

## THE EPIDEMIOLOGY OF SUICIDE ATTEMPTS IN EUROPE+

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#### ÖZET

Son 20-30 yıldır, ölümcül olmayan intihar davranışları bir çok ülkede büyüyen bir sorun olmuştur. Bir çok batı ülkesinde ölümle sonuçlanan intiharlar 100 yıldan daha uzun bir süredir kaydedilmektedir. Ancak intihar girişimlerine ait ulusal istatistikleri tutan hiçbir ülke yoktur. Bu nedenle Dünya Sağlık Örgütü (DSÖ) Avrupa Bölgesel Ofisi 1980'lerin ortalarında Avrupa ülkeleri arasında intihar girişimleri ile ilgili bir çalışma başlatmıştır. "DSÖ/Avrupa Çok Merkezli İntihar Davranışı Çalışması". Çalışmanın iki bölümü vardır: İzleme Çalışması ve Tekrarlanan İntihar Girişimlerindeki Risk Faktörlerinin Belirlenmesi Çalışması. İzleme Çalışması 1989'da başlatılmıştır. Başlangıçta çalışmaya 16 merkez katıldı. Ancak bunlardan bazıları bu konuya ayrılan ulusal kaynakların yetersizliği nedeniyle çalışmadan ayrılmak zorunda kaldı. Bununla beraber, yeni merkezler çalışmaya katılmak istediler. Bugün için çalışmanın İzleme Bölümü'nde 24 merkez yer almaktadır. 1989-1992 yılları arasında, 22.655 intihar girişimi bildirilmiştir. Avrupa'da yaşa göre standardize edilmiş intihar girişimi hızı erkeklerde 100.000'de 136 ve kadınlarda 100.000'de 186'dır. Erkeklerde en yüksek yaşa özel hız 25-34, kadınlarda ise 15-24 yaş gruplarında saptanmıştır. Bu dönem içinde erkeklerin intihar hızlarında % 17, kadınların intihar hızlarında ise % 14 düşüş olmuştur. Bununla birlikte bir çok merkez genç kadınlardaki intihar girişim-

lerinde endişe verici bir artış olduğunu bildirmektedir. Genel olarak en sık kullanılan intihar girişimi yöntemi ilaçla kendini zehirlemektir. Erkekler kadınlara göre daha saldırgan intihar yöntemlerini tercih etme eğilimindedirler.

**Anahtar Kelimeler:** İntihar, intihar girişimi, intihar davranışı, epidemiyoloji.

#### SUMMARY

During recent decades, non-fatal suicidal behaviour has become a problem of increasing concern in most countries. Contrary to fatal suicidal acts that most western countries have been registering for more than 100 years, no country can provide national statistics on suicide attempts. For this reason, the European Regional Office of the World Health Organisation initiated an inter-European study on suicide attempts in the mid-1980's. "The WHO/Euro Multicentre Study on Suicidal Behaviour". There are two parts of the study: The Monitoring Part and The Repetition Prediction Study. The Monitoring study started in 1989. Originally, 16 centres participated, but due to lack of national funding some had to leave the study. On the other hand, new centres have wanted to take part, and as of today, 24 centres are included in the monitoring part of the project. During the period of 1989-1992, 22,655 episodes of attempted suicide were reported, and age-standardised average rates per 100,000 in Europe were estimated to 136/100,000 for males and 186/100,000 for females. The highest age-specific rates for men were found among the 25-34 year-olds and for women among the 15-24 year-olds. There was a decrease during the period in the total rates of about 17% for men and 14% for

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women. Most centres are, however, expressing worries concerning markedly increasing frequencies of suicide attempts among the young girls. In general the far most common method is self-poisoning, usually with overdoses of medicine. There is a tendency towards men choosing more violent or determinant methods than women.

**Key Words:** Suicide, suicide attempt, suicidal behaviour, epidemiology.

**INTRODUCTION**

During recent decades, non-fatal suicidal behaviour has become a problem of increasing concern in most countries. Although there has been a marked development in the medical treatment after a suicidal act and therefore greater probabilities of saving and survival, the frequency of non-fatal suicidal acts has been increasing with an almost epidemic speed. It is therefore argued that the majority of these suicide attempts cannot be seen as 'unsuccessful suicides', but rather as a special 'new' type of suicidal behaviour that is not necessarily motivated by 'a wish to die', but which is aiming at provoking changes in problematic or painful situations so that life (again) will be worth living.

However, contrary to fatal suicidal acts that most western countries have been registering for more than 100 years, no country can provide national statistics on suicide attempts, and our knowledge of the frequency of attempted suicide,

of risk factors and high-risk groups, and of characteristics of suicide attempters has so far been based on results from various separate studies which have been difficult to compare and to draw general conclusions from because of differences in choice of method, case-finding criteria, etc.

For these reasons, the European Regional Office of the World Health Organization initiated an inter-European study on suicide attempts in the mid-1980's. The WHO/Euro Multicentre Study on Parasuicide (from 1998 on titled *The WHO/Euro Multicentre Study on Suicidal Behaviour*) was to cover two broad areas of research:

- \* *monitoring trends in the epidemiology of parasuicide, including identifying risk factors (the Monitoring Study); and*
- \* *conducting follow-up studies of parasuicide populations as a special high-risk group for further suicidal behavior (the Repetition-Prediction Study).*

The main topic of this article will be the methods of and some results from the Monitoring Study.

