

CHAPTER 7

Self-directed violence

Background

In the year 2000 an estimated 815 000 people died from suicide around the world. This represents an annual global mortality rate of about 14.5 per 100 000 population – or one death about every 40 seconds. Suicide is the thirteenth leading cause of death worldwide (see Statistical annex). Among those aged 15–44 years, self-inflicted injuries are the fourth leading cause of death and the sixth leading cause of ill-health and disability (1).

Deaths from suicide are only a part of this very serious problem. In addition to those who die, many more people survive attempts to take their own lives or harm themselves, often seriously enough to require medical attention (2). Furthermore, every person who kills himself or herself leaves behind many others – family and friends – whose lives are profoundly affected emotionally, socially and economically. The economic costs associated with self-inflicted death or injuries are estimated to be in the billions of US dollars a year (3).

How is suicide defined?

Suicidal behaviour ranges in degree from merely thinking about ending one's life, through developing a plan to commit suicide and obtaining the means to do so, attempting to kill oneself, to finally carrying out the act ("completed suicide").

The term "suicide" in itself evokes direct reference to violence and aggressiveness. Apparently, Sir Thomas Browne was the first to coin the word "suicide" in his *Religio medici* (1642). A physician and a philosopher, Browne based the word on the Latin *sui* (of oneself) and *caedere* (to kill). The new term reflected a desire to distinguish between the homicide of oneself and the killing of another (4).

A well-known definition of suicide is the one that appears in the 1973 edition of the *Encyclopaedia Britannica*, quoted by Shneidman: "the human act of self-inflicting one's own life cessation" (5). Certainly in any definition of suicide, the intention to die is a key element. However, it is often extremely difficult to reconstruct the thoughts of people who commit suicide unless they have made clear statements before their death about their

intentions or left a suicide note. Not all those who survive a suicidal act intended to live, nor are all suicidal deaths planned. To make a correlation between intent and outcome can therefore be problematic. In many legal systems, a death is certified as suicide if the circumstances are consistent with suicide and if murder, accidental death and natural causes can all be ruled out.

There has been much disagreement about the most suitable terminology to describe suicidal behaviour. Recently, the outcome-based term "fatal suicidal behaviour" has been proposed for suicidal acts that result in death – and similarly "non-fatal suicidal behaviour" for suicidal actions that do not result in death (6). Such actions are also often called "attempted suicide" (a term common in the United States of America), "parasuicide" and "deliberate self-harm" (terms which are common in Europe).

The term "suicidal ideation" is often used in the technical literature, and refers to thoughts of killing oneself, in varying degrees of intensity and elaboration. In the literature, the term also refers to a feeling of being tired of life, a belief that life is not worth living, and a desire not to wake from sleep (7, 8). Although these different feelings – or ideations – express different degrees of severity, there is not necessarily a continuum between them. Furthermore, the intention to die is not a necessary criterion for non-fatal suicidal behaviour.

Another common form of self-directed violence is self-mutilation. This is the direct and deliberate destruction or alteration of parts of the body without conscious suicidal intention. Favazza (9) has proposed three main categories:

- Major self-mutilation – including self-blinding and the amputation of fingers, hands, arms, limbs, feet or genitalia.
- Stereotypical self-mutilation – such as banging one's head, biting oneself, hitting one's arm, gouging one's eyes or throat, or pulling one's hair.
- Superficial-to-moderate self-mutilation – such as cutting, scratching or burning one's skin, sticking needles into one's skin, or pulling one's hair compulsively.

Self-mutilation involves very different factors from suicidal behaviour and will not be discussed here further. For an extensive review of self-mutilation, see Favazza (9).

The extent of the problem

Fatal suicidal behaviour

National suicide rates vary considerably (see Table 7.1). Among countries reporting suicide to the World Health Organization, the highest suicide rates are found in Eastern European countries (for example, Belarus 41.5 per 100 000, Estonia 37.9 per 100 000, Lithuania 51.6 per 100 000 and the Russian Federation 43.1 per 100 000). High rates of suicide have also been reported in Sri Lanka (37 per 100 000 in 1996), based on data from the WHO Regional Office for South-East Asia (10). Low rates are found mainly in Latin America (notably Colombia 4.5 per 100 000 and Paraguay 4.2 per 100 000) and some countries in Asia (for example, the Philippines 2.1 per 100 000 and Thailand 5.6 per 100 000). Countries in other parts of Europe, in North America, and parts of Asia and the Pacific tend to fall somewhere in between these extremes (for example, Australia 17.9 per 100 000, Belgium 24.0 per 100 000, Canada 15.0 per 100 000, Finland 28.4 per 100 000, France 20.0 per 100 000, Germany 14.3 per 100 000, Japan 19.5 per 100 000, Switzerland 22.5 per 100 000 and the United States

