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GRIFFITH UNIVERSITY



**Suicidal Behaviours at the Dawn of the New Millenium:  
On Their Nature, Magnitude, and Causality.**

**Professorial Lecture**

*By*

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President, International Association for Suicide Prevention*

*Delivered on  
Thursday 8<sup>th</sup> June, 2000  
5.30pm*

Andy Nimmo Theatre  
Mt Gravatt Campus, Griffith University

## **Preamble**

The 1998 World Health Report (1) indicates that throughout the world in 1997 an estimate of 835,000 persons died as a consequence of suicide. Therewith, the death toll of suicide equals and in many countries even exceeds that of road traffic accidents. In addition to the number of suicidal deaths, at least ten times as many persons make non-fatal attempts to take their lives or harm themselves, often seriously enough to require medical attention and not infrequently resulting in irreversible disability (2). But suicidal behaviour is not merely an act of violence against the individual self, and the above mentioned figures inadequately describe the magnitude of the human suffering that is caused by such an event. If one considers that for every suicidal death there are at least 5-6 persons on average whose lives are profoundly affected emotionally, socially, economically (and often for many years), then each year millions of survivors-victims are added to the tens of millions already "out there" (3). The amount of violence which is implicit in the above mentioned considerations is enormous. It directly goes back to the propositions of the early psychoanalytical thinkers who regarded suicide as a form of failed homicide, the turning of aggression against the self that was formerly directed against another person.

Suicidal behaviour constitutes one of the most common emergencies in psychiatry. However, its prediction and prevention still represent a very complex and puzzling clinical problem. It has been estimated that each physician, on average, may meet every year at least three seriously suicidal patients, whilst the number of people spontaneously referring suicidal ideation might be up to five times bigger. Actually, at least 50% of all subjects who die by suicide visit their general practitioner in the last weeks of their life, and in many cases they use the prescribed drugs to obtain their scope (4).

This lecture deals with the most relevant aspects of suicidal behaviour at the dawn of the new millennium: problems with existing definitions and the need for standardised nomenclatures, international epidemiology of mortality and morbidity (non-fatal suicidal behaviour and ideation), its presently most accredited causality.

## On the Nature of Suicide

The term "suicide" in itself evokes direct reference to violence and aggressiveness. Apparently, Sir Thomas Browne was the first to coin the neologism "suicide" in his *Religio Medici* (1642). A physician and a philosopher, Browne founded his choice on the Latin *sui* (of oneself) and *caedes* (murder) and the appearance of the new term reflected a desire to distinguish between the homicide of oneself and the killing of another (5). In fact, the original meaning of "self-murder" is still a popular choice to designate suicide in some northern European countries (such as Germany, where "selbstmord" is certainly used more than "suicide").

A commonly used definition of suicide is the one reported by Shneidman in the 1973 edition of the Encyclopaedia Britannica : "*Human act of intentionally self-inflicting own's life cessation*" (6). Based on that (the basic principle of the *mors voluntaris*), intention to die should be the key-issue in the attribution of a cause of death to suicide. However, the reconstruction of the actual determination of a person is often too arbitrary and this interpretive approach has demonstrated unrecoverable problems both at the coronial and the clinical levels. This is due to the imperfect correlation between intent and outcome. Not all the subjects who survive a suicidal act intended to live, not all suicidal deaths were planned.

Today, the endorsement of the evidence-based perspective in public health has promoted a moving from the interpretive investigation to an outcome-based practise that created the ground for a shift in the use of terminology. Consequently, "fatal suicidal behaviour" is proposed for those suicidal acts that result in death, while "non-fatal suicidal behaviour" refers to suicidal behaviour that does not result in the person's death (7). The intention to die is not always a necessary criterion, but the actor should be aware that the action he/she initiates may cause death. Interestingly, this new approach seems to be closer to the old definition of Durkheim ("*all those death cases directly or indirectly resulting from a positive or negative act of the victim, who is aware of the consequences of its behaviour*") (8) than to the one of Shneidman (Tab. 1).

**Table 1 - Definitions in Suicidology**

**Fatal Suicidal Behaviour**

***Definition:***

- fatal outcome
- actor aware that action he/she initiates may cause death

***Considerations:***

- intent to die not always necessary
- death short-term effect of action
- inclusion/exclusion criteria
  - ~ inclusion: ie, “command” hallucinations, terrorist sacrifice, etc
  - ~ exclusion: ie, “megalomaniac delusions”

**Non-Fatal Suicidal Behaviour**

***Definition:***

- non-fatal outcome
- actor aware that action he/she initiates may, potentially, cause death

***Considerations:***

- intent to die not necessary
- non-habitual behaviour
- consequences as short-term effect of action
- inclusion/exclusion criteria
  - ~ inclusion: ie, being removed by another person from the railway track
  - ~ exclusion: ie, self-mutilation, drug abuse

“Non-fatal suicidal behaviour” may overcome the long-lasting debate among definitions of “attempted suicide”, “parasuicide”, “deliberate self-harm”, which are terms used in the USA, the WHO European office and the UK respectively. “Parasuicide” was chosen in the context of the WHO/EURO Multicentre Study (9), to designate -for research purposes- every suicidal act regardless of the evaluation of the intentionality involved. Its use was proposed as interchangeable with that of attempted suicide. However, “parasuicide” is a term not easily translated in many languages. Furthermore, the prefix “para” emphasises the aspects too much of mimicry and simulation.

The bottom line is that in clinical practice "parasuicide" is often used to define attempts with low intention to die, whilst "attempted suicide" is frequently proposed to designate acts with strong intention. On the other hand, countries of the British Commonwealth up to now have been quite reluctant to quit the definition of "deliberate self-harm" which, in the words of Kreitman (10), "...neglects the very real association that exists between attempted suicide and completed suicide".

Suicidal ideation, *strictu sensu*, should refer to all those thoughts featuring, with varying degrees of intensity and elaboration, the active killing of one's self. However, the available literature on the topic contemplates in once the mentioned ideas but also feelings of tiredness for life, that life is not worth living and the wish for not waking up from sleep. Although these different ideations also express a different level of severity, this does not imply any particular *continuum* among them. Being suicidal ideation, in this broad sense, a very common experience, and given its mostly transient presentation, its relationship with actual suicidal behaviour needs to be further investigated.

Another common form of self-directed violence is self-mutilation. This represents the direct and deliberate destruction or alteration of parts of the body without any conscious suicidal intentionality. Favazza (11) proposes three main categories: major self-mutilation (self-blinding, amputations of fingers, hands, arms, limbs, feet, genitalia, etc); stereotypic self-mutilation (head banging, self-biting, arm hitting, throat and eye gouging, scratching, hair pulling, etc); superficial-to-moderate self-mutilation (skin cutting, scratching and burning, needle sticking, compulsive hair pulling). Self-mutilation involves very different meanings from suicidal behaviours, which are the main focus of this chapter, and will not be discussed further. However, for an extensive review of these practices, see for example Favazza (11).