The Monitoring study started in 1989. Originally, 16 centres participated, but due to lack of national funding some had to leave the study. On the other hand, new centres have wanted to take part, and as of today, 24 centres are included in the monitoring part of the project.

Table 1. Status of centres participating in the WHO/Euro Multicentre Study on Suicidal Behaviour.

**Old centres**

- Bern, Switzerland
- Helsinki, Finland
- Innsbruck Stadt & Land, Austria
- Odense, Denmark
- Oxford, UK
- Padova, Italy
- Sør-Trøndelag, Norway
- Stockholm, Sweden
- Umeå, Sweden
- Würzburg, Germany
- Leiden, The Netherlands

**No more participating**

- Bordeaux, France
- Cergy-Pointoise, France
- Emilia Romagna, Italy
- Guipúzcoa, Spain
- Novi Sad, Yugoslavia
- Vilnius, Lithuania

**New Centres**

- Mamak, Turkey
- Athens, Greece
- Cork, Ireland
- Gent, Belgium
- Holon, Israel
- Limerick, Ireland
- Ljubljana, Slovenia
- Pecs, Hungary
- Rennes, France
- Tallinn, Estonia
- Riga, Latvia

**Applied for participation**

- Kiev, Ukraine
- Odessa, Ukraine
- Dresden City & Weisseritz County, Germany



Fig. 1. Map of Europe with participating centres.

Initially, four main purposes were listed for this part of the project:

- \* to assess feasibility of using local case registers to monitor attempted suicide in defined catchment areas. The catchment areas are supposed to cover at least 200.000 inhabitants (15 years and over)
- \* to estimate the true incidence of medically treated suicide attempters and trends over time, using standardized definitions and case-finding criteria
- \* to identify sociodemographic risk factors significantly associated with attempted suicide
- \* to ascertain variations in patterns of treatment following attempted suicide in different cultural contexts (with the aim of establishing more effective services for preventing this type of suicidal behaviour).

Already in the planning phase did it become clear that for several reasons existing local case registers could not provide sufficiently reliable data. A special monitoring of suicide attempts, using uniform monitoring forms and the same case finding criteria, was therefore to be carried out at all centres on consecutive episodes in all places where suicide attempters were seen and/or treated by health personnel. A suicide attempt was defined as:

*"an act with non-fatal outcome, in which an individual deliberately initiates a non-habitual behaviour that, if without intervention from others, will cause self-harm, or deliberately ingests a substance in excess of the prescribed or generally recognized therapeutic dosage, and which is aimed at realizing changes which the subject desires via the actual or expected physical consequences".*

The definition includes acts that are interrupted before the actual self-harm occurs (e.g. if a person is removed from the railway track before the train arrives), but excludes acts of self-harm by persons who do not understand the meaning or the consequences of their act (e.g. because of mental retardation or severe mental illness). This operational definition does not specify the strength of the wish to die, since this is almost impossible to ascertain. That is all intentional self-destructive behaviours are included, as long as these behaviours appear to be intended to bring

about changes in the present situation. For a discussion on the use of the terms parasuicide and attempted suicide, see Bille-Brahe et al. 1994.

All monitoring data are then transferred to the centre in Würzburg, where they are checked, coordinated and re-checked by prof. Armin Schmidtke and his co-workers.

To provide an adequate epidemiological description of the areas under study, each participating centre has been required to submit standardized information about the catchment area in question, including general background data such as the size and location of the area, the breakdown of the population according to age, sex and civil status, housing, urban/rural areas and unemployment rates, together with the main industrial and economic activities of the area. These pieces of background information have been gathered at the centre in Odense and published in the booklet "Facts & Figures" (Bille-Brahe (ed), 1999).

#### DATA ON ATTEMPTED SUICIDE IN EUROPE

Data from 15 centres for the first five-year period (1989-1993) were published in 1994 in the book *Attempted Suicide in Europe* (Kerkhof et al. 1994) and in an article *Attempted suicide in Europe: rates, trends and sociodemographic characteristics of suicide attempters during the period 1989-1992* (Schmidtke et al. 1996). In all 22.655 episodes of attempted suicide were reported, and age-standardized average rates per 100.000 in Europe were estimated to 136/100.000 for males and 186/100.000 for females. There was, however, huge differences between the various areas under study: for men it varied from 314/100.000 (in Helsinki) to 45/100.000 (in Guipúzcoa), and for women from 462/100.000 (in Cergy-Pontoise) to 69/100.000 (in Guipúzcoa). The highest age-specific rates for men were found among the 25-34 year-olds and for women among the 15-24 year-olds.

In general, there was a decrease during the period in the total rates of about 17% for men and 14% for women. It should be noted, however, that in four areas, namely Helsinki, Emilia Romagna, Cergy-Pontoise, and Würzburg total female rates had been increasing.