TABLE 7.1
Age-adjusted suicide rates by country, most recent year available^a

Country or area	Year	Total number of suicides	Suicide rate per 100 000 population			
			Total	Male	Female	Male: female ratio
Albania	1998	165	7.1	9.5	4.8	2.0
Argentina	1996	2 245	8.7	14.2	3.9	3.6
Armenia	1999	67	2.3	3.6	— ^b	— ^b
Australia	1998	2 633	17.9	28.9	7.0	4.1
Austria	1999	1 555	20.9	32.7	10.2	3.2
Azerbaijan	1999	54	1.1	1.7	— ^b	— ^b
Belarus	1999	3 408	41.5	76.5	11.3	6.7
Belgium	1995	2 155	24.0	36.3	12.7	2.9
Bosnia and Herzegovina	1991	531	14.8	25.3	4.2	6.1
Brazil	1995	6 584	6.3	10.3	2.5	4.1
Bulgaria	1999	1 307	16.4	26.2	7.7	3.4
Canada	1997	3 681	15.0	24.1	6.1	3.9
Chile	1994	801	8.1	15.0	1.9	8.1
China						
Hong Kong SAR	1996	788	14.9	19.5	10.4	1.9
Selected rural and urban areas	1999	16 836	18.3	18.0	18.8	1.0
Colombia	1995	1 172	4.5	7.4	1.8	4.1
Costa Rica	1995	211	8.8	14.4	3.0	4.7
Croatia	1999	989	24.8	40.6	11.6	3.5
Cuba	1997	2 029	23.0	32.1	14.2	2.3
Czech Republic	1999	1 610	17.5	30.1	6.3	4.8
Denmark	1996	892	18.4	27.2	10.1	2.7
Ecuador	1996	593	7.2	10.4	4.1	2.5
El Salvador	1993	429	11.2	16.3	6.8	2.4
Estonia	1999	469	37.9	68.5	12.0	5.7
Finland	1998	1 228	28.4	45.8	11.7	3.9
France	1998	10 534	20.0	31.3	9.9	3.2
Georgia	1992	204	5.3	8.7	2.5	3.4
Germany	1999	11 160	14.3	22.5	6.9	3.3
Greece	1998	403	4.2	6.7	1.8	3.7
Hungary	1999	3 328	36.1	61.5	14.4	4.3
Ireland	1997	466	16.8	27.4	6.3	4.3
Israel	1997	379	8.7	14.6	3.3	4.4
Italy	1997	4 694	8.4	13.4	3.8	3.5
Japan	1997	23 502	19.5	28.0	11.5	2.4
Kazakhstan	1999	4 004	37.4	67.3	11.6	5.8
Kuwait	1999	47	2.0	2.2	— ^b	— ^b
Kyrgyzstan	1999	559	18.7	31.9	6.3	5.1
Latvia	1999	764	36.5	63.7	13.6	4.7
Lithuania	1999	1 552	51.6	93.0	15.0	6.2
Mauritius	1999	174	19.2	26.5	12.1	2.2
Mexico	1997	3 369	5.1	9.1	1.4	6.3
Netherlands	1999	1 517	11.0	15.2	7.1	2.1
New Zealand	1998	574	19.8	31.2	8.9	3.5
Nicaragua	1996	230	7.6	11.2	4.3	2.6
Norway	1997	533	14.6	21.6	8.0	2.7
Panama (excluding Canal Zone)	1997	145	7.8	13.2	2.3	5.7
Paraguay	1994	109	4.2	6.5	1.8	3.6
Philippines	1993	851	2.1	2.5	1.6	1.6
Poland	1995	5 499	17.9	31.0	5.6	5.5
Portugal	1999	545	5.4	9.0	2.4	3.8

TABLE 7.1 (*continued*)

Country or area	Year	Total number of suicides	Suicide rate per 100 000 population			
			Total	Male	Female	Male: female ratio
Puerto Rico	1998	321	10.8	20.9	2.0	10.4
Republic of Korea	1997	6 024	17.1	25.3	10.1	2.5
Republic of Moldova	1999	579	20.7	37.7	6.3	6.0
Romania	1999	2 736	14.3	24.6	4.8	5.1
Russian Federation	1998	51 770	43.1	77.8	12.6	6.2
Singapore	1998	371	15.7	18.8	12.7	1.5
Slovakia	1999	692	15.4	27.9	4.3	6.5
Slovenia	1999	590	33.0	53.9	14.4	3.7
Spain	1998	3 261	8.7	14.2	3.8	3.8
Sweden	1996	1 253	15.9	22.9	9.2	2.5
Switzerland	1996	1 431	22.5	33.7	12.3	2.7
Tajikistan	1995	199	7.1	10.9	3.4	3.2
Thailand	1994	2 333	5.6	8.0	3.3	2.4
The former Yugoslav Republic of Macedonia	1997	155	10.0	15.2	5.2	2.9
Trinidad and Tobago	1994	148	16.9	26.1	6.8	3.8
Turkmenistan	1998	406	13.7	22.2	5.4	4.1
Ukraine	1999	14 452	33.8	61.8	10.1	6.1
United Kingdom	1999	4 448	9.2	14.6	3.9	3.8
England and Wales	1999	3 690	8.5	13.4	3.6	3.7
Northern Ireland	1999	121	9.9	17.0	— ^b	— ^b
Scotland	1999	637	15.7	25.3	6.3	4.0
United States	1998	30 575	13.9	23.2	5.3	4.4
Uruguay	1990	318	12.8	22.0	4.8	4.6
Uzbekistan	1998	1 620	10.6	17.2	4.4	3.9
Venezuela	1994	1 089	8.1	13.7	2.7	5.0