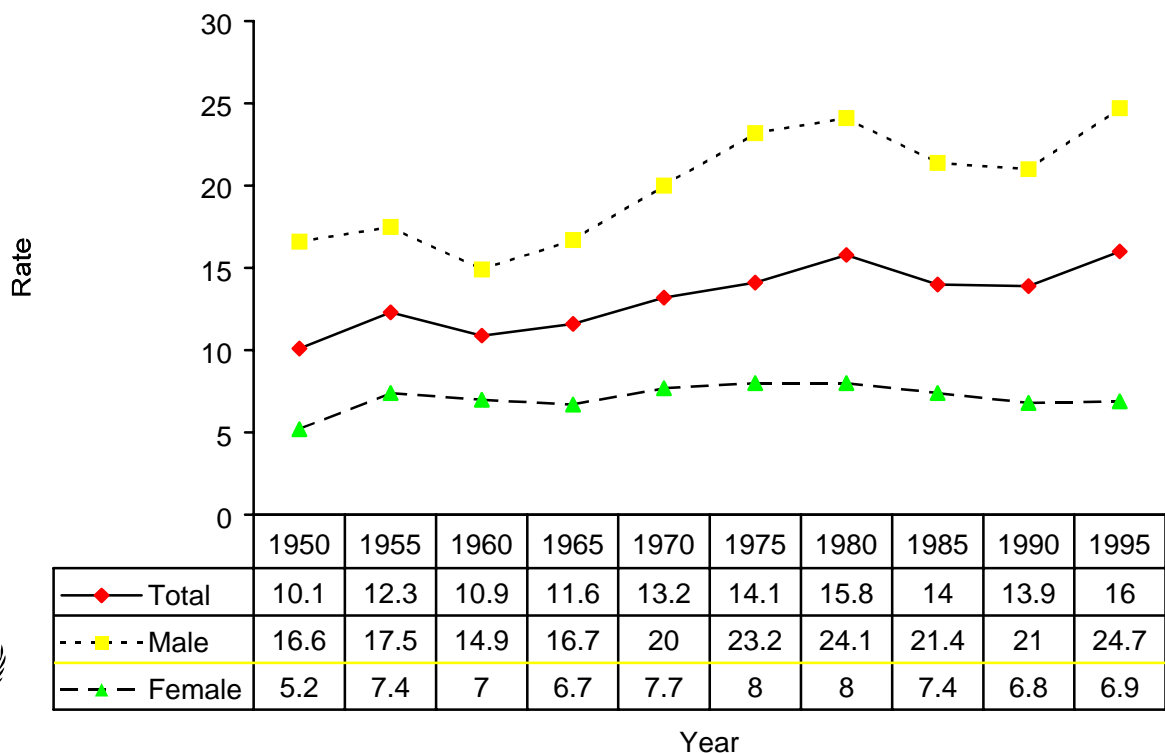
## **On the Magnitude of Suicidal Behaviours**

### **1. Mortality data**

It has been estimated that in the year 2000 approximately one million people will die by suicide, worldwide (12). This represents a global mortality rate of about 16 per 100,000 or one death every 40 seconds (13). Suicide is estimated to represent 2.4% of the total burden of disease in countries with market and former socialist economies in 2020, with an expected amount of deaths of over 1,500,000.

On a global basis, suicide rates have increased by 60% in the last 45 years (see Figure 1) and suicide is now among the three leading causes of death among those aged 15-44 years, of both sexes. The increase in these global suicide rates must be interpreted with caution. On the one hand, figures for 1950 were based on 21 countries only, and this gradually increased up to 1995, when the estimates are based on 105 countries now reporting on causes of death. These 105 countries as a whole probably have higher rates, are more concerned with them and have a higher tendency to report on suicide mortality than countries where suicide is not perceived as a major public health problem. On the other hand, it might also reflect the fact that since the end of the USSR (which had an overall rate below the average), some of its former Republics (particularly those with the highest rates in the world), started to report individually, thus inflating the global rate (tab. 2).

**Figure 1 - Global suicide rates (per 100.000), by gender, 1950-1995.**



**Table 2 - Suicide Rates** (per 100.000)  
( most recent year available, as of August 1999)

<b>Country</b>	<b>Year</b>	<b>Males</b>	<b>Females</b>
Albania	1993	2.9	1.7
Antigua and Barbuda	1995	0	0
Argentina	1993	10.6	2.9
Armenia	1992	3.6	1.0
Australia	1995	19.0	5.1
Austria	1997	30.0	10.0
Azerbaijan	1996	1.5	0.3
Bahamas	1995	2.2	0
Bahrain	1988	4.9	0.5
Barbados	1995	9.5	3.7
Belarus	1993	48.7	9.6
Belgium	1992	26.7	11.0
Belize	1995	12.0	0.9
Brazil	1992	5.6	1.6
Bulgaria	1994	25.3	9.7
Canada	1995	21.5	5.4
Chile	1994	10.2	1.4
China (mainland)	1994	14.3	17.9
China (SAR Hong Kong)	1996	15.9	9.1
Colombia	1994	5.5	1.5
Costa Rica	1994	8.0	1.8
Croatia	1996	34.2	11.3
Cuba	1995	25.6	14.9
Czech Republic	1996	24.0	6.8
Denmark	1996	24.3	9.8
Dominican Republic	1994	0	0
Ecuador	1995	6.4	3.2
Egypt	1987	0.1	0
El Salvador	1990	15.6	7.7
Estonia	1996	64.3	14.1
Finland	1996	38.7	10.7
France	1995	30.4	10.8
Georgia	1990	5.4	2.0
Germany	1997	22.1	8.1
Greece	1996	5.7	1.2
Guatemala	1984	0.9	0.1
Guyana	1994	14.6	6.5
Honduras	1978	0	0



**Table 2 - Suicide Rates (per 100.000)**  
( most recent year available, as of August 1999)

<b>Country</b>	<b>Year</b>	<b>Males</b>	<b>Females</b>
Hungary	1997	49.2	15.6
Iceland	1995	16.4	3.8
India	1995	11.4	8.0
Iran	1991	0.3	0.1
Ireland	1995	17.9	4.6
Israel	1996	8.2	2.6
Italy	1993	12.7	4.0
Jamaica	1985	0.5	0.2
Japan	1996	24.3	11.5
Jordan	1979	0	0
Kazakhstan	1996	51.9	9.5
Kuwait	1994	1.8	1.9
Kyrgyzstan	1996	17.6	3.8
Latvia	1998	59.5	11.8
Lithuania	1998	73.7	13.7
Luxembourg	1997	29.0	9.8
Malta	1997	5.9	2.1
Mauritius	1996	20.6	6.4
Mexico	1995	5.4	1.0
Netherlands	1995	13.1	6.5
New Zealand	1994	23.6	5.8
Nicaragua	1994	4.7	2.2
Norway	1995	19.1	6.2
Panama	1987	5.6	1.9
Paraguay	1994	3.4	1.2
Peru	1989	0.6	0.4
Philippines	1993	2.5	1.7
Poland	1996	24.1	4.6
Portugal	1996	10.3	3.1
Puerto Rico	1992	16.1	1.9
Republic of Korea	1995	14.5	6.7
Republic of Moldova	1996	30.9	6.2
Romania	1996	21.1	4.3
Russian Federation	1995	72.9	13.7
Saint Kitts and Nevis	1995	0	0
Saint Lucia	1986-88	11.0	3.0
St. Vincent and The Grenadines	1982-85	2.0	0
Sao Tome and Principe	1987	0	1.8