Table 2 gives an overview of the rates of attempted suicide in the various part of Europe up to 1995

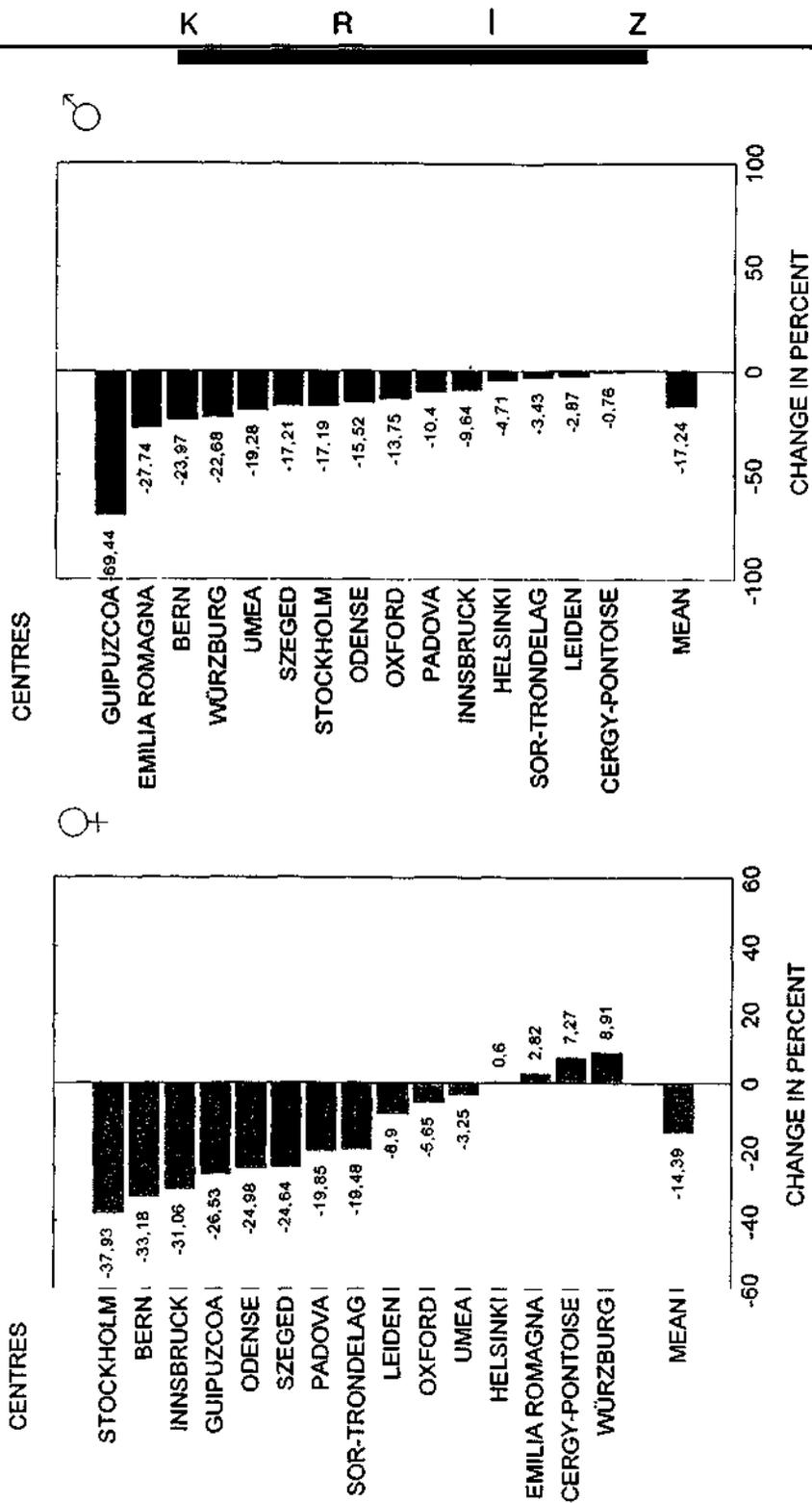


Fig. 2. Percentage changes in rates of attempted suicide (persons) by sex, 1989-1992 in 15 European areas under study (Bern 1989-1990, Cergy-Pontoise and Guipúzcoa 1989-1991).

Table 2. Rates of attempted suicide (events) per 100,000, 15 years and older, in the areas under study, 1989-1995.

	1989	1990	1991	1992	1993	1994	1995	Male/female ratio latest year
	M/F	M/F	M/F	M/F	M/F	M/F	M/F	
<b>Northern Europe</b>								
Helsinki, Finland	330/237	340/266	323/247	314/238	270/214	333/267	272/232	1.18
Odense, Denmark	188/233	175/200	152/173	159/175	167/205	145/185	124/177	0.70
Stockholm, Sweden	179/314	176/227	115/192	148/195	147/224	124/190	106/162	0.66
Sør-Trøndelag, Norway	147/210	145/210	151/177	142/169	113/163	118/112	92/117	0.79
Umeå, Sweden	94/148	104/145	92/143	77/144	61/120	54/103	61/97	0.63
<b>Mid-Western Europe</b>								
Bern, Switzerland	130/178	99/119	NA	NA	105/130	74/111	60/117	0.51
Cork, Ireland*							196/206	0.96
Limerick, Ireland*							202/209	0.97
Dresden City, Germany*								
Weisseritz County, Germany*								
Gent, Belgium*								
Innsbruck Stadt & Land, Austria	94/141	78/95	75/101	85/97	141/137	NA	NA	1.03
Oxford, England	277/384	273/363	271/364	239/363	261/310	311/376	NA	0.85
Leiden, The Netherlands	81/148	102/144	82/129	78/134	NA	NA	NA	0.59
Rennes, France*		370/540 <sup>1</sup>					380/544 <sup>2</sup>	
Würzburg, Germany	72/100	66/84	68/105	55/108	101/174	92/142	77/127	0.61
<b>Central Eastern Europe</b>								
Kiev, Ukraine*								
Ljubljana, Slovenia*							84/79	0.95
Novi Sad, Yugoslavia*								
Odessa, Ukraine*								
Pecs, Hungary*								
Riga, Latvia*								
Tallinn, Estonia*							278/188	1.48
Vilnius, Lithuania*								
<b>Southern Europe</b>								
Holon & Bat-Yam, Israel*								
Mamak, Turkey*								
Padua, Italy	71/117	55/90	55/93	63/94	45/82	28/66	51/86	0.60

\* Centres that just recently joined the WHO/EURO Multicentre Study on Parasuicide.