SAR: Special Administrative Region.

^a Most recent year available between 1990 and 2000 for countries with ≥ 1 million population.^b Fewer than 20 deaths reported; rate and rate ratio not calculated.

13.9 per 100 000). Unfortunately, little information is available on suicide from countries in Africa (11).

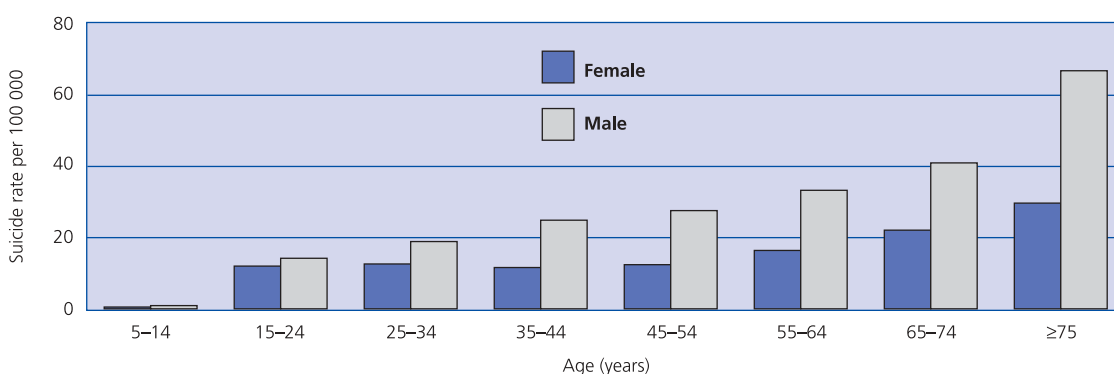
Two countries, Finland and Sweden, have data on suicide rates dating from the 18th century and both show a trend for increasing suicide rates over time (12). During the 20th century, Finland, Ireland, the Netherlands, Norway, Scotland, Spain and Sweden experienced a significant increase in suicides, while England and Wales (combined data), Italy, New Zealand and Switzerland experienced a significant decrease. There was no significant change in Australia (12). During the period 1960–1990, at least 28 countries or territories had rising suicide rates, including Bulgaria, China (Province of Taiwan), Costa Rica, Mauritius and Singapore, while eight had declining rates, including Australia, and England and Wales (combined data) (12).

Rates of suicide are not distributed equally throughout the general population. One important demographic marker of suicide risk is age. Globally, suicide rates tend to increase with age, although some countries such as Canada have also recently seen a secondary peak in young people aged 15–24 years. Figure 7.1 shows the global rates recorded by age and sex in 1995. The rates ranged from 0.9 per 100 000 in the group aged 5–14 years to 66.9 per 100 000 among people aged 75 years and older. In general, suicide rates among those aged 75 years and older are approximately three times higher than those of young people aged 15–24 years. This trend is found for both sexes, but is more marked among men. For women, suicide rates present differing patterns. In some cases, female suicide rates increase steadily with age, in others the rates peak in middle age, and in yet others, particularly in developing countries and among minority groups, female rates peak among young adults (13).

Although suicide rates are generally higher among older people, the absolute number of cases recorded is actually higher among those under 45 years of age than among those over 45 years, given demographic distributions (see Table 7.2). This is a remarkable change from just 50 years ago, when the absolute number of cases of suicide roughly increased with age. It is not explained in terms of the overall ageing of the global population; in fact, it runs counter to this demographic trend. At present, suicide rates are already higher among people under 45 years of age than among those over 45 years in approximately one-third of all countries, a phenomenon that appears to exist in all continents and is not correlated to levels of industrialization or wealth. Examples of countries

FIGURE 7.1

Global suicide rates by age and sex, 1995



and areas in which current suicide rates (as well as the absolute number of cases) are higher among those below 45 years of age than among those above 45 years include Australia, Bahrain, Canada, Colombia, Ecuador, Guyana, Kuwait, Mauritius, New Zealand, Sri Lanka and the United Kingdom. Youth suicide rates are particularly high in several Pacific Islands, such as Fiji (among ethnic Indians) and Samoa, both among males and females (14).