**Table 2 - Suicide Rates** (per 100.000)  
( most recent year available, as of August 1999)

<b>Country</b>	<b>Year</b>	<b>Males</b>	<b>Females</b>
Seychelles	1985-87	12.2	0
Singapore	1997	14.3	8.0
Slovenia	1996	48.0	13.9
Spain	1995	12.5	3.7
Sri Lanka	1991	44.6	16.8
Suriname	1992	16.6	7.2
Sweden	1996	20.0	8.5
Switzerland	1994	30.9	12.2
Syrian Arab Republic	1985	0.2	0
Tajikistan	1992	5.1	2.3
Thailand	1994	5.6	2.4
Trinidad and Tobago	1994	17.4	5.0
Turkmenistan	1994	8.1	3.4
Ukraine	1992	38.2	9.2
United Kingdom	1997	11.0	3.2
United States of America	1996	19.3	4.4
Uruguay	1990	16.6	4.2
Uzbekistan	1993	9.3	3.2
Venezuela	1994	8.3	1.9
Yugoslavia	1990	21.6	9.2
Zimbabwe	1990	10.6	5.2

Suicide mortality data usually carries an underestimation of their real number. Many different issues contribute to this. Suicide data are the end result of a chain of informants which involves those finding the body (eg, family members), doctors, police, coroners and statisticians. Any of these may for a variety of reasons be reluctant to call a death a suicide. For example, a suicide may be voluntarily hidden to avoid stigmatisation, for social convenience, for political reasons, to benefit from insurance policies, or because it was masked as an accident (eg, a road accident). Suicide can also be misclassified as undetermined cause of death, or as natural cause (for example when people neglect to take life-sustaining medicaments). Suicide can go officially unrecognized as such when people overdose as drug-abusers, as are in self-starvation situations (so called “suicidal erosions”), when people die some time after their suicide attempt (in these cases usually it is the clinical cause of death which is the one officially reported), or in case of euthanasia or assisted suicide. The probability of under-reporting grows with age and it appears that the extent of that may be around 20-25% in

elderly people (in young people it is considered to be between 6-12-% of cases). A recent survey on suicide coding reliability of 20 western countries demonstrated percentages of sensitivity of suicide certification ranging from 89.6% (Austria) to 51.7% (Greece)(14).

Direct comparison of data from different countries and their ranking with regard to suicide mortality rates are attractive topics for researchers and media professionals. However, a number of considerations should be made regarding this. First of all, the recording of mortality procedure varies greatly amongst countries, seriously affecting comparability; even in those countries which adopt standardised criteria, the application of these criteria may vary considerably. At the national level, a frequently used way to partly overcome this issue is to make a comparison of trends of suicide rates with those for undetermined causes of death. A WHO Working Group on Suicide Prevention Practices (15) advised on the appropriate use of national statistics only for trend analyses.

If reported rates refer to small populations (as in case of cities, provinces, etc.) their interpretation requires extra caution, since just a few deaths may greatly influence their representation. Normally, populations under 250,000 should always be described with their crude number of suicides, to allow a correct reading. Furthermore, increasingly rates are reported as “age standardised”. This can refer to the exclusion of people under the age of 15 (generally because of their small number of fatalities – but in many countries their dimension is alarmingly increasing), but also the changing composition of the general population, especially with regards to the larger proportion of elderly people compared to the previous decades.

With regards to methods used in fatal suicidal behaviour, hanging is the preferred method at any latitude, followed by firearm, jumping from a height, and drowning. The USA represents a relevant exception to this, the firearm being the method of choice in nearly 60% of cases (2). Nearly everywhere, women tend to utilize more “soft” methods (eg, overdosing with medicines), both in fatal and non-fatal suicidal behaviours (16). A well-known exception is self-burning in India.

The choice of method is influenced by several factors (eg tradition, imitation, degree of intention, place of residence). Certainly, means availability plays a major role. In eastern European countries herbicides and pesticides are very frequently adopted for suicidal purposes, but the same holds true for the Pacific islands of Samoa, where the control of the sale of paraquat, a

herbicide, concurred to an actual decrease in the number of deaths due to suicide (17). In rural communities of Australia the use of firearms is far more common than hanging (18).

## 2. Morbidity data

### *Non-Fatal Suicidal Behaviour*

There are no reliable national data concerning non-fatal suicidal behaviour. The main reason for that resides in the difficulty of collecting information. Only a minority of attempters present to health facilities for medical attention. It has been calculated that, on average, only about 25% of subjects with suicidal acts make contact with public hospitals (which may represent the easiest source for data collection) (19) and they do not necessarily represent the most serious ones. This aspect is known as "tip of the iceberg phenomenon", underlining that the large majority of suicidal people remains unnoticed. Several institutions, like national centres for injury control and prevention or department of statistics (and of justice, in several countries) keep records of these non-fatal events that are registered at health services. They represent useful data for research and preventative efforts, since suicide attempters constitute a high risk group for subsequent suicidal behaviour, both fatal and non-fatal.

The European Office of WHO promoted a research project on non-fatal suicidal behaviour (WHO/EURO Multicentre Study of Suicidal Behaviour) which started in 1989 in 16 European centres, representing 13 countries. This collaborative investigation, which is still ongoing, involves today 25 centres and provides good quality data on suicide attempters recruited at the health facilities of well defined catchment areas. It can constitute a reliable source of information concerning attempters seen in public hospitals. For the period 1989-1992 (16) the highest average male age-standardised rate of suicide attempts was found for Helsinki, Finland (314/100,000), and the lowest rate (45/100,000) was for Guipuzcoa, Spain, representing a seven-fold difference. The highest average female age-standardised rate was found for Cergy-Pontoise, France (462/100,000), and the lowest (69/100,000) again for Guipuzcoa. With only one exception (Helsinki), the person-based suicide attempt rates were higher amongst women than amongst men. In the majority of centres, the highest person-based rates were found in the younger age groups. The rates amongst people aged 55 years and over were generally the lowest. The methods used were largely poisoning and then cutting. More than 50% of the suicide attempters made more than one attempt, and nearly

20% of the second attempts were made within 12 months after the first attempt. Compared with the general population, suicide attempters more often belong to the social categories associated with social destabilization and poverty.

### *Suicidal Ideation*

The presence of suicidal ideation in the general population appears to be quite common. However, its exact dimension is still unclear. For example a review of studies published after 1985 on community surveys in adolescent populations (particularly high-school students) evidenced values between 3.5% and 52.1% (20). Generally speaking, the great differences existing in these percentages may be explained by the different definition used of suicidal ideation and with the different time intervals to which the study referred. Some investigations, for example, presented data on recent suicidal thoughts. Other studies concerned suicidal ideation in the previous year. Some other studies investigated the presence of suicidal thoughts in the past or at least once in the past. Not surprisingly, the longer the retrospective examination, the greater the percentage of referred suicidal thoughts. However, quite clearly suicidal ideation constitutes a common phenomenon in adolescence and there is evidence of a higher percentage of suicidal thoughts in female subjects. This higher percentage of suicidal ideation in women is maintained also in old age where prevalence studies have reported the presence of suicidal ideation (in both sexes) in percentages comprised between 2.3% (last two weeks) up to 17% (life-time).