1 The figures are for the town of Rennes.

2 The figures are for the Catchment area.

In the publications mentioned above, an apparent increase in the sex ratio (m/f) was discussed. It is interesting to note that in 1995, there was an overweight of men attempting suicide in three of the 15 areas under study, namely Helsinki, Innsbruck, and Tallinn. Furthermore, in

the two Irish areas, and in Ljubljana the ratios are now getting close to 1.

Fig. 3 shows the latest data available on the frequency of attempted suicide. Data on the second five-year period 1993-1997 will be published shortly.

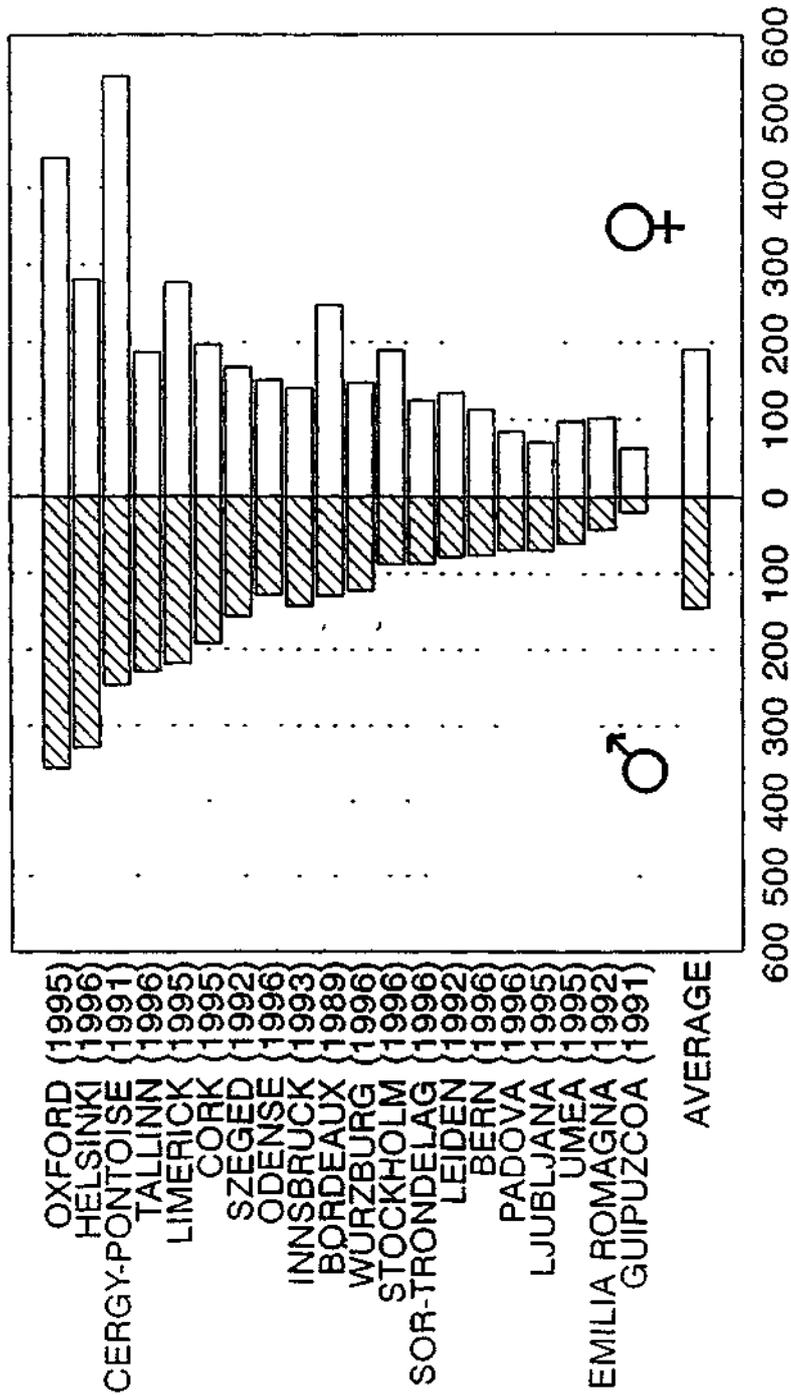


Fig. 3. Age-standardized rates of attempted suicide (events) per 100,000, 15 years and older. Latest available year (-1996).

The figures indicate that the rank-order of the areas under study (cf. tab. 1) is rather stable, and

tendency towards men choosing more violent or determinant methods than women.

