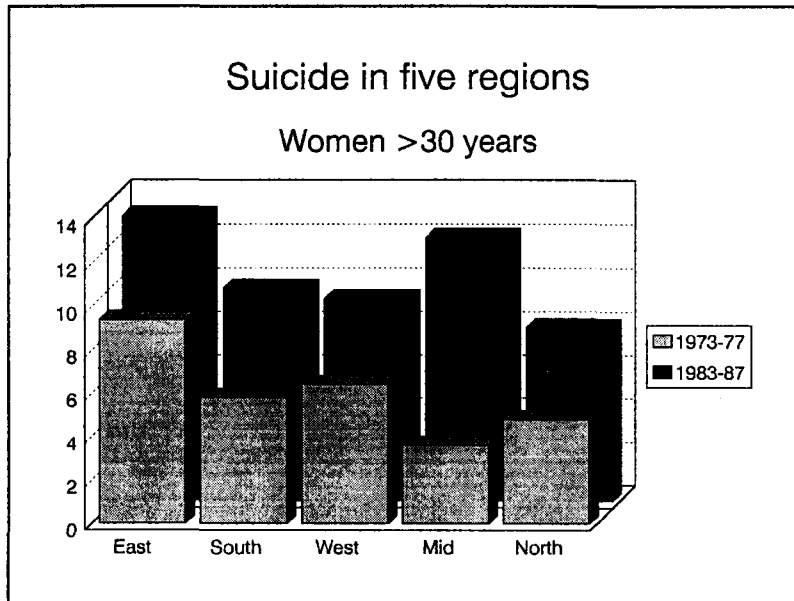
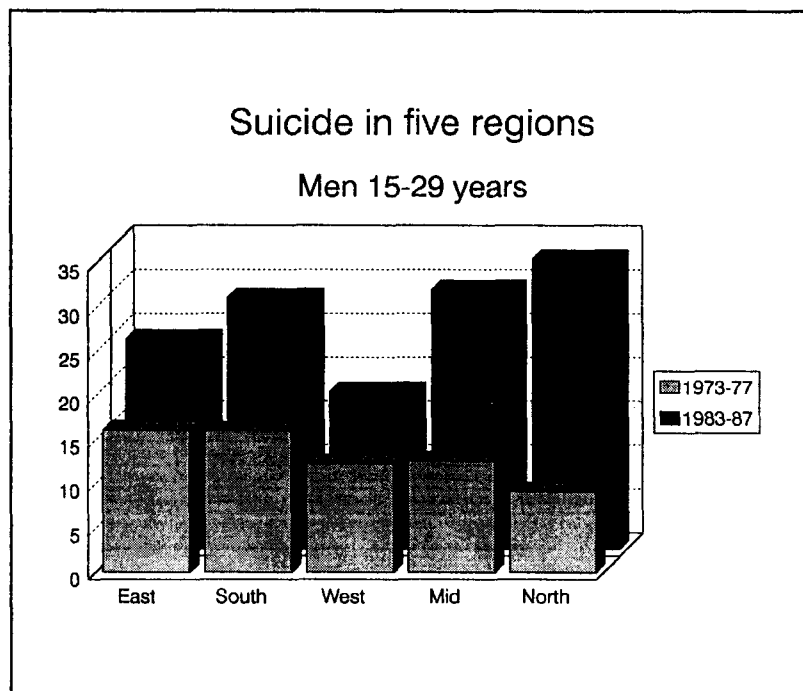
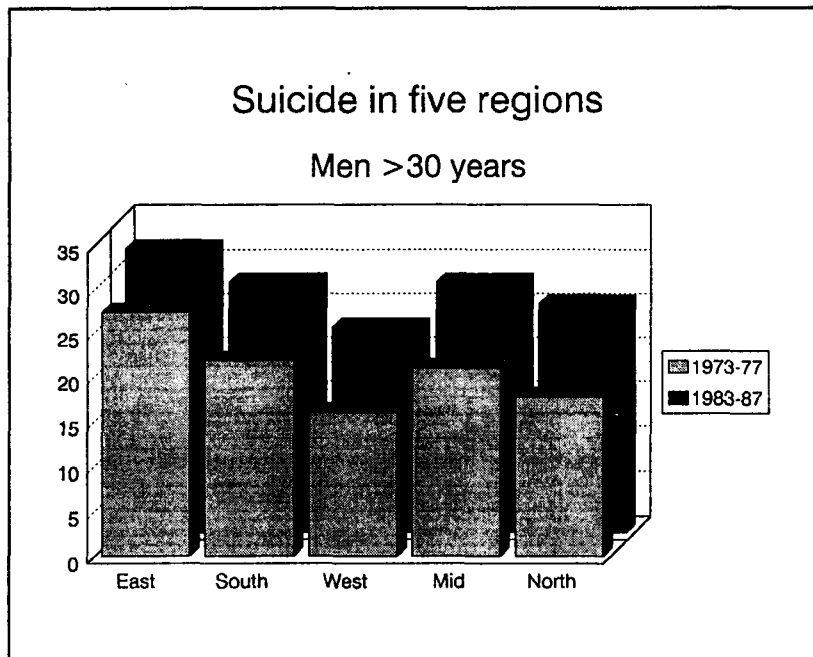