### **On the Causality of Suicidal Behaviours**

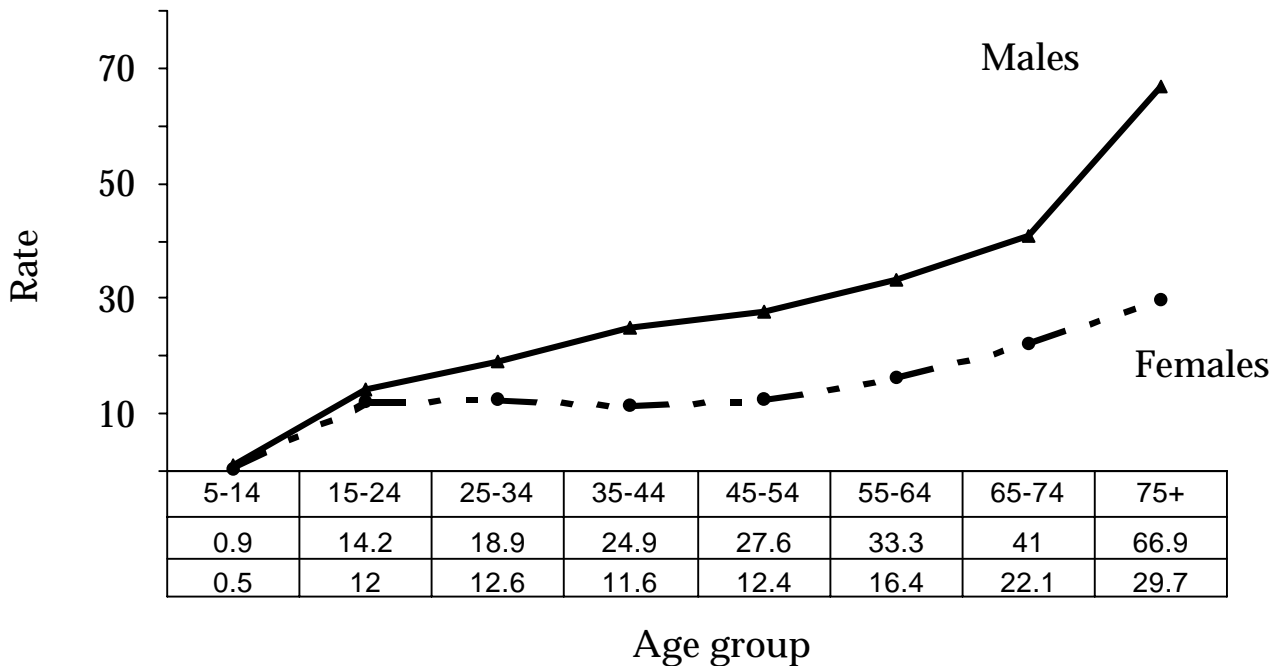
Suicidal behaviour is a multidetermined phenomenon. Researchers and clinicians should pay careful attention to the identification of every possible contributory factor in order to facilitate prediction of subsequent suicidal acts. However, present knowledge does not yet allow satisfactory prevention.

Suicide risk factors most of the time are interactive and interdependent. They represent predisposing conditions that may greatly vary according to the population considered; for example, gender distribution of suicide in schizophrenic patients is reported to be much closer than the one in the general population, disproportionately higher in male subjects (21).

**Age:** Globally speaking, there is a tendency for suicide rates to increase with

age (see Figure 2). For instance, as recently as 1995, starting from 0.9 per 100,000 in the age group 5-14 years old, suicide rates gradually increased up to 66.9 per 100,000, in the age group 75+ years (in general, with rates approximately three times higher than those of youth). This continuous, growing trend is observed for both sexes, although steeper for males.

**Figure 2 - Global suicide rates (per 100.000), by gender and age, selected countries, 1995**



Although traditionally suicide rates have been highest among the male elderly (in 1990 there was only one country -Poland- in which the rate in males aged 75 and over was not the highest), rates among young people have been increasing to such an extent in the last few decades that they are now the group at highest risk in a third of countries, in both developed and developing countries (see Table 3 and Figure 3). Concomitantly, an important decrease in suicide rates of elderly people has taken place, especially in Anglosaxon countries. For example, in Australia and in New Zealand a strong reduction in the ratio elderly/youth suicide has been observed, whilst the contrary happened in Asia (22) (Tab. 4 and Fig. 4).

**Table 3 Countries with Most Recent Youth (15-34) Suicide Rates Higher or Equal to Those of Elderly (65+)**

<b>Albania</b>	<b>1993</b>	<b>Malta</b>	<b>1994</b>
<b>Australia</b>	<b>1994</b>	<b>Mauritius</b>	<b>1995</b>
<b>Bahamas</b>	<b>1995</b>	<b>New Zealand</b>	<b>1993</b>
<b>Bahrain</b>	<b>1988</b>	<b>Nicaragua</b>	<b>1995</b>
<b>Barbados</b>	<b>1995</b>	<b>Northern Ireland</b>	<b>1995</b>
<b>Belize</b>	<b>1995</b>	<b>Norway</b>	<b>1994</b>
<b>Canada</b>	<b>1995</b>	<b>Panama</b>	<b>1985</b>
<b>Colombia</b>	<b>1994</b>	<b>Peru</b>	<b>1989</b>
<b>Ecuador</b>	<b>1995</b>	<b>Philippines</b>	<b>1975</b>
<b>El Salvador</b>	<b>1990</b>	<b>Russian Federation</b>	<b>1995</b>
<b>England/Wales</b>	<b>1995</b>	<b>Sao Tome &amp; Principe</b>	<b>1984-1985</b>
<b>Finland</b>	<b>1995</b>	<b>Scotland</b>	<b>1995</b>
<b>Guyana</b>	<b>1994</b>	<b>Seychelles</b>	<b>1985-1987</b>
<b>Ireland</b>	<b>1993</b>	<b>Sri Lanka</b>	<b>1985</b>
<b>Jamaica</b>	<b>1985</b>	<b>Suriname</b>	<b>1992</b>
<b>Kuwait</b>	<b>1994</b>	<b>Thailand</b>	<b>1980</b>

