

RISC

Risk factors for suicide attempts

An epidemiological study using Danish Register Data

1. Objective

Suicide rates in Denmark have decreased significantly over the last 10-15 years. As a contrast to this there has been an increase in suicide attempts in groups at risk over the last few years.

In cooperation with a professional committee The National Board of Health has published a National programme for prevention of suicide and suicide attempts. The action plan recommends, among others, research within prevention aimed at specific risk factors and groups at risk. From an international research perspective Danish registers offer unique opportunities to researchers by cross-linking registers on an individual basis. The Register of Suicide Attempts, located at the Centre of Suicidological Research and covering the County of Funen since 1989, is the only longitudinal Danish register. Only a few studies have been done on suicide attempts, and no studies have linked Register of Suicide Attempts with other Danish registers.

The overall objective of the study is to identify prevention strategies for suicide attempts/suicides in the general population. This objective comprises:

- Identification of risk factors for suicide attempts/suicide.
- Analyzing the effect of different health care treatments, including drug prescription, to prevent suicide/suicide attempts.
- Focusing on special groups at risk, identified by sex and age. Currently these include adolescents (15-19 years), women (20-29 years and 30-39 years), men (30-39 years and 40-49 years), and men (70+ years). Further description of risk groups in section 3.4.

2. Background

2.1 Suicides

Suicides are identified from Register of Causes of Death administered by the National Board of Health, which facilitates register-based studies on suicides.

2.1.1 Mental illness

Some studies have linked mental illness with suicides. Almost half of all suiciders had been or currently were admitted to a psychiatric hospital (Andersen UA et al., 2000 [n = 472]; Mortensen PB et al., 2000 [n = 811]). The highest risk was in patients currently admitted to or discharged from a psychiatric hospital shortly before death by suicide. Depression is assumed to be present in at least 50 % of all suicides and especially the

the group of suiciders without psychiatric hospitalization were treated insufficiently with antidepressants (Andersen UA et al., 2001 [n = 390]). Two thirds have consulted a general practitioner, and 7 % were discharged from a somatic hospital within the last month before suicide (Andersen UA et al., 2000 [n = 472]).

2.1.2 Family history

A study showed that a family history of completed suicide and psychiatric illness significantly and independently increased suicide risk (Qin P et al., 2002 [n = 4262]). For young people (10-21 years) parental suicide or early death and admission to hospital for a mental illness were strong risk factors. (Agerbo E et al., 2002 [n = 496]).

2.1.3 Social relations

Being single with or without children was associated with higher risk of suicide (Mortensen PB et al., 2000 [n = 811]), but being the mother of a small child is a protective factor (Qin P et al., 2000 [n=811]).

2.1.4 Socio-economical factors

Unemployment and retirement were risk factors for men (Qin P et al., 2000 [n=811]). Higher suicide rates have been found in the capital region than in less urbanised areas. Socioeconomic risk factors like unemployment and low income, especially for people on social income benefits, are highly associated with mental illness, and the importance of these decreased after adjustment of mental illness and mental disorders must be taken into account (Mortensen PB et al., 2000 [n = 811]). The effect of parental socioeconomic factors for young people (10-21 years) decreased after adjustment for a family history of mental illness or suicide (Agerbo E et al., 2002 [n = 496]). People with a history of mental illness and a high income are at greater risk of committing suicide than their lower income counterparts (Agerbo E et al., 2001 [n = 811]).

2.1.5 Contact to health care system

Contacts to the health care system increase prior to suicide. Roughly 70% of all suicides visited their GP within the last month before death (Andersen UA et al., 2000 [n = 472]).

2.1.6 Drug prescription

Psychopharmacological treatment prior to suicides has been investigated. Among patients admitted to a psychiatric department and having a diagnosis of depression 65% purchased antidepressants between discharge from hospital and suicide. Among persons never admitted to a psychiatric department 17% purchased antidepressants prior to suicide (Andersen UA et al., 2001 [n = 390]).

2.2 Attempted suicides

Attempted suicides have been examined from the Register of Suicide Attempts. Other studies have used smaller populations, typically from specific hospital records or surveys.

2.2.1 Mental illness

A study on 541 patients admitted to a Poisoning Treatment Centre (Welcher B et al., 1993) showed an overrepresentation of psychotic disorders and abuse of alcohol, drug or medicine.