Figure 3



The increase in suicide rates among young men has clearly been most pronounced in the northern region of Norway, whereas the increase in suicide rates among middle aged and elder women has been more evenly distributed between the geographical regions. The increase in suicide rates among young women (Figure 1) was relatively low, whereas the increase in suicide rates among middle aged and elder men was somewhat less than among younger men, and the increase was evenly distributed between the regions.

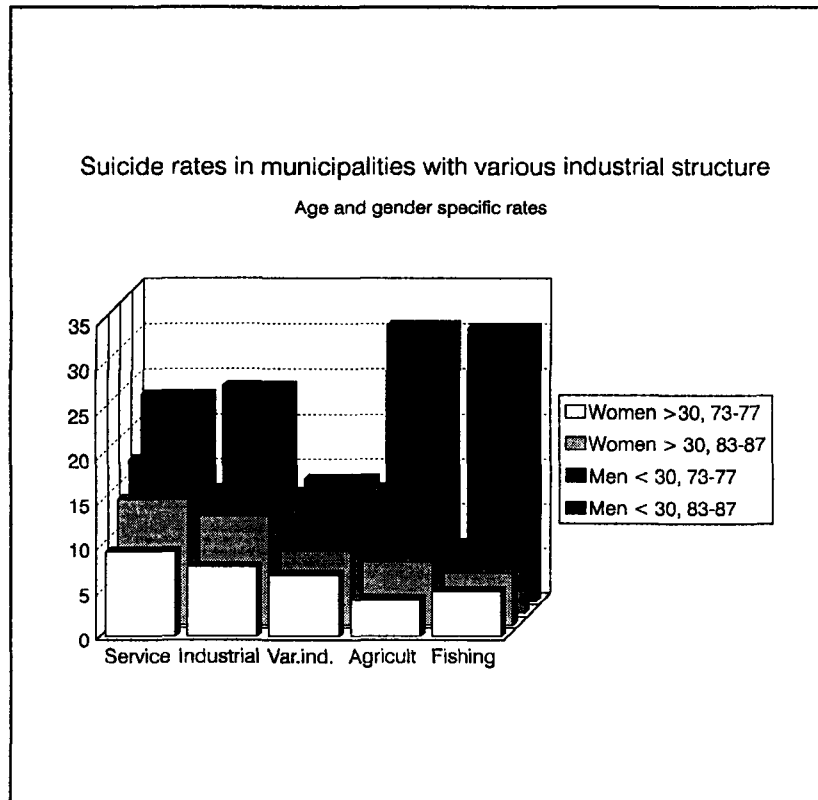
Figure 4



The above described marked differences naturally lead to the raising of the question "What kind of properties or features of these regions interact with gender and age so as to produce these various changes in suicide rates over time?" Are the differences indicative of urbanization and geographical mobility, or can they be explained by differences in industrial structure and thereby changes in the labor market in the municipality, or both?