Sex, culture, race and ethnicity are also important factors in the epidemiology of suicide. Suicide rates are higher among men than women. The ratio of the suicide rate among males to that among females ranges from 1.0:1 to 10.4:1 (see Table 7.1). This ratio seems to be influenced, in part, by the cultural context. It is relatively low in parts of Asia (for example 1.0:1 in China, 1.6:1 in the Philippines, 1.5:1 in Singapore), high in several countries of the former Soviet Union (6.7:1 in Belarus, 6.2:1 in Lithuania), and very high in Chile (8.1:1) and Puerto Rico (10.4:1). On average, it appears that there are about three male suicides for every female one, and that this is so more or less consistently for different age groups, with the exception of advanced old age when men tend to have even higher rates. Generally speaking, the difference between the sexes in terms of suicide rates is narrower in Asian countries (15) than elsewhere in the world. The

often large differences in rates between countries and by sex show how important it is for each country to monitor its epidemiological trends to determine the population groups at greatest risk for suicide.

Within countries, the prevalence of suicide among Caucasians is approximately twice that observed in other races, although an increasing rate among African Americans has recently been reported in the United States (2). This pattern of higher prevalence among Caucasians has also been reported in South Africa and Zimbabwe (16). Exceptions to the generally higher rate among Caucasians are found in the former Soviet republics of Armenia, Azerbaijan and Georgia (17).

Belonging to the same ethnic group seems to be associated with similar suicide rates, as in the interesting example of Estonia, Finland and Hungary, all of which have very high rates, even though Hungary is geographically quite distant from Estonia and Finland. Conversely, different ethnic groups – even if they live in the same place – may have very dissimilar rates of suicide. In

TABLE 7.2

Percentage of all suicides, by age and sex^a

	Age (years)								Total
	5-14	15-24	25-34	35-44	45-54	55-64	65-74	≥75	
Males	0.7	12.7	18.3	20.5	17.0	13.9	9.6	7.3	100
Females	0.9	13.3	15.0	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

^a Based on data from countries reporting to the World Health Organization: most recent year available between 1990 and 2000.

Singapore, for instance, ethnic Chinese and Indians have much higher rates than ethnic Malays (18).

Suicide rates are frequently higher in indigenous groups, for example in some indigenous groups in Australia (19), China (Province of Taiwan) (20) and North America (21) (see Box 7.1).

Care in using suicide data

The way in which deaths of all types are recorded varies greatly between countries, making comparison of suicide rates between different countries extremely difficult. Even in those countries that have developed standard criteria, such as Australia, the way in which these criteria are applied can vary considerably (24). Erroneous estimates of suicide rates can sometimes result from such simple circumstances as government-imposed cut-off dates for published official statistics or delays because of coroners' inquiries. In Hong Kong SAR, China, for example, suicides are thought to be underestimated by between 5% and 18% solely for reasons of this nature (25).

Within a particular country, reported suicide rates can also vary according to the source of the data. For example, in China, estimates range from 18.3 per 100 000 (data reported to the World Health Organization), through 22 per 100 000 (Ministry of Health data), up to 30 per 100 000 (statistics from the Chinese Academy of Preventive Medicine) (26).

Data on mortality from suicide usually underestimate the true prevalence of suicide in a population. Such data are the end-product from a chain of informants, including those (often family members) who find the body, doctors, police, coroners and statisticians. Any of these people, for a variety of reasons, may be reluctant to call the death a suicide. This is likely to be particularly true in places where religious and cultural attitudes condemn suicide. Nevertheless, Cooper & Milroy (27) have found an underreporting of suicide by 40% in official records in certain regions of England. A suicide may be concealed so as to avoid stigmatization of the person who has taken his or her own life or of the person's family, for social convenience, for political reasons, to benefit from insurance policies,

or because it was deliberately masked as an accident by the person committing it – for example, as a road accident. Suicide can also be misclassified as an undetermined cause of death, or as a natural cause, for example when people – particularly the elderly – fail to take life-sustaining medicines.

Suicide can go officially unrecognized when drug users take an overdose, when people deliberately starve themselves (in what are termed “suicidal erosions” (28)), or when people die some time after their suicide attempt. In these cases, as well as cases of euthanasia or assisted suicide, the clinical cause of death is usually the one officially reported. Underreporting is also related to age, with the phenomenon generally much more prevalent among elderly people. Despite all these caveats, it has been argued that the relative ranking of national suicide rates is reasonably accurate.

Non-fatal suicidal behaviour and ideation

Relatively few countries have reliable data on non-fatal suicidal behaviour, the main reason lying in the difficulty of collecting information. Only a minority of those attempting suicide go to health facilities for medical attention. In addition, in many developing countries, attempted suicide remains a punishable offence and hospitals therefore do not register cases. Furthermore, in many places, injuries do not need to be reported and information on them is consequently not collected at any level. Other factors can also affect reporting, such as age, method of attempted suicide, culture and accessibility to health care. In short, the scale of attempted suicide is not clearly known for most countries.