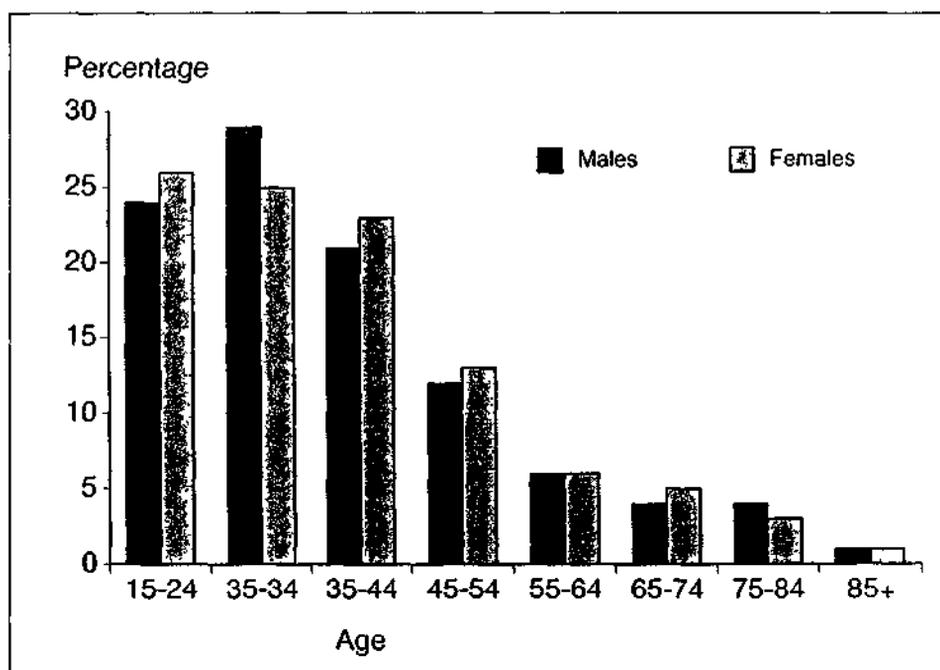


Fig. 4. The age distribution of suicide attempters, 1989-1993.

so is the distribution on age: in all areas the highest rates are to be found among the young.

Most centres are, however, expressing worries concerning markedly increasing frequencies of suicide attempts among the young girls. As yet, no pooled data on age-specific rates from the latest years are available, but as an illustration of the problem, Danish rates of attempted suicide for 15-19 year-olds and for persons 20 years and older are shown in fig. 5.

The figure shows that while rates of attempted suicide in Denmark have gone down for all age groups and for both sexes, during the 1990's the 15-19 year-old girls have almost tripled their rate.

The choice of method does differ between the areas, but in general the far most common method is self-poisoning, usually with overdoses of medicine. In particular, overdoses of various types of mild analgesics, especially Paracetamol agents, are very common among young girls. It can be seen from the figure, that there is a

## SOCIODEMOGRAPHIC CHARACTERISTICS

International literature is rich on studies on risk factors and groups with increased risk for suicidal behaviour, and there seems to be a general agreement as to the importance of at least some parameters concerning demography, social conditions, living standard, health, and alcohol consumption and crimes. For this reason, questions relating to such conditions were included in the monitoring form, and descriptions of the relevant parameters were included in the booklet *Facts & Figures*. Results from the first period of the Monitoring Study confirm the existence of co-variations of certain sociodemographic and socioeconomic conditions, and the occurrence of attempted suicide (Schmidtke et al. 1994) and it was expected that there would be correlations between the rates of attempted suicide in the areas under study, and the said characteristics of the areas.