Figure 5 illustrates the various suicide rates from 1973-77 and 1983-87 between categories of municipalities with various industrial structures. The classification standard that these categories are built upon does, however, not merely reflect the industrial structure of the municipality, but also the degree of urbanity or centrality.

Figure 5.



Central service providing municipalities (Service) comprise the larger cities in Norway and their surrounding municipalities if the travel time to the city is short. More than twice as many are employed in service industry as in production of goods. Central industrial municipalities (Industrial) comprise towns and cities in central areas, and the industry is mainly based upon production of goods. Municipalities with various industry (Var.ind) comprise smaller towns and municipalities of less centrality in which employment is distributed between various industries. Municipalities in which agriculture provides the main basis for employment (Agricult) are also rural and sparsely populated municipalities, which is also the case for municipalities in which fishing is the main industry (Fishing).

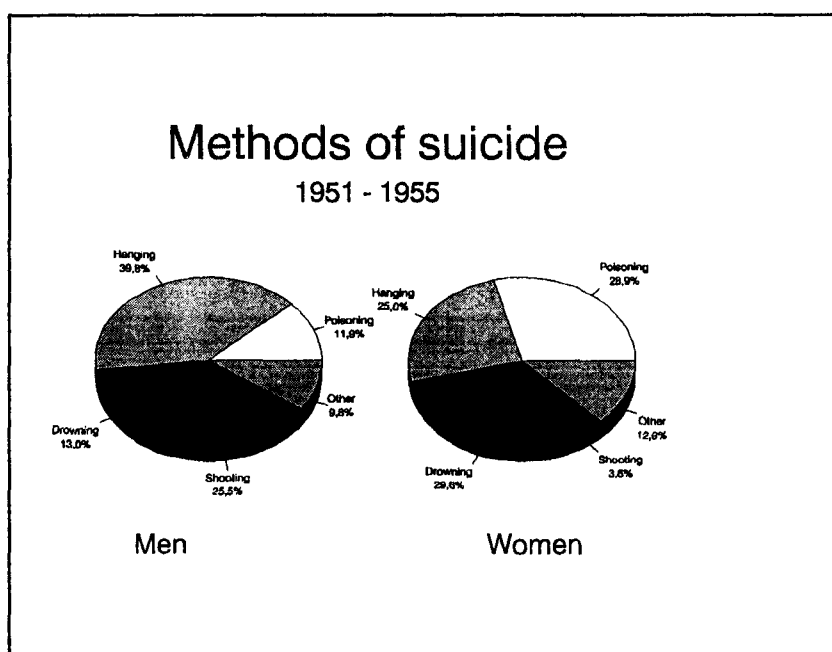
The suicide rates for the two time periods are given for the two population groups with the most significant increase in suicide rates, namely women above 30 years and men 15-29 years. An increase in suicide rates from the 70'ies to the 80'ies can be seen more or less for all categories of industrial structures for both population groups. The tendencies in increase for the various categories of industrial structure are, however, rather opposite for the two population groups. The absolute levels as well as the relative increase in suicide rates was higher in the more urban or central municipalities among women above 30 years, and the tendency of a higher suicide rate with a higher degree of urbanization was only fortified from the 70'ies to the 80'ies. The most striking change in suicide rates from the one decade to the next, was, however, the virtual reversal of the correlation between suicide rates and urbanity among younger men. From the 70'ies to the 80'ies the suicide rates in this group did not only display the largest relative increase in the rural municipalities, but in absolute levels the suicide rates also turned from the lowest to the highest in the rural areas.

During this period urbanization and moving away from rural areas have continued, the proportion of young and middle aged people who live alone has increased, and unemployment has to a larger extent affected societies with a uniform and hence vulnerable industry and labor market. Thus, explanations to the above mentioned marked and rather diverse changes in the suicide rates can be sought in the impact of the significant social changes that have taken place during the past decades.