There is some evidence to suggest that on average only about 25% of those carrying out suicidal acts make contact with a public hospital (possibly one of the best places for data collection) (29, 30) and these cases are not necessarily the most serious ones. The reported cases are thus only the tip of the iceberg, and the large majority of suicidal people remain unnoticed (31). Several institutions, including national centres for injury control and prevention, departments of statistics and, in several countries, departments of justice, keep records of non-fatal events registered with the health services. Such

BOX 7.1**Suicide among indigenous peoples: the cases of Australia and Canada**

In the past 20 to 30 years, suicide rates have increased strikingly among indigenous peoples in both Australia and Canada. In Australia, suicide among the Aboriginal and Torres Strait Islander populations used to be considered very uncommon. Slightly over a quarter of these people live in the state of Queensland. The overall suicide rate in Queensland for the period 1990–1995 was 14.5 per 100 000, while the rate for Aboriginal and Torres Strait Islander peoples was 23.6 per 100 000.

Suicides among indigenous Australians are heavily concentrated among young men. In Queensland, 84% of all indigenous suicides were among men aged between 15 and 34 years, and the rate for indigenous men aged 15–24 years was 112.5 per 100 000 (22). By far the most common method of suicide among young indigenous men is by hanging.

In Canada's Arctic north, suicide rates among the Inuit of between 59.5 and 74.3 per 100 000 have been reported in various studies, compared with around 15.0 per 100 000 in the overall population. Young Inuit men are at the highest risk for suicide, and their suicide rate is rising. Rates as high as 195 per 100 000 have been recorded among those aged 15–25 years (23).

Various explanations have been put forward for the high rates of suicide and suicidal behaviour among indigenous peoples. Among the proposed underlying causes are the enormous social and cultural turmoil created by the policies of colonialism and the difficulties faced ever since by indigenous peoples in adjusting and integrating into the modern-day societies.

In Australia, aboriginal groups were the object of stringent racial laws and discrimination as late as the 1960s. When these laws, including the restrictions on alcohol sales, were lifted within a short period in the 1970s, the rapid social changes in the previously oppressed indigenous peoples gave rise to instability in community and family life. This instability has continued ever since, with high rates of crime, delinquency and imprisonment, violence and accidents, alcohol dependence and substance abuse, and a homicide rate that is tenfold that among the general population.

In the Canadian Arctic in the early 19th century, epidemics swept the region as the first outsiders – whalers and fur traders – arrived, taking tens of thousands of lives and leaving a population reduced in size by two-thirds by 1900. By the 1930s the fur trade had collapsed, and Canada introduced a welfare state in the Arctic. In the 1940s and 1950s missionaries came to the Arctic and there was an attempt to assimilate the Inuit. Feverish exploration for oil, starting in 1959, further added to the social disintegration.

Research on suicide among the Canadian Inuit has identified several factors as likely indirect causes of suicide, including:

- poverty;
- childhood separation and loss;
- accessibility to firearms;
- alcohol abuse and dependence;
- a history of personal or familial health problems;
- past sexual or physical abuse.

Efforts are being made in both Australia and Canada to address suicidal behaviour among indigenous populations. In Australia, the national strategy to prevent suicides among young people includes a number of programmes for indigenous youths. These programmes are designed to address the specific needs of indigenous youths and are conducted in partnership with organizations representing the interests of indigenous peoples such as the Aboriginal Coordinating Council.

Constructive measures to prevent suicide in the Canadian Arctic include improved responses to crises, widespread community redevelopment and progress toward self-government in the indigenous areas. The new and vast territory of Nunavut was created on 1 April 1999, giving the Inuit people local self-determination and returning to them some of their rights and heritage.

records provide useful data for research and prevention purposes, since those who attempt suicide are at high risk for subsequent suicidal behaviour, both fatal and non-fatal. Public health officials also rely on reviews of hospital records, population surveys and special studies, sources that often include data lacking in mortality data systems.

Available figures show – both relative to their population size and in absolute numbers – that non-fatal suicidal behaviour is more prevalent among younger people than among older people. The ratio of fatal to non-fatal suicidal behaviour in those over the age of 65 years is usually estimated to be of the order of 1:2–3, while in young people under 25 years the ratio may reach 1:100–200 (32, 33). Although suicidal behaviour is less frequent in the elderly, the probability of a fatal outcome is much higher (28, 34). On average, suicide attempts in old age are, in psychological and medical terms, more serious and the “failure” of a suicide attempt is often the result of chance. Also, as a general trend, rates of non-fatal suicidal behaviour tend to be 2–3 times higher in women than in men. Finland, though, is a remarkable exception to this pattern (35).