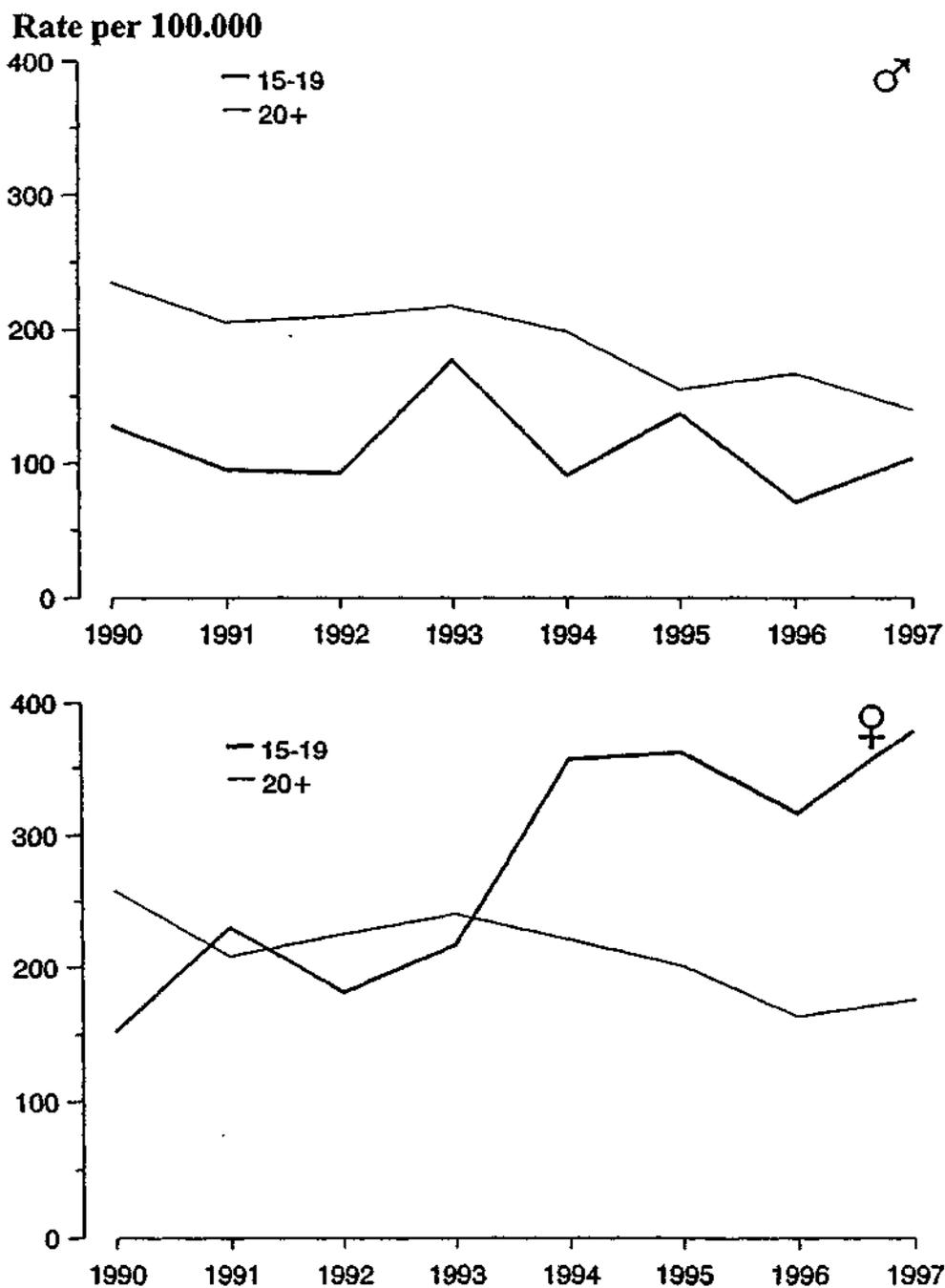


Fig. 5. Age and sex specific rates of attempted suicide (events) in Denmark, 1990-1997.

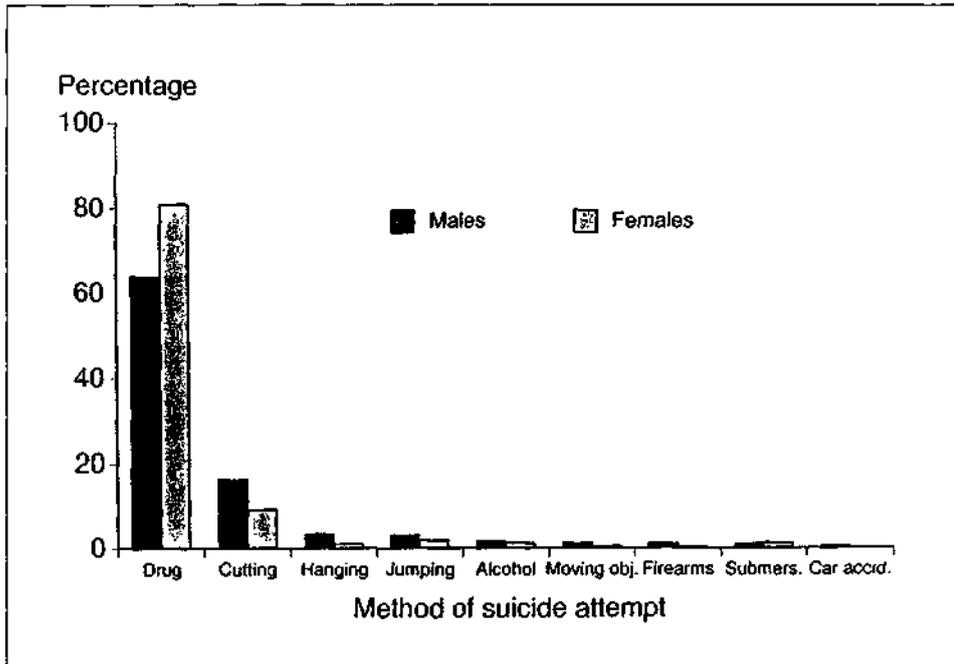


Fig. 6. Methods of suicide attempts (average percentages).

However, as can be seen from table 3, correlations significant on the 95% level were found regarding only two parameters, namely the frequency of divorce, and the number of people receiving public support (Bille-Brahe et al, 1996). Somewhat surprisingly, no correlations were found between e.g. unemployment or alcohol consumption, and the frequency of suicide attempts.

This raises the question and the need for further analyses: How then to explain the at times rather marked differences between the areas under study in the frequency of attempted suicide?

#### ATTEMPTED SUICIDE VERSUS COMPLETED SUICIDE

From fig. 7 it is seen that the rate of completed suicide varies markedly between the areas under study, too.