2.2.2 Family history

In a survey among 3.042 persons aged 15-24 years an experience of former suicide in the family is a risk factor of suicide attempts (Jessen G et al., 1996)

2.2.3 Social relations

A study based on Register for Suicide Attempts showed increased rates of attempted suicide for single persons (divorcees and never married) in Funen (Wasserman D et al., 1994). In a survey conducted in 1994, 3.4% reported ever attempting suicide. Unmarried, separated, divorced or cohabiting had a higher risk than married of suicide attempts (Kjøller et al., 2000 [n = 1397]).

2.2.4 Socio-economical factors

The risk of suicide attempt did not vary with educational level, but was higher among economically inactive versus active respondents, higher among unskilled versus all employed people (Kjøller et al., 2000 [n = 1397]).

2.2.5 Suicidal ideation.

Suicidal ideation within the past year dominated among 16-24 years old (13%) and decreased with increasing age to 3% among 67+. The prevalence of suicidal ideation and ever having attempted suicide did not vary with age, educational level, but had a higher prevalence among economically inactive groups (especially high among pupils and students compared to economically active groups). Also unmarried and separated or divorced had higher suicidal ideation, while unmarried, separated, divorced or cohabiting had a higher risk than married of suicide attempts (Kjøller et al., 2000 [n = 1397]).

2.2.6 Repeated suicidal behaviour

Repeated suicidal behaviour has been studied in the county of Funen based on Register of Suicide Attempts. Repeaters and non-repeaters did not differ with respect to sex and age. But a higher proportion of repeaters were unemployed or early retired, and the occupational situation had grown worse immediately before the suicide attempt. Repeaters also were more frequently divorced (Bille-Brahe U et al., 1994).

3. Risk Groups

3.1 Persons who has problems with social relations and family history

The overall subject of social relations deals with a *lack of* social relations, *loss of* social relations, or *unstable* social relations. Close relations are people belonging to the household, whether biological family or not. Other important social relations not

belonging to the household are colleagues, either from work or from educational institutions.

Important social relations are age specific.

- For adolescents (15-19 years) close relations are parents, brothers and sisters. Other important relations are schoolmates or colleagues. The risk factors are assumed to be loss of parents, either by separation/divorce or death of parents (eventually by suicide) or hospitalization. A loss of parents may take place by removal of the adolescent from home, and replacement in an institution or family care. Parents may be disabled as a result of illness (eventually a mental disorder), former suicide attempts, or unemployment.
- For age groups 20-29 years close relations may be parents, brothers and sisters, or if a young person is establishing her/his own family husband/wife, partner or children. Other important social relations are colleagues and students.
- For age groups 30-39 year and 40-49 years the closest social relations are to husband/wife or cohabitant and children. Other important social relations are parents, brothers and sisters, and colleagues.
- For older people important social relations are husband/wife or partner. Other important social relations are children and grandchildren.

Focus on a family history of mental illness and suicidal behaviour.

3.2 Persons who has health problems

Other important subjects are loss of abilities. Loss of abilities includes health problems (especially mental illness) alcohol or drug abuse. Drug prescription could be used as a proxy for illness.

Mental health problems could be estimated from admission to a psychiatric hospital, or being a psychiatric out-patient, or contact to psychiatric emergency units. Contact to a general practitioner or a practising specialist might have a psychological background, like a contact to a psychologist. By admission to hospitals (psychiatric or somatic) a diagnosis is made.

Prescription of Drugs is a proxy for problems with mental health:

- Prescription of antidepressants (a proxy for depressions)
- Prescription of anxiolytics (a proxy for anxiety)
- Hypnotics (a proxy for sleeping problems)
- Methadone (N02A C02) a proxy for drug abuse)
- Antabuse (a proxy for alcohol problems)

Other prescribed drugs more related to somatic disease (a proxy for other health problems)

3.3 Persons who has problems with economy, work, education

A *lack* of ability might be a permanent loss of attachment to the labour market due to health problems, old age or lack of education. People typically receive a sort of pension.

Loss of abilities, e.g. work, might be of a more temporary character, where people receive an unemployment or sickness benefit.

3.4 Health care treatment

Mental illness like affective disorders may result in admission to a psychiatric hospital, or outpatient treatment. The illness is diagnosed. After discharge from hospital or during outpatient treatment antidepressants may be prescribed. The effect of treatment will be assessed by occurrence of successive suicides/suicide attempts.

Suicide attempters registered by contact to a hospital, or an emergency ward may later get a prescription of antidepressants. The effect of treatment will be assessed by occurrence of successive suicides/suicide attempts.

The study may distinguish between different antidepressants.