Data from an ongoing, cross-national study of non-fatal suicidal behaviour in 13 countries, show that in the period 1989–1992 the highest average age-standardized rate of suicide attempts in men was found in Helsinki, Finland (314 per 100 000), while the lowest rate (45 per 100 000) was in Guipúzcoa, Spain – a sevenfold difference (35). The highest average age-standardized rate for women was in Cergy-Pontoise, France (462 per 100 000) and the lowest (69 per 100 000) was again in Guipúzcoa. With only one exception, that of Helsinki, the rates of suicide attempts were higher among women than among men. In the majority of centres, the highest rates were found in the younger age groups, while the rates among people aged 55 years and over were generally the lowest. The most common method used was poisoning, followed by cutting. More than half of those attempting suicide made more than one attempt, with nearly 20% of second attempts being made within 12 months of the first.

Data from a longitudinal, representative sample of nearly 10 000 adolescents aged 12–20 years in

Norway found that 8% had at one time attempted suicide and 2.7% had made such an attempt during the 2 years of the study period. Logistic regression analyses of the data showed that there was a greater likelihood of attempted suicide if the person had made an earlier suicide attempt, was female, was around the age of puberty, had suicidal ideation, consumed alcohol, did not live with both parents, or had a low level of self-esteem (36).

Suicidal ideation is more common than both attempted and completed suicide (8). However, its extent is still unclear. A review of studies published after 1985 on adolescent populations (particularly secondary-school students) suggested that between 3.5% and 52.1% of adolescents report suicidal thoughts (31). It is possible that these large percentage differences could be explained by the use of different definitions of suicidal ideation and by the different time periods to which the studies referred. There is evidence that women, including those in old age, are more prone to suicidal thoughts than are men (37). Overall, the prevalence of suicidal ideation among older adults of both sexes has been estimated at between 2.3% (for those having had suicidal thoughts in the past 2 weeks) and 17% (for those ever having had suicidal thoughts) (38). However, compared with other forms of suicidal behaviours, such as attempted suicide, suicidal ideation may not be a useful indicator of which adolescents or adults are most in need of preventive services.

What are the risk factors for suicidal behaviour?

Suicidal behaviour has a large number of underlying causes. The factors that place individuals at risk for suicide are complex and interact with one another. Identifying these factors and understanding their roles in both fatal and non-fatal suicidal behaviour are central to preventing suicides. Epidemiologists and experts in suicide have described a number of specific characteristics that are closely associated with a heightened risk for suicidal behaviour. Apart from demographic factors – such as age and sex, both already mentioned above – these include psychiatric, biological, social

and environmental factors, as well as factors related to an individual's life history.

Psychiatric factors

Much of what is known about suicide risk comes from studies where researchers have interviewed a surviving parent or other close relative or friend to identify specific life events and psychiatric symptoms that a suicide victim had experienced in the weeks or months before dying. This type of work is known as a "psychological autopsy". Using this approach, research has shown that many adults who complete suicide exhibit prior evidence of signs or symptoms suggestive of a psychiatric condition months or even years before their death (39, 40).

Some of the principal psychiatric and psychological factors associated with suicide are (41–48):

- major depression;
- other mood [affective] disorders, such as bipolar disorder (a condition characterized by periods of depression, alternating with periods of elevated mood, or mania, and in which the changed states can last for days or even months);
- schizophrenia;
- anxiety and disorders of conduct and personality;
- impulsivity;
- a sense of hopelessness.

Depression plays a major role in suicide and is thought to be involved in approximately 65–90% of all suicides with psychiatric pathologies (42). Among patients with depression, the risk seems to be higher when they do not follow their treatment,

BOX 7.2

Depression and suicide

Depression is the mental disorder most often associated with suicide. Anxiety, a powerful driving force in the process of suicide, is closely interwoven with depression and the two disorders are sometimes indistinguishable. Studies have revealed that up to 80% of people who committed suicide had several depressive symptoms.

People of all ages can experience depression. However, it is frequently difficult to detect depression in men, who, in any case, seek medical help more seldom than women. Depression in men is sometimes preceded by various types of abuse and violence, both within and outside the family. The treatment of depression in men is of great importance, since in many cultures suicide is to a large extent a male phenomenon.

Among children and adolescents, the nature of depression usually differs from that found in adults. Depressed young people tend to exhibit more "acting-out" — such as truancy from school, declining school grades, bad behaviour, violence and abuse of alcohol or drugs — and also to sleep and eat more. At the same time, a refusal to eat and anorexic behaviour are frequently found in combination with depression in young people, particularly among girls, but also in boys. These severe eating disorders are themselves associated with an increased risk for suicide.

Depression often has physical manifestations, particularly among older people, including stomach ailments, dizziness, palpitations of the heart and pain in various parts of the body. Depression in the elderly may accompany other diseases and disorders, such as stroke, myocardial infarction, cancer, rheumatism, and Parkinson or Alzheimer disease.