Methods of suicide

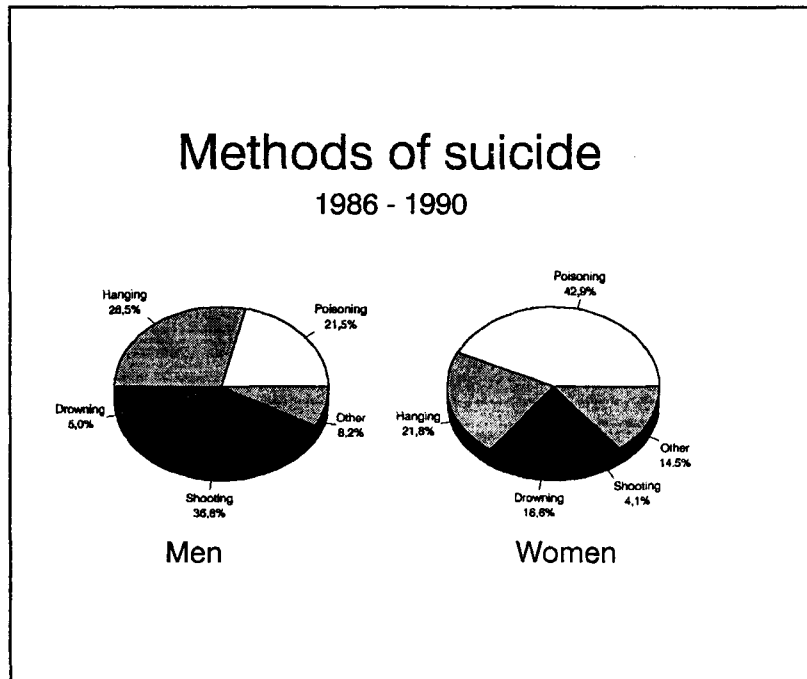
Reports on suicide from the 19th century (Sundt, 1855; Strøm, 1883) give a description of the most frequently used methods of suicide at that time. The preferred mode of suicide was hanging for both men and women (70% and 57%, respectively), whereas 18% of men and 34% of women committed suicide by drowning. During this century the picture has gradually changed, probably as a result of altered availability of various means for suicide. The distributions of methods applied for suicide in the post war years are given for men and women separately and for the time periods 1951 - 1955 and 1986 - 1990 in Figures 6 and 7, respectively.

Figure 6.



Compared to the figures from the 19th century, hanging has to a large extent been replaced with poisoning and shooting, and this trend has been fortified within the past decades. Shooting is in Norway, as in other countries, preferred by men, whereas women to an increasing extent commit suicide by poisoning.

Figure 7.



The most prevalent means for poisoning are various licit drugs¹, whereas poisoning with domestic gas and carbon monoxide from cars are relatively infrequently applied means.

¹During the 60'ies and 70'ies most suicides by poisoning were committed by use of barbiturates, but as these were mostly taken out of sale in 1980, the present most frequently used drugs are tri-cyclic anti-depressants and neuroleptics (Retterstøl, 1989).

A short bibliography

Reliability of suicide data

From 1826 registrations of suicides were undertaken by the clergy, and from 1854 the registration was also based on medical reports from physicians. The degree to which suicide is under-registered has not been examined thoroughly in Norway until the past few decades.

Comparing Norwegian suicide rates with those of the other Scandinavian countries, the Norwegian suicide rates have during the past century been significantly lower than those in Finland, Sweden and Denmark. This marked difference in a social phenomenon between fairly comparable countries has induced the assumption that the Norwegian suicide rates to a far greater extent has been underestimated than what has been the case in the other Scandinavian countries. This assumption has, however, been countered by Hessø (1987) who reported on the basis of thorough studies that the Norwegian suicide statistics were found to be just as accurate and reliable as those in Denmark, Finland or Sweden. According to Kringlen (1980) suicides are under-registered with approximately 25 % when death is caused by drowning, whereas Ekeberg and co-workers (1985) argued that official suicide statistics in Norway are less than 10% under-estimated. Hence, official statistics on suicide incidence in Norway seem to be fairly reliable, and the significant lower suicide rate in Norway has been explained otherwise.