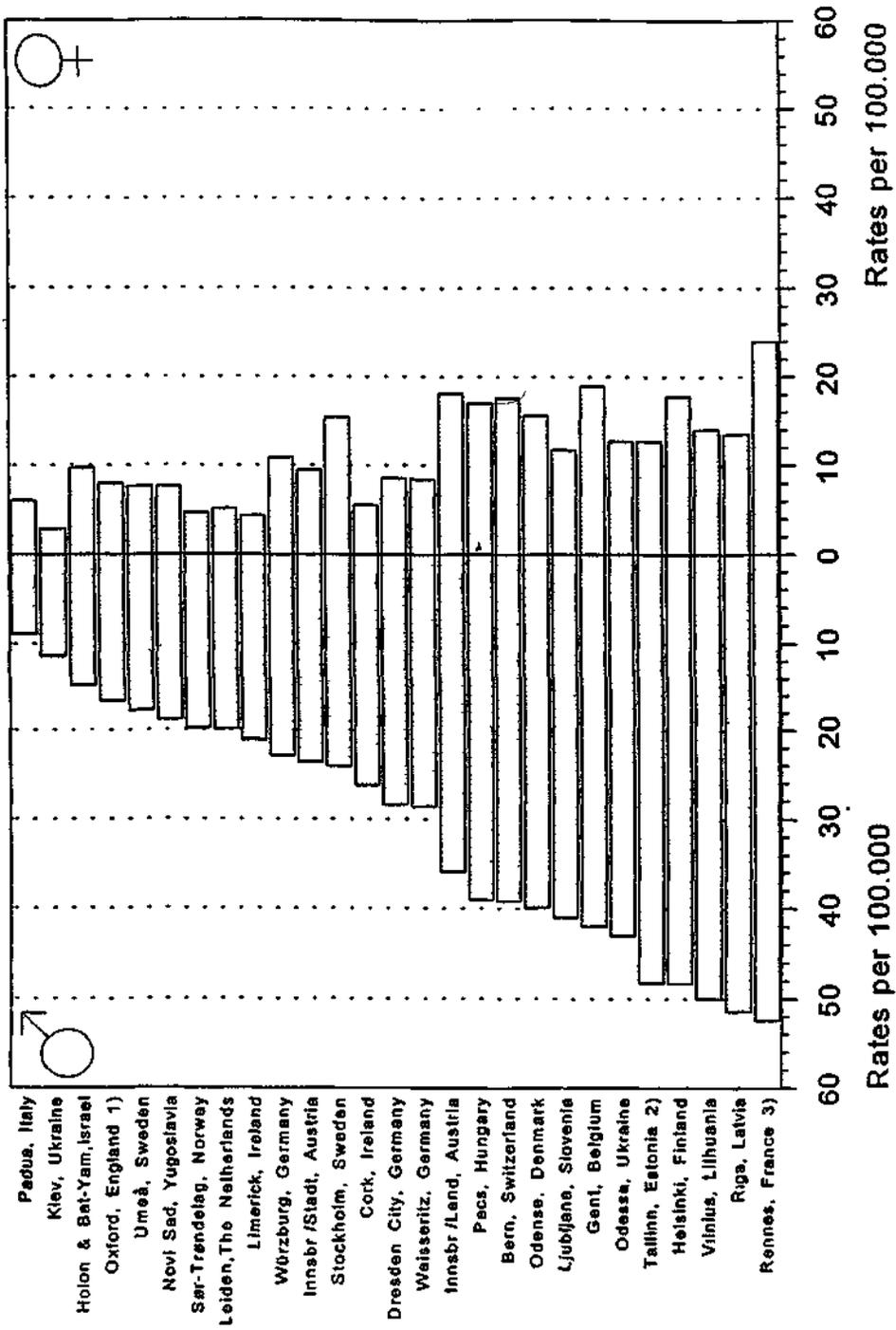
In literature, it is often stated that the frequency of suicide attempts is probably 8-10 times higher than that of completed suicides. This might be true when mean total rates are concerned, but in fact the statement is a gross simplification.

While the risk of completed suicide is highest among men and increasing with age, attempted suicides most often occur among young people and especially among young women. Accordingly, the ratio suicide attempts/suicide differs -as shown in fig. 8.- markedly with sex. That the variation is even bigger between age groups can be illustrated with another example from the Danish area under study: here the ratio varies from 91:0 for 15-19 year-old girls to 1:1 for men 60 years and older.

It is, however, interesting to note that the ratio attempted suicide/completed suicide, at least when it comes to mean or average rates, seems to be rather stable over the last many years. Considering the fact that the population of attempters and of suicides in many respects -as e.g. age and sex- differ significantly from each other (cf. Stengel, 1967), one may ask if there are some underlying factors or conditions that in some way influence *the propensity* to react to painful problems and sufferings with suicidal behaviour and that knowledge on such factors also may tribute to an explanation of the differences between the centres discussed above.

Table 3. Spearman's Rank correlations between rates of parasuicide and some characteristics of the areas under study.

	Correlation coeff.		Significance	
	M	F	M	F
<b>Demographic Characteristics</b>				
Average population density in area (N=15)	-0.0179	-0.0214	0.950	0.940
Urban/rural distribution (N=14)	0.4198	0.4901	0.135	0.075
Proportion working in agriculture, forestry and fishery (N=12)	0.1160	0.2496	0.720	0.434
Sex ratio (N=15)	0.1456	0.2695	0.605	0.331
Per cent of the population above 40 years of age (N=15)	0.2687	0.1226	0.333	0.663
<b>Social Parameters</b>				
Number of people per household (N=9)	-0.0924	0.0168	0.813	0.966
Single people in per cent of the total population (N=15)	-0.1883	-0.3031	0.501	0.272
Single parent families in per cent of all families (N=9)	0.5105	0.2762	0.160	0.472
Divorced in per cent of total population	0.8709	0.7593	0.000	0.004
<b>Indicators of Living Standard</b>				
Per capita income (N=11)	0.5455	0.4273	0.083	0.190
Percentage receiving public assistance (N=11)	0.6109	0.6834	0.002	0.020
Unemployment rate (N=12)	-0.2557	-0.2557	0.422	0.422
<b>Health Indicators</b>				
Life expectancy (N=13)	-0.3571	0.1209	0.231	0.694
Mortality rate per 100,000 per year (N=13)	-0.3967	-0.3251	0.180	0.278
Infant mortality per 1000 live births (N=12)	0.1828	0.1511	0.570	0.639
<b>Alcohol Consumption and Crime</b>				
Crimes per year per 1000 inhabitants (N=12)	0.4965	0.4755	0.101	0.118
Registered per capita alcohol consumption (N=15)	-0.2594	-0.3399	0.351	0.215
Estimated per capita alcohol consumption (N=15)	0.0794	-0.0631	0.779	0.823



1) Suicide + undetermined  
 2) Per total population (0+)  
 3) Data only available for the whole county (département)

Fig. 7. Rates of completed suicide per 100.000 inhab. 15 years and older in the areas under study, latest available data (1991 to 1997).