The tendency to suicide can be reduced if depression and anxiety are treated. Many studies have confirmed the beneficial effects of antidepressants and various forms of psychotherapy, particularly cognitive behavioural therapy. Providing good psychosocial support for elderly people, including the use of a telephone to reach social and health workers and others, has also been shown to produce a significant reduction in depression and the number of deaths from suicide among older people.

consider themselves untreatable, or are considered by specialists to be untreatable (43) (see Box 7.2). The lifetime risk of suicide in those affected by major and bipolar depression has been estimated at around 12–15% (44, 45), although a recent re-examination of the evidence has suggested a much lower level of risk (46).

Schizophrenia is another psychiatric condition with a high association with suicide, and the lifetime risk of suicide among people with schizophrenia is estimated to be about 10–12% (47). The risk is particularly strong in: young male patients; patients in the early stages of the disease, especially those who performed well, mentally and socially, before the onset of the illness; patients with chronic relapses; and patients with a fear of “mental disintegration” (48).

Other factors, such as feelings of hopelessness and helplessness also increase the risk of committing suicide. In a 10-year longitudinal study in the United States, for example, Beck et al. (49) brought out the importance of feelings of hopelessness as a major predictor of suicidal behaviour. In this study, lack of future expectations correctly identified 91% of subjects who subsequently committed suicide.

Alcohol and drug abuse also play an important role in suicide. In the United States, at least one-quarter of all suicides are reported to involve alcohol abuse (50). The lifetime risk of committing suicide among people who are dependent on alcohol is not much lower than that among people with depressive disorders (50). There are, however, many close links between alcohol abuse and depression, and it is often difficult to determine which of the two is the leading condition. For instance:

- Alcohol abuse may lead directly to depression or indirectly through the sense of decline and failure that most people who are dependent on alcohol experience.
- Alcohol abuse may be a form of self-medication to alleviate depression.
- Both depression and alcohol abuse may be the result of specific stresses in the person's life.

However, while suicide among those suffering depressive disorders happens relatively early in the history of the disease, particularly in the 30–40-year-old age group, suicide among those suffering from alcohol dependence usually occurs late in the condition. In addition, when it does then occur, it is often alongside other factors such as a breakdown in relationships, social marginalization, poverty and the onset of physical deterioration resulting from chronic abuse of alcohol. It is thought that alcohol and drug abuse play a lesser role in suicide in parts of Asia than elsewhere. In a study of suicide among teenagers in Hong Kong SAR, China, only about 5% of those who committed suicide had a history of alcohol or drug abuse (51). This finding might explain the relatively low rate of teenage suicide in Asia, except for China.

A previous suicide attempt is, however, one of the most powerful predictors of subsequent fatal suicidal behaviour (2). The risk is higher in the first year – and especially in the first 6 months – after the attempt. Almost 1% of individuals who attempt suicide die within 1 year (52), and approximately 10% eventually complete suicide. Estimates of the increase in risk resulting from a history of previous attempts vary from one study to another. Gunnell & Frankel, for example, report a 20–30-fold increase in risk in comparison with the general population, which is consistent with other reports (53). While the presence of a previous suicide attempt increases the risk that a person will commit suicide, the majority of those who commit suicide have not previously attempted it (24).

Biological and medical markers

A family history of suicide is a recognized marker for increased risk of suicide. To some researchers, this suggests that there may be a genetic trait that predisposes some people to suicidal behaviour. Indeed, data from studies on twins and adopted children confirm the possibility that biological factors may play a role in some suicidal behaviour. Studies on twins 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 (54). However, there have as yet been no studies on monozygotic twins reared apart – a prerequisite for a methodologically sound study – and none of the studies on twins have carefully controlled for psychiatric disorders. It could be that it is a psychiatric disorder that is inherited, rather than a genetic predisposition to suicidal behaviour, and that this disorder makes suicidal behaviour in related individuals more likely.

Findings from a case-control study of adopted children showed that those who committed suicide tended to have biological relatives who committed suicide (55). These suicides were largely independent of the presence of a psychiatric disorder, suggesting that there is a genetic predisposition for suicide independent of – or possibly in addition to – the major psychiatric disorders associated with suicide. Other social and environmental factors probably also interact with family history to increase the risk of suicide.

Further evidence suggesting a biological basis for suicide comes from studies of neurobiological processes that underlie many psychiatric conditions, including those that predispose individuals to suicide. Some studies, for example, have found altered levels of serotonin metabolites in the cerebrospinal fluid of adult psychiatric patients who committed suicide (56, 57). Serotonin is a very important neurohormone that controls mood and aggression. Low levels of serotonin and blunted responses to those tests that interfere with its metabolism have been shown to persist for some time after episodes of illness (58, 59). An impaired functioning of those neurons that contain serotonin in the prefrontal cortex of the brain may be an underlying cause of a person's reduced ability to resist impulses to act on suicidal thoughts (60, 61).