Bille-Brahe (1987) found in a comparative study of suicide in Norway and Denmark that the degree of social integration was higher in Norway than in Denmark, which, on the basis of Durkheim's arguments of social disintegration as a significant mechanism in egoistic suicide, could explain the lower suicide rates in Norway.

The American psychiatrist Herbert Hendin approached the

Scandinavian suicide paradox in his book "Suicide and Scandinavia" (Hendin, 1964) by interviewing suicide attempters in Denmark, Sweden and Norway, and he attempted to explain differences in suicide rates in these countries by differences in child rearing and release of aggression. Farber (1968) also focused on different patterns in child rearing in Denmark and Norway, and he attributed the lower suicide rate in Norway to a larger degree of warmth and care within Norwegian families. The Finnish sociologist Allardt compared various aspects of well-being and sense of family -, group-, and national belonging in four Nordic countries, and he found that Norway scored higher in these respects (Allardt, 1975) which could account for the lower suicide rates. A comparison of several European countries applying data on family life and family belonging (see Retterstøl, 1978) has demonstrated that Norway and the Netherlands turn out as more favourable in these respects, and these two countries do also display strikingly low suicide rates. Retterstøl (1978) has also pointed to the fact that Norway, in comparison with the other Nordic countries, has had a low divorce rate, a low alcohol consumption level, a low crime rate, and less wide spread drug abuse among youth, indicating the impact of these factors in suicide.

Risk factors in suicide; a brief review

The first analyses of suicide in Norway within the social sciences were undertaken by Eilert Sundt, who published his analyses on the mortality in Norway in 1855. Sundt argued that the increasing suicide rates at that time could be ascribed to the increase in social mobility which would imply a disharmony between the competence and capacity of the individual and the demands and expectations of the society.

A more comprehensive and thorough description of suicide in

Norway in the 19th century was presented by Strøm (1883) and covered all registered suicides over the period from 1826 to 1880. For somewhat more than half of the suicides committed between 1856 and 1872 the assumed main reasons for suicide are given. The most prevalent reasons for men were financial worries, insanity, depression and alcohol addiction, whereas the most prevalent reasons for women were insanity and depression.

Gender

The male : female ratio in suicide rates in Norway has been above unity for the whole period since 1826, although to varying degree. A hundred years ago the ratio was in the magnitude of 4 : 1, for the past decades the ratio has been around 3 : 1. According to Retterstøl (1978) women behave in accordance with the female role also in suicidal actions, and hence behave more carefully, and less violently, which in turn can explain a lesser degree of a fatal outcome in suicidal actions among women.

Age

The age profiles in suicide rates has over the past one and a half century mostly been characterized with an increase in rate with increasing age for men, and a peak in around middle age for women. A change in the age profile has, however, been observed during the past decades. The crude suicide rates have increased significantly over the past 20 years, but the most dramatic increase has been witnessed among young men. Next to Ireland, Norway is the European country which has had the highest increase in suicide among men aged 15-29 years. Among women suicide has increased most significantly in the age groups above 30 years.

Family situation

The suicide rates have generally over the past century been significantly higher among unmarried, divorced and widowed as compared to married persons (Strøm, 1883; Retterstøl, 1978). In a study of suicide and parity Høyer et al (1993) found that the suicide rates among women decreased with increasing number of children. Dissolution of the nuclear family in terms of parental divorce, placement in fosterhomes, etc. has also been described as a significant risk factor in suicidal behavior (Ekeberg, 1993; Rossow & Wichstrøm, 1993).

Occupation

An analysis of mortality in various occupational groups (Kristofersen & Borgan, 1987) demonstrated that suicide varied significantly between occupational groups. Suicide was more than twice as incident among dentists and physicians (SMR = 252) and among waiters (SMR = 243), but also nurses, scientists and artists were found to have a higher suicide incidence (SMR 163-148). Arner (1970) showed that the suicide incidence among seamen was three times as high as in corresponding groups ashore.