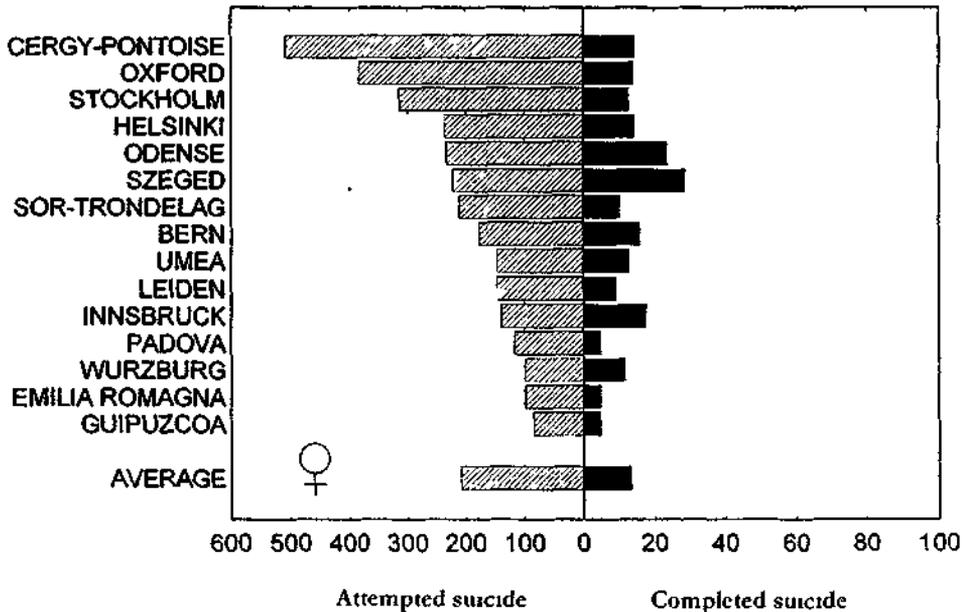
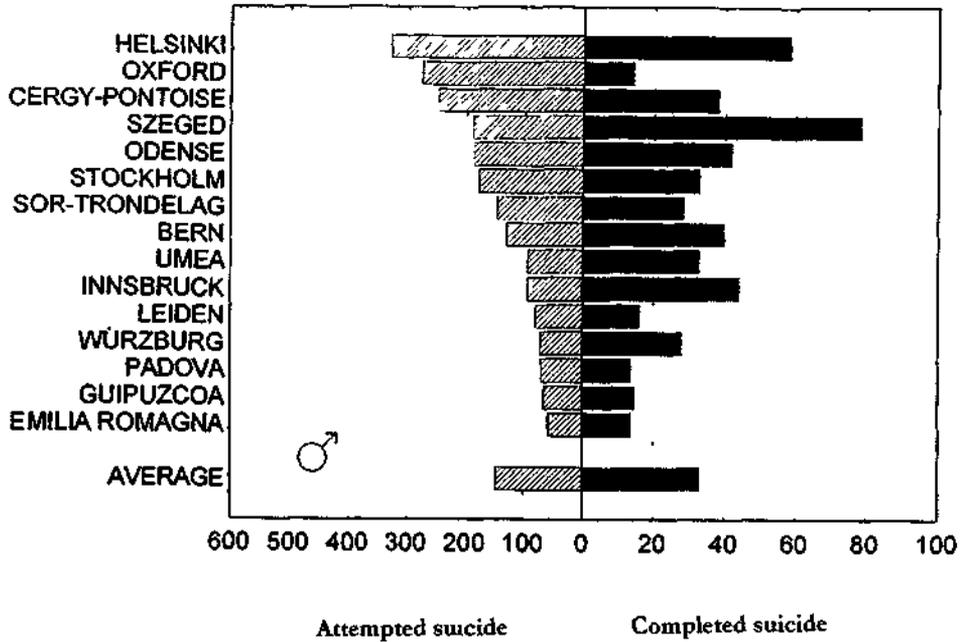


Fig 8 The ratio attempted suicide/completed suicide by sex.

## CONCLUDING REMARKS

During later years, the rates of completed suicide have been decreasing in most Western European countries, while the frequency has been increasing markedly in the Eastern and Central European Countries (Bille-Brahe, 1998). It is yet to be seen whether this pattern repeats itself regarding non-fatal suicidal acts but as more centres from the Eastern and Central part of Europe join the WHO/Euro Multicentre Study, the monitoring part of this project should be able to answer this question.

So far we can conclude that as far as attempted suicide is concerned, a decrease has

taken place in the majority of the Western European areas under study, but on the other hand we find that young people and especially young women are at an increasing risk. There is, however, a lack of correlations between known risk factors and the frequencies of attempted suicide, and this -and also the apparent stability of the ratio attempted suicide/completed suicide- raise questions that still remain to be answered. This calls for further analyses of our data and more research on e.g. factors that can be related to the societal structures in the various areas under study, to patterns in social networks, and to attitudes towards suicidal behaviour, bound in cultural and religious traditions.

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