Suicide may also be the consequence of a severe and painful illness, especially one that is disabling. The prevalence of physical illness in those who commit suicide is estimated to be at least 25%, though it may be as high as 80% among elderly people who commit suicide (62). In more than 40% of cases, physical illness is considered an important contributory factor to suicidal behaviour and

ideation, especially if there are also mood disorders or depressive symptoms (63). It is understandable that the prospect of unbearable suffering and humiliating dependency might lead people to consider ending their life. However, several investigations have shown that people suffering from a physical illness rarely commit suicide in the absence of any psychiatric symptoms (42).

Life events as precipitating factors

Certain life events may serve as precipitating factors for suicide. Particular events that a small number of studies have tried to link to risk of suicide include personal loss, interpersonal conflict, a broken or disturbed relationship, and legal or work-related problems (64–67).

The loss of a loved one, whether through divorce, separation or death, may trigger intense depressive feelings, especially if the person lost was a partner or was exceptionally close. Conflicts in interpersonal relationships in the home, or in places of study or work can also unleash feelings of hopelessness and depression. In a study of over 16 000 adolescents in Finland, for example, researchers found an increased prevalence of depression and severe suicidal ideation both among those who were bullied in school and among those who were perpetrators of bullying (68). A retrospective study in south-east Scotland that controlled for age, sex and mental disorders found adverse interpersonal conflict to be independently associated with suicides (69). In a review of all suicides over a 2-year period in Ballarat, Australia, researchers found that social and personal difficulties were associated with suicide in over one-third of the cases (70). Research has also indicated a greater likelihood of depression and suicide attempts among victims of violence between intimate partners (71–74).

A history of physical or sexual abuse in childhood can increase the risk of suicide in adolescence and adulthood (75–77). Humiliation and shame are commonly felt by victims of sexual abuse (2). Those who were abused during childhood and adolescence often feel mistrustful in interpersonal relationships and have difficulty in maintaining such

relationships. They experience persistent sexual difficulties and intense feelings of inadequacy and inferiority. Researchers in the Netherlands examined the relationship between sexual abuse and suicidal behaviour in 1490 adolescent students, and found that those who had experienced abuse displayed significantly more suicidal behaviour, as well as other emotional and behavioural problems, than their non-abused peers (78). An ongoing 17-year longitudinal study of 375 subjects in the United States found that 11% had reported physical or sexual abuse before the age of 18 years. Subjects aged between 15 and 21 years who had been abused reported more suicidal behaviour, depression, anxiety, psychiatric disorders, and other emotional and behavioural problems than those who had not been abused (79).

Sexual orientation may also be related to an increased risk for suicide in adolescents and young adults (80, 81). Estimates of the prevalence of suicide among gay and lesbian youths, for example, range from 2.5% to 30% (82, 83). The factors that may contribute to suicides and attempted suicide here include discrimination, stress in interpersonal relations, drugs and alcohol, anxiety about HIV/AIDS and limited sources of support (84, 85).

Being in a stable marital relationship, on the other hand, would seem generally to be a “protective” factor against suicide. Responsibilities for bringing up children confer an additional protective element (86). Studies on the relationship between marital status and suicide reveal high rates of suicide among single or never-married people in Western cultures, even higher rates among widowed people, and some of the highest rates among people who are separated or divorced (87, 88). This last phenomenon is particularly evident in males, especially in the first few months after their loss or separation (89).

In an exception to the generally protective effect of marriage, those who marry early (before 20 years of age) have higher rates of suicidal behaviour than their unmarried peers, according to some studies (90, 91). Furthermore, marriage is not protective in all cultures. Higher rates of both fatal and non-fatal suicidal behaviour have been

reported among married women in Pakistan, compared with both married men and single women (92, 93). This may be because social, economic and legal discrimination creates psychological stress that predisposes these women to suicidal behaviour (92). Higher rates of suicide have also been reported among married women over the age of 60 years in Hong Kong SAR, China, compared with widowed and divorced women in this age group (90).

While problems in interpersonal relationships may increase the risk of suicidal behaviour, social isolation can also be a precipitating factor for suicidal behaviour. Social isolation lay behind Durkheim’s concepts of “egoistic” and “anomic” suicide (94), both of which were related to the idea of inadequate social connectedness. A large body of literature suggests that individuals who experience isolation in their lives are more vulnerable to suicide than those who have strong social ties with others (95–98). Following the death of a loved one, for example, a person may attempt suicide if there is insufficient support provided during the grieving period by those close to the bereaved person.

In a comparative study of social behaviour between groups of people who have attempted suicide, people who have completed suicide and people dying of natural causes, Maris (99) found that those who completed suicide had participated less in social organization, were often without friends and had shown a progressive decline in interpersonal relationships leading to a state of total social isolation. Psychological autopsy studies show that social withdrawal frequently precedes the suicidal act (99). This was also brought out in a