**From Bertolote (1999)**

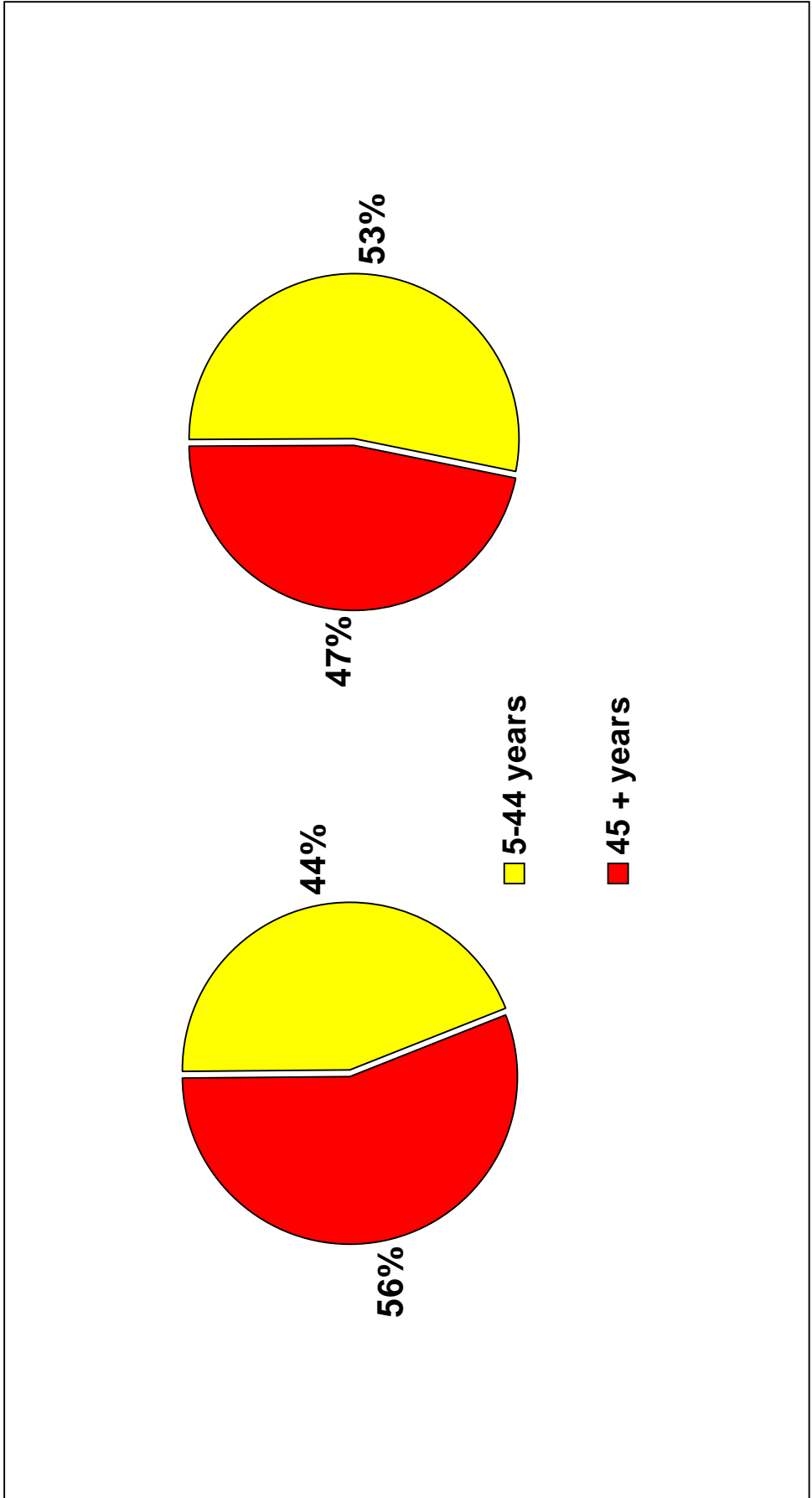
**Percentage of suicides by age group and gender, selected countries\***, (most recent year available for each country).

Age (years)	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75+	Total
Males	0.7	12.7	18.3	20.5	17	13.9	9.6	7.3	100
Females	0.9	13.3	15	15.4	14.7	13.9	13.7	13.1	100
All	0.8	12.8	17.5	19.2	16.4	13.9	10.7	8.7	100

\* Does not include India.

(WHO, 1999)

**Figure 3 - Percentage of suicides by age, selected countries, 1950-1995**

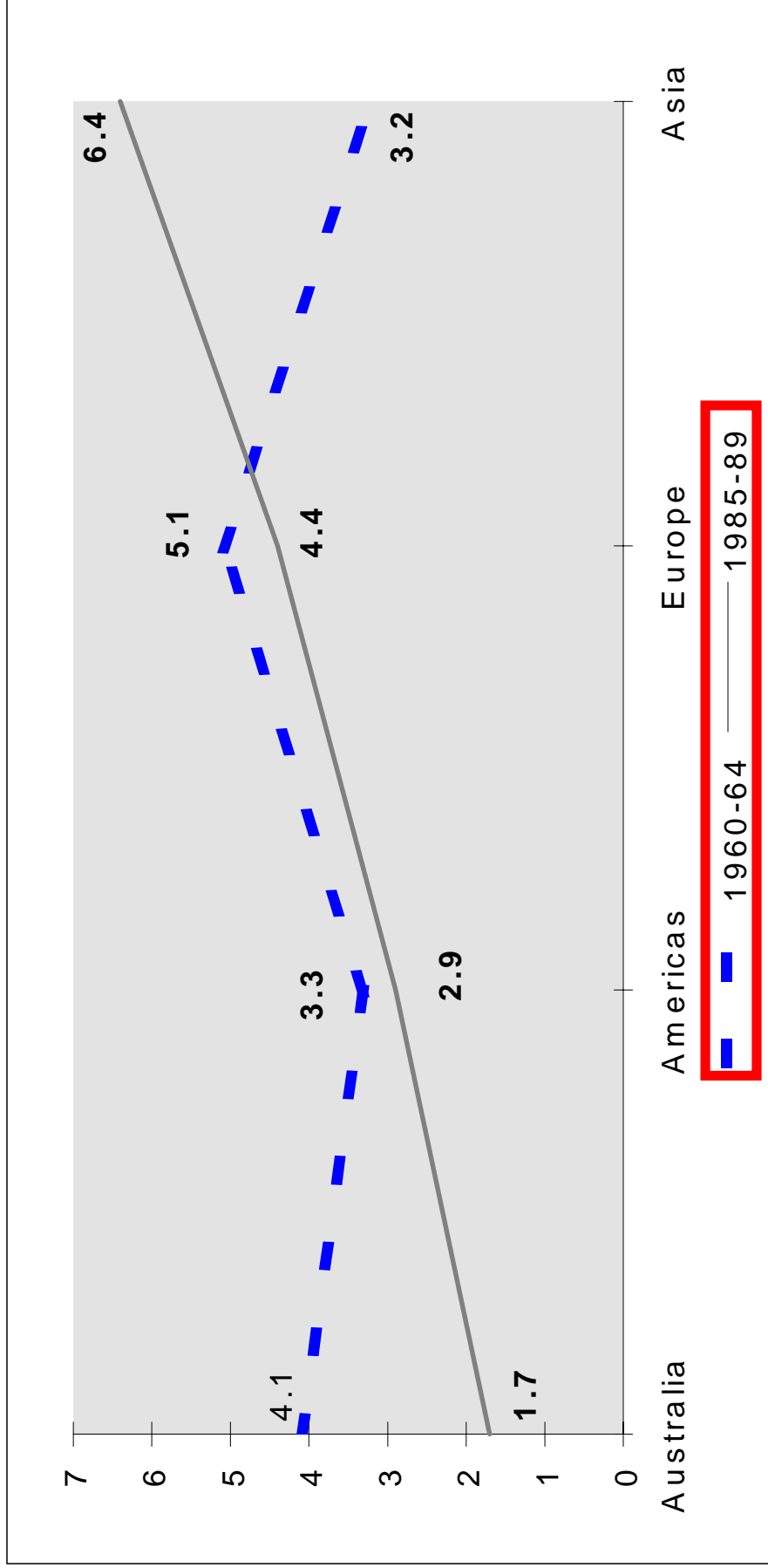




**Table 4 - Reordering of mean elderly:youth suicide ratios for 23 Western Countries by gender, 1990-1994 (for latest available years)**