3.5 Risk groups defined by sex and age

Risk groups are identified from Register of Suicides (1990-1998) and Register of Suicide Attempts (1990-2000). The study will pay special attention to:

- Adolescents (15-19 year old).
The rate of attempted suicide for female adolescents has increased dramatically during the 1990's, from 153 per 100,000 (1990) to 553 per 100,000 (2000).
The suicide rate of male adolescents though lower than those of other age groups has increased since the mid 1990's (from 6.5 per 100,000 to 10.9 per 100,000).
- 20-29 year old females.
The rate of attempted suicides for females has increased since 1996 (196 per 100,000) and 2000 (312 per 100,000).
- 30-39 year old.
The rates of attempted suicide for both males and females have decreased in the period 1990 to 1997, but the tendency has reversed since then. A minor increase for men (from 206 per 100,000 to 242 per 100,000) and for women (from 239 per 100,000 to 288 per 100,000) took place in the period 1997-2000.
- 40-49 year old males.
The rates of attempted suicide for males have been stable for a decade, but an increase from 190 per 100,000 (1999) to 251 per 100,000 (2000) might signify a reverse of trend.
- Older males (70+) have the highest rate of suicide (41.6 per 100,000 in 1998) and the rates of attempted suicide have increased from 1999 (57 per 100,000) to 2000 (94 per 100,000).

4. Data

4.1 Register of Suicide Attempts

Persons with suicide attempts are registered in the Register of Suicide Attempts (RSA) since April 1. 1989 in the County of Funen. Suicide attempts are registered consecutively at all hospitals in the county.

Suicide attempters are registered on a personal basis by the use of a unique *personal identification number*, which allow the description of repeated suicidal behaviour, and

linkage to other registers. The register contains *date of suicidal act*, and *methods*, including a categorization of drugs used in self poisoning.

4.2 The Danish Demographic Database

The Danish Demographic Database is a research database containing longitudinal data on the entire population residing in Denmark from 1980 and onwards.

4.2.1 Social relations

The database allows the identification of *parents* and *children* of a suicidal person by use of a personal identification number, including *adopted persons*. Use of these personal numbers also allows the identification of *brothers* and *sisters*. *Marital status* and the *husband/wife* may be identified. The *residence* of a suicidal person may be identified and cross-linked to other persons belonging to the household. Combining these data makes it possible to longitudinally map a suicidal person's close social relations. The database allows the determination of *family type*.

4.2.2 Socio-economic factors

The database contains data on an individual level with respect to education, employment and income. Educational data are *highest completed level of education* and current *courses of education/training*. Attachment to labour market includes *industry*, *full time/part time attachment* and periods of *unemployment*. Income includes *main source of income*, *transfer payments*, *social benefits* and a calculation of *total income* and *wealth*.

4.3 The Prevention register (PR)

The Danish Prevention Register (PR) is a comprehensive national individual based register and comprises several registers.

4.3.1 Register of Causes of Death (RCD)

The death of a suicide attempter is determined by linkage to Register of Causes of Death. The suicidal behaviour of close social relations (family and persons belonging to the household) may be identified. The death (other than suicide) of close social relations (family and persons belonging to the household) may be identified. The data required is *date of death*, [place of death], *cause of death*, *way of death*.

4.3.2 National Patient Register (NPR)

Information on admission to somatic hospitals can be derived from the National Patient Register. In-patients, out-patients, and casualty ward-patients have been registered since 1995. Relevant data are *date of admission*, *date of discharge*, *way of referral*, *cause of contact*, *action diagnosis*.

4.3.3 Register of Health Insurance Statistics (RHIS)

RHIS comprises visits to general practitioners and practising specialists on an individual basis. The data required is *type of service* received (the type of doctor or other health care person), *number of services*, *year of service*.

4.4 Psychiatric Central Register (PCR)

Information on admission to psychiatric hospital can be derived from the Psychiatric Central Register. Relevant data are *date of admission, date of discharge, way of referral, cause of contact, action diagnosis*.

4.5 The pharmacological Database

Information on prescribed subsidised drugs can be derived from the Pharmacological Database. Relevant data are *personal identification number, ATC code, date for making up prescription, reiteration number, and type of prescription maker*.

5. Population

Population under study is from County of Funen (approximately 0.5 million inhabitants and is representative of the Danish population with respect to sex and age). The study comprises the period 1995-1999.

6. Methods

Data are kept in a single relational database, defined by linking registers on the basis of personal identification numbers.

Risk factors will be identified by logistic regression on cross sectional data as well as longitudinal data. Important confounders may be identified.

Health care treatments will be evaluated by survival analysis.

Risk factors will be stratified according to risk groups.

7. References

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