Urbanity

The suicide rates in Norway have mostly been higher in cities and urban areas than in rural areas (Strøm, 1883; Rygnestad, 1992). Within cities the suicide incidence has been higher in areas with a shifting population and lack of stability (Retterstøl, 1978). During the past decades, the picture has, however, partly changed. The far most dramatic increases in suicide have taken place in rural areas among young men. Among 15-29 year old men the increase in suicide rates from the 70'ies to the 80'ies has been around 35 % in the larger cities, but the increase has been between 100 and 300 % in agricultural and fishing municipalities (Aase, 1991). Over

the past few years the suicide rate among 15-29 year old men has been clearly highest (66 per 100.000) in the most northern and most rural and sparsely populated county in Norway (Aase, 1991). On the other hand, suicide rates among middle aged and elder women have increased most significantly in the larger cities in Norway (Aase, 1991).

Mental illness

Retterstøl (1990) stated that approximately one third of those who commit suicide have been admitted to psychiatric hospitals. The most common psychiatric diagnoses associated with suicide are depression and schizophrenia. According to Retterstøl (1990) the danger of suicide is most pronounced when the patient is in the recovery phase from depression or in the initial phase of schizophrenia. The role of alcohol abuse and drug abuse in suicide has frequently been described in relation to mental illness, but in the present manuscript the bibliography on this subject will be described separately.

Self-inflicted injuries

The former idea of attempted and completed suicide as one behavioral phenomenon only separated by different outcomes, has gradually been abandoned. Yet, a certain overlap between parasuicide and suicide can be assumed. Rygnestad (1992) showed in a ten year follow-up study that approximately 10% of those who had been admitted to hospital for self-inflicted injuries, would later on commit suicide. Retterstøl et al (1993) found that 27% in a group of 15-29 year olds in Oslo who committed suicide, had previously attempted suicide.

Explanations to trend changes

The crude suicide rate in Norway has over the past 165 years varied as a response to war times, during which significant decreases in suicide have been observed. Although Durkheim (1951) argued that a decrease in suicide rates in war time could be expected, the reliability of suicide data in war times has, however, been questioned (Hammerlin, 1985; Retterstøl, 1990).

The degree to which the suicide rate responds to or covaries with social changes over time has partly been elucidated by means of Norwegian aggregate data. Næss (1986) argued that the increase in suicide among single persons over the period from 1960 -1980 could be due to a social deterioration of the social environment outside the nuclear family as a result of higher geographical mobility, increased urbanization and smaller families and hence fewer siblings.

Gjertsen (1987) has described suicide rates in Norway from 1826 to 1985 and summarized a discussion on the impact of legislation, economic system, political-administrative system and socio-cultural system. He has argued that explanations pertaining to trend changes in suicide rates rather should be sought in socio-cultural contexts stating that "... the qualities of the contexts in which we live are decisive rather than material and political changes alone".

Aase (1991) suggested that regression and crises in the primary industries would affect those of lower education in adaptation to other occupations and locations, which could explain the significant increase in suicide rates among young men in rural districts. Furthermore, he hypothesized that living alone would be a larger burden in big cities, which could account for the increase in suicide rates among middle aged and elder women in urban areas.

Bjerke (1990) pointed at the increase in divorce rates as one possible explanation for the increase in suicide rates among young people, but he also suggested that the increase in suicide rates could be ascribed to increased availability of means for suicide in terms of drugs and fire arms as well as a "cultural availability" in terms of "Werther effect" and spread of suicidal ideation.

Alcohol and suicide;

- a brief overview of the Norwegian literature

The first report in Norway that is indicative of a relationship between alcohol and suicide is the abovementioned report by Strøm (1883) on suicide in Norway. In this report there is referred to the given (assumed) main reasons for the suicide. It should be noted that only somewhat more than half of the suicides were described with respect to the main reason or motive for the action, and it seems justifiable to assume that the given reasons can have been distorted. Nevertheless, over the period from 1856 to 1872, the reasons for suicide are given for a total of 1,390 suicides. Of these 8 % were ascribed to alcohol abuse; 10.4 % of the suicides among men and 0.3 % of the suicides among women.