Rank	Males			Females		
	Country	Elderly:Youth	Country	Elderly:Youth	Country	Elderly:Youth
1st	Portugal	10.2:1	Hungary	10.9:1		
2nd	Hungary	9.1:1	Denmark	9.2:1		
3rd	Italy	7.3:1	Germany	7.5:1		
4th	Spain	6.8:1	Spain	7.0:1		
5th	France	6.7:1	France	5.6:1		
6th	Belgium	6.3:1	Portugal	5.5:1		
7th	Germany	6.2:1	Italy	5.2:1		
8th	Denmark	5.8:1	Greece	4.9:1		
9th	Austria	4.9:1	Belgium	4.7:1		
10th	Greece	4.0:1	Austria	4.6:1		
11th	Sweden	3.9:1	Switzerland	4.0:1		
12th	Netherlands	3.8:1	Netherlands	3.3:1		
13th	Switzerland	3.5:1	England & Wales	2.8:1		
14th	USA	2.5:1	Sweden	2.4:1		
15th	Finland	1.7:1	Norway	1.7:1		
16th	England & Wales	1.5:1	<b>Australia</b>	<b>1.6:1</b>		
17th	<b>Australia</b>	<b>1.3:1</b>	Scotland	1.6:1		
18th	Norway	1.3:1	USA	1.6:1		
19th	Canada	1.1:1	Finland	1.3:1		
20th	Ireland	0.8:1	Ireland	1.2:1		
21st	Northern Ireland	0.8:1	Canada	1.0:1		
22nd	New Zealand	0.8:1	Northern Ireland	1.0:1		
23rd	Scotland	0.8:1	New Zealand	0.7:1		

**Figure 4. Medians of old/young ratios (75+/15-24y) of suicide rates in four continents (male)**



The reasons for the increase in rates of youth and a decline in those of older adults remain unclear: the elderly were not the special target of any national preventative program, but they only benefited from the general improvement in health care and living conditions that affected the general population as a whole. Furthermore, especially in western countries, some managed care interventions such as the reduction of hospital beds and stays could have an adverse impact on suicide rates, especially in old age.

Conversely, non-fatal suicidal behaviour appear to be, both in absolute and relative numbers, far higher in younger people. It is estimated that the ratio fatal versus non-fatal suicidal behaviour in old age may be of the order of 1 to 2-3, while in the youngsters this may reach the level of 1 to 100-200. Although suicidal behaviour is less frequent in the elderly, the probability of a fatal outcome is much higher (23). On average, suicide attempts in old age are, in psychological and medical terms, more serious, and the “failure” of a suicidal action is often due to unpredictable and fortuitous circumstances. Non-fatal suicidal behaviour in the elderly then frequently envisages a “failed suicide”. Compared to the youngsters, old age people appear more determined to die, as it is evident from the notes they leave or from the chosen methods, which are generally more violent.

**Gender:** In terms of sex distribution, suicide predominates among men: between 1950 and 1995 the males: females ratio varied from 3.2:1 to 3.6:1. The only exception to this predominance is observed in rural China, where the ratio males:females is 0.8:1. However, the ratio males/females seems rather influenced by the cultural context, going from 1.3 to 1 of India to more than 5 to 1 in several of the former Soviet Union countries, up to 8 to 1 in Puerto Rico. On average, it seems that men commit suicide circa 3 times more frequently than women, with substantial consistency throughout different periods of life, with the exception of extreme advanced age in which men tend to present even higher rates (Tab. 5). Conversely, as a general trend, non-fatal suicidal behaviour tends to be 2-3 times higher in women than in men. Finland, as already mentioned, represent a remarkable exception to that.

**Table 5 - Rank ordering of mean elderly suicide ratios for 23 Western countries by gender, 1990-1994 (for latest available years)**

Rank	65-74		75+	
	Country	M:F ratio	Country	M:F ratio
1st	USA	5.0:1	USA	9.2:1
2nd	Portugal	3.7:1	Finland	7.5:1
3rd	<b>Australia</b>	<b>3.7:1</b>	New Zealand	6.9:1
4th	Canada	3.6:1	Canada	6.1:1
5th	Greece	3.6:1	Northern Ireland	5.3:1
6th	Finland	3.5:1	Portugal	4.8:1
7th	Austria	3.3:1	Italy	4.8:1
8th	Northern Ireland	3.3:1	Greece	4.6:1
9th	New Zealand	3.2:1	Ireland	4.6:1
10th	Italy	2.9:1	Austria	4.1:1
11th	Ireland	2.9:1	France	4.1:1
12th	France	2.6:1	Belgium	4.1:1
13th	Spain	2.6:1	<b>Australia</b>	<b>4.1:1</b>
14th	Hungary	2.5:1	Spain	4.0:1
15th	Sweden	2.5:1	Switzerland	3.9:1
16th	Norway	2.5:1	Sweden	3.7:1
17th	Switzerland	2.4:1	Norway	3.5:1
18th	England & Wales	2.3:1	Germany	3.3:1
19th	Scotland	2.2:1	Netherlands	2.9:1
20th	Belgium	2.1:1	England & Wales	2.9:1
21st	Germany	2.1:1	Hungary	2.7:1
22nd	Netherlands	1.9:1	Scotland	2.7:1
23rd	Denmark	1.5:1	Denmark	2.5:1

**Ethnicity:** The prevalence of suicide in Caucasians is approximately double than in other ethnicities, although a trend towards an increase in Afro-American people has recently been detected (2). In the USA circa 2 out of 3 suicides are committed by Caucasians. In those states in which the Caucasian population is less represented, suicide in black people appears with lower frequency. This observation seems to confirm the role of the isolation for an ethnicity as important risk factor for suicide.

**Marital status:** Being married seems generally to be a “protective” factor against suicide, at least if compared with other conditions. Childrearing responsibilities normally constitute an additional protective element (24). “Singles” in western cultures present higher rates, widows even higher rates, and separated/divorced people disproportionately increased rates. This phenomenon is particularly evident in male subjects, especially with regard to the first months from the loss/separation (25). In contrast with the generally protective effect of the marriage are early marriages (<20 years of age). For these teenage marriages a rate constantly higher than that of unmarried peers has been reported in several observations.

**Immigration:** The impact of immigration on suicide rates has been studied particularly in countries such as USA, Canada and Australia. In these countries, where the population is constituted by different ethnic groups, suicidal behaviour in a given group appears to be analogous to that of the country of origin, with rates tendentially slightly increased. In Australia, for example, immigrants from Greece, Italy, Pakistan evidence suicide rates remarkably lower than those of immigrants coming from Eastern European countries, or from Scotland or Ireland, countries with traditionally higher suicide rates (26)(Tab.6). This observation strongly emphasises the role of cultural factors in suicidal behaviour.

**Table 6 - Standardised suicide rates (per 100 000) in Australia, by birthplace, for all ages, 1982-1992,.**

Year	Australia	U.K. & Ireland	Southern Europe	Eastern Europe	Western Europe	Oceania	Asia	Total Overseas Born
1982	11	12	7	31	19	14	8	13
1983	11	12	8	21	16	10	12	12
1984	11	11	5	17	17	17	9	11
1985	11	12	6	20	17	14	7	12
1986	12	13	6	17	19	14	8	12
1987	14	14	7	28	17	17	8	13
1988	13	15	8	20	14	17	9	13
1989	12	13	7	16	16	14	8	12
1990	13	12	5	14	19	14	8	11
1991	14	14	9	22	19	13	8	12
1992	13	13	8	24	17	14	7	12

*Source: ABS, 1994. Commonwealth of Australia copyright reproduced by permission.*

**Employment:** Suicidal behaviour is more frequent in unemployed than in employed people. Indigence and a socially deteriorated role –both a consequence of lack of work- appear to be variables often associated with increased suicidal behaviour, especially in case of sudden loss of a previous occupation. Several studies have evidenced increased rates of suicide during periods of economic recession and high unemployment rates (27). The reverse has been demonstrated during “booming” periods. However, research into unemployment impact has generally suffered from a number of confounding factors, such as the bringing together of subjects waiting for first employment with others who have lost their occupation, length of the unemployment period, “under the table” work, concomitance with psychiatric conditions and personality disorders, etc.

**Religion:** Grossly speaking, suicide rates are highest in countries where religious practices are or were strongly discouraged or opposed (such as was the case in former communist countries) followed by countries in which oriental religions predominates, and by countries where Protestant Christianity is stronger. Countries that are predominantly Moslem have the lowest suicide rates, immediately preceded by countries that are largely Roman Catholic. Unfortunately no data are available in relation to the

majority of countries following animistic religions, mostly found in Africa. This obviously does not capture the importance nor the degree of individuals' adherence to and observation of the precepts of a given religious denomination (28); nevertheless, it remains an interesting aspect of the sociology of suicide.

**Urban/Rural Place of Residence:** Although the number of suicides is far greater in urban areas, rural and remote areas often demonstrate higher suicide rates. For example, in 1997 New York (Manhattan) recorded 1,372 suicides, a number three times higher than that of the state of Nevada (411), but the latter has more than three times the rate of New York (24.5 –the highest in the USA- versus 7.6). Urban/rural differences in suicide rates are not unique to USA. Similar distribution has been several times reported in Australia (18), but also in European countries such as Scotland and England and Wales, where farmers have been found to have high rates of suicide. The higher rates of suicide in women in rural areas of China have already been quoted.

**Climate:** Approximately, warmer countries seem to be accompanied by lower rates of suicide. At least in the northern hemisphere, increases in rates of suicide appear more frequent in Spring (April-May) and Fall (November), with a quite remarkable overlapping with seasonal variation in mood disorders. Contrarily to popular beliefs, there are no relevant increases during Christmas or Summer vacations.

### Conditions of Direct Medical Interest

In the previous sections a number of sociodemographic characteristics correlated with a possible increase in the risk of suicidal behaviour have been reviewed. Said variables are estimated to contribute *per se* to suicide exposure only to a mild degree. Other biopsychosocial factors may play a more relevant role in a suicidal process. Their action, by the way, should in any case not be considered dysconjoined from other contributory factors. For example, a psychiatric condition (thought to be a major determinant in suicidal behaviour) may induce negative reactions in the surrounding environment of the suffering individual; this, in turn, may increase the degree of isolation of the patient, worsening symptoms and augmenting dependence on health carers. The emotional crisis that can be consequent to that may or may not drive the patient to consider suicide dependently on the action of other concomitant factors, such as the presence of a supportive

family (protective factor) or the existence in the individual of strong impulsive traits and tendency for acting out (predisposing condition).

For clinical purposes, the individualised prediction of the suicide risk is far more disappointing than any epidemiologically-based profile of subjects at risk. A classical example to explain this is provided by the following cluster of risk factors: being an elderly male subject, recently widowed, living in isolation and in poor financial conditions, suffering from depression and alcohol abuse. The summatory risk for a person such the above could be quantified in one probability out of four to five to commit suicide. Unfortunately, it is not yet possible to identify who amongst the four-five elderly men with the described characteristics would eventually die by suicide. Evidently, other factors (the role of which is still not clearly determined) should make the difference. Furthermore, if risk factors have to be mingled with protective factors (eg, coping style, moral beliefs, etc), preventing suicide appears to be a true *ars imperfecta*.

**Mental Disorders:** Psychological autopsy studies demonstrated that the vast majority of suicided people suffered from a psychiatric condition at the time of their death. A meaningful percentage of all suicided persons had in their history at least one psychiatric admission. Globally speaking, psychiatric diseases represent the strongest risk-factor for suicidal behaviour. Conditions most frequently associated with suicide are mood disorders (major depression and bipolar disorder), alcohol abuse and schizophrenia. However, depression plays a major role, being involved in 65-90% of all suicides with psychiatric pathologies (29). On the other hand suicide constitutes the most dramatic outcome of a mood disorder, with a life-time risk estimated around 12-15%. Among depressive people, risk seems to be higher when patients are not compliant with treatment or consider themselves as untreatable (or are considered as such). Generally speaking, treatment-resistant patients appear more exposed to the risk of suicide.

Alcohol abuse is also a very important risk factor for suicide. In the USA it has been reported that at least one fourth of all suicides involves alcohol abuse. Life-time risk of committing suicide in alcoholics is not much lower than that of depressive disorders (30); on the other hand, points of contact between these two pathologies are multiple and are often difficult to distinguish. Frequently, a depressive condition appears subsequent to a period of alcohol abuse, but this in its turn may complicate several other psychiatric conditions, including the very mood disorders, schizophrenia, anxiety disorders, personality disorders. However, while in depressive



disorders suicide happens relatively early in the history of the disease (especially in the fourth decade of life), in alcoholics suicide usually occurs late in the condition, often in concomitance with breakdown in important relationships, social emargination, indigence, and onset of a somatic complication of the chronic abuse.

Schizophrenia is another psychiatric condition with high exposure to the risk of suicide, estimated to be 10-12% for life-time. The risk is particularly relevant in young males patients, in the early stages of the disease, especially for those subjects with good psychosocial functioning before the onset of the illness, chronic relapses and fears of “mental disintegration” (21). These individuals frequently evidence poor levels of compliance to treatments. A history of previous suicide attempts constitutes a further increase in the total risk, as it is for all suicide cases, regardless their nosographic appartenance (while being recently discharged from a psychiatric hospital probably represents the most powerful single predictor of suicide). As already mentioned, other conditions (depression, alcohol abuse) may superimpose to schizophrenia, aggravating the risk of suicide. It is frequently reported that suicide in schizophrenics occurs during phases of clinical remission from florid symptoms, when a depressive elaboration of what happened also occurs. Suicide following “command” voices should be considered a very rare phenomenon in schizophrenics, while deaths occurring as a result of grandiose or megalomaniac delusions shouldn’t be recorded as suicidal cases. Tab. 7 provides the prevalence of mental disorders in 5,588 cases of suicide (31).

**Table 7 – Psychiatric diagnoses in 5588 cases of suicide**

*(Source: WHO: Primary Prevention of Mental, Neurological and Psychosocial Disorders. Geneva, WHO, 1998)*

Diagnosis	Number of diagnosis	Percentage of total number of diagnoses
Affective disorders	1400	24%
Neurotic & Personality disorders	1340	22%
Substance abuse	947	16%
Organic brain syndrome	308	5%
Other mental disorders	1259	21%
No psychiatric diagnosis	137	2%

*The number of diagnoses is greater than the number of cases due to multiple diagnoses, in some cases.*

**Personality Disorders and Traits:** Personality disorders are much more frequently associated with youth suicide than with suicide in older adults (2). The personality disorders most frequently associated with suicidal behaviour are the borderline and antisocial ones. It is the borderline type that particularly exposes individuals to the risk of suicide (32), with a frequency which is supposed to be twofold the one of antisocial personalities. Both disorders render their sufferers especially prone to non-fatal suicidal behaviour. Co-morbid conditions resulting from the association of mood disorder or substance abuse (eg, alcohol, drugs) and one of the above personality disorders further increase the risk of suicide. Also the narcissistic and the depressive personality disorders resulted associated with an increased mortality by suicide, while the histrionic type has often been associated with non-fatal, manipulative acts.