Three decades later Nicolai Rygg (1915) published a report on alcohol abuse and mortality in which suicides and accidents were emphasized. Rygg found that for the period 1895 - 1911 a total of 5.6 % of the suicides among men in rural areas were ascribed to alcohol abuse, whereas 13.9 % of the male suicides in the cities were ascribed to alcohol abuse. The corresponding figures for women were 0 % and 4 %. Rygg also reported that the proportion of suicides ascribed to alcohol abuse during the same period for men and women in Denmark were 22.8% and 9.1%, respectively.

Sundby (1967), as the first in Norway, studied mortality in male alcoholics, and he found that alcoholics were more prone to suicide than the general population. The proneness to suicide was found to have two maxima among non-vagrant alcoholics; one in younger age and in an active phase of alcoholism, and the second in older age when the alcoholics were assumed to suffer more from the consequences of earlier drinking than from present alcohol consumption.

Lilleng and Morild (1993) found in a forensic study of 377 alcoholics that 18.6% died from suicide, but in this study suicide was most frequently found among middle-aged men. Blood alcohol level above 0.05% was found in 24% of those who died from natural causes and among 50% of those who committed suicide. This figure corresponds to results from other studies on blood alcohol level at time of death in cases of suicide or self-inflicted injuries.

The Norwegian psychiatrist Nils Retterstøl (1978, 1990) has emphasized the role of alcohol abuse and drug abuse in his comprehensive books on suicide. He explains the higher mortality by suicide among alcoholics and drug addicts partly as due to their difficult living situation and sense of hopelessness, and he points to the argument that control mechanisms are impaired under the influence of alcohol or drugs, and the objections against the action are attenuated. But, he also argues that personality characteristics may predispose for both alcohol or drug abuse and for suicidal behavior and that the two behaviors can serve the same function in terms of escape from problems. Furthermore, Retterstøl states that the emotional immaturity that often characterizes the alcoholic or drug abuser, also is characteristic of the suicide attempter. In an empirical study of 144 suicides among 15-29 year olds in the capital of Norway Retterstøl et al (1993) found that in 38% of the cases there was a known alcohol- or drug problem, and in 50 % of the cases alcohol and/or drugs was found in the blood.

Empirical studies on aggregate level data have also confirmed an association between alcohol consumption and suicide in Norway. Norström (1988) showed in a time series analysis of the period 1931-1980 in Norway that an increase in the mean alcohol consumption level of 1 litre per capita above 15 years would give an increase in the male suicide rate of 15% . A somewhat lower, but still significant figure (9%) was found for the male suicide rate when the period was extended to 1911-1990, whereas no statistically significant effect of alcohol consumption on the female suicide rate was found (Rossow, 1993).

Data on parasuicide and intoxicants are rather sparse in Norway. A clinical study of patients admitted to hospital for self-inflicted injuries (Bjerke et al, 1991) demonstrated that the proportion of present and former alcoholics was highest among male repeaters of parasuicide (58%), it was about 30% among male non-repeaters and female repeaters, and lowest (12%) among female non-repeaters.

A very recent national study of 12 000 Norwegian adolescents (Rossow & Wichstrøm, forthcoming) has demonstrated that the probability of having attempted to take one's own life increased significantly with the number of times having been intoxicated with alcohol. Corresponding associations were also demonstrated with respect to intoxication by means of other substances. Confounders as depression, loneliness and living arrangement were controlled for.

In a very recent publication on the national programme for prevention of suicide in Norway (National Health Directorate, 1993), the impact of alcohol and drug abuse in suicidal behavior is emphasized, and it is suggested that suicide prevention also include a strenghtening of preventive efforts against alcohol and drug abuse.

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ISBN 82-7171-176-8

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