Also personality traits have been identified as important correlates of fatal suicidal behaviour. For example, obsessive-compulsive traits, perfectionism, cognitive rigidity and dichotomous thinking have all been associated with an increased risk of suicide. In fact, inability to find alternative solutions to their cognitive approach once facing life problems renders these individuals particularly prone to experience feelings of hopelessness and helplessness, which in their turn considerably increase the risk of committing suicide. Confirming this, Beck et al (33), in a ten-year longitudinal evaluation, underlined the importance of feelings of hopelessness as a major predictor of suicidal behaviour. In their study, lack of future expectations correctly identified 91% of subjects who subsequently died by committing suicide.

Particular attention should be paid to those subjects characterised by impulsivity and manifest aggressiveness. There is evidence today for these features being associated with an abnormal functioning of the serotonergic system (34). Proneness towards social withdrawal, difficulty in making and maintaining interpersonal relationships, lack of trust in others, low self-esteem are also factors associated in several investigations with suicidal behaviour.

**Somatic Diseases:** Suicide may be the consequence of a severe and painful somatic illness, especially when disabling. Particularly in the absence of a family support, such condition may carry death wishes and suicidal ideation. As a matter of fact, the prevalence of physical illness in suicided subjects is estimated to be at least 25% and in more than 40% of cases it is considered as an important contributory factor to suicidal behaviour and ideation, especially if concomitant to a mood disorder or depressive symptoms (35).

Understandably, the perspective of unbearable suffering and humiliating dependence may render envisageable the “rational” hypothesis of prematurely ending life. However, several investigations have demonstrated that only rarely suicide occurs in subjects suffering from a physical illness in absence of psychiatric symptoms (29).

Medical conditions such as epilepsy, multiple sclerosis, Huntington chorea, cancer, AIDS, peptic ulcer are the most frequently associated with suicidal behaviour. All these conditions have as common denominator depressive symptoms and the fear of unsustainable suffering. Sometimes subjects may commit suicide under the conviction (often delusional) of being affected by a terminal illness (eg, cancer) or by a permanently disabling condition (eg, blindness)(36).

Even the use of some common medicaments may result in suicidal ideation and behaviour. This has been the case of several steroid compounds, of L-dopa, propranolol and reserpine, to quote the most frequently reported. These substances have been associated with the onset of severe depressive symptomatology, and with inducing suicidal thoughts and behaviour.

**Biological Risk Factors:** Diminished function of the neurotransmitter serotonin in the brain is involved in suicidal behaviour. The evidence for this comes from cerebrospinal fluid (CSF), neuroendocrine challenge and blood platelet studies of serotonergic function in patients who have exhibited suicidal behaviour. Postmortem neurochemical studies of the brain of suicide victims have also shown changes in the serotonergic system, particularly in the ventrolateral prefrontal cortex (34).

The finding that a low CSF concentration of the serotonin metabolite 5-hydroxyindoleacetic acid (5-HIAA) is associated with suicidal behaviour has been replicated many times and across various psychiatric diagnoses, suggesting a relationship with suicidal behaviour rather than with a specific psychiatric diagnosis. Furthermore, low CSF 5-HIAA and blunted neuroendocrine responses to serotonergic challenges have been shown to persist over time after episodes of illness. Thus, serotonergic abnormalities appear to represent trait abnormalities rather than illness-related state changes. Serotonergic trait abnormalities are thought to lead to a lowering of the threshold for suicidal behaviour at times of stress or psychiatric illness. Impaired prefrontal cortex serotonergic function may underlie a reduced ability to resist impulses to act on suicidal thoughts.

**Genetic Risk Factors:** Genetic factors also appear to play a part in suicide risk. Data from clinical, twin and adoption studies suggest that genetic factors play a role in suicidal behaviour. For example, a family history of suicide has been found to be associated with suicidal behaviour in all psychiatric diagnoses. Twin studies have shown that monozygotic twins, who share 100% of their genes, have a significantly higher concordance for both suicide and attempted suicide than dizygotic twins who share 50% of their genes (38). Adoption studies show that significantly more biological relatives of adoptees who committed suicide had themselves suicided in comparison with biological relatives of control adoptees (39). As these suicides were largely independent of the presence of psychiatric disorder, it suggests that there is a genetic predisposition for suicide independent of, or additive to, the major psychiatric disorders associated with suicide.

Molecular genetic studies have been reported in suicide. Tryptophan hydroxylase (TPH) is the rate limiting enzyme in the synthesis of serotonin, the neurotransmitter implicated in suicide. Polymorphisms in the TPH gene have been recently associated with a history of attempted suicide.

**Psychosocial Factors:** Intense depressive feelings with suicidal ideation may be triggered by a loss, especially if this involves a partner or a very near and dear person. If the death of that person implies social isolation or dependence upon institutions, risk of suicide appears increased. Many studies have also underlined the association of early parental losses with later suicidal behaviour. Obviously, social isolation and lack of support may result from personality characteristics (impulsivity, hostility, immaturity); however, from psychological autopsy studies it appears that extreme social withdrawal very frequently precedes the suicidal act (40).

Many are the possible causes of social isolation: apart from death of a significant other, breakdown in relationships, separation/divorce, migration, etc. Also soldiers and more frequently jail inmates may suffer from severe social isolation. As already reported, subjects with psychiatric problems are particularly exposed to reductions in social support. Nevertheless, the vast majority of people experiencing severe losses or social isolation do not commit suicide.

An important precipitating factor may be constituted by the content of humiliation involved in the distressing situation. Examples of that are: being fired, the imminence of a disciplinary act or of being put in jail, the divulgation of own economic failure, etc. Humiliation and shame are

typically present in sexual abuse victims (2). If the abuse happened in childhood or adolescence, it frequently induces generalized mistrust feelings in interpersonal relationships, difficulty in maintaining such relations, persistent sexual difficulties, intense feelings of inadequacy and inferiority. It has been suggested that a number of suicides in prison may actually be related to sexual abuses.

There is some evidence that suggests that some forms of newspaper and television coverage of suicide stories is associated with a statistically significant excess of mortality due to suicide. According to Phillips (41), the degree of publicity given to a suicide story directly correlates with the number of suicides. Cases of suicides involving celebrities have been associated with greater impact. However, these observations are based on peaks in aggregate data and cannot demonstrate the direct exposure of suicided subjects to the media news or stories (42). This influence of media is reported to be strongest among young people, where it may provoke series of imitative suicides (this copycat phenomenon is known as “Werther effect” from the name of the hero of the Goethe’s book “*The Sorrows of the Young Werther*”).

**History of previous suicidal behaviour:** A previous suicide attempt is the most powerful single predictor of subsequent fatal suicidal behaviour (2). The risk is higher in the first year, and especially in the first 6 months after the attempt, with nearly 1% of individuals dying by suicide during that time (43). The level of increased risk due to the history of a previous attempt varies from author to author; Gunnell and Frankel, for example, report a 20-30 fold increase in risk in comparison to the general population, which seems to average several other reports (44).

Whilst the presence of previous suicide attempts is very common in suicided people, it should be noted that the majority who those who die by suicide do not present such an aspect (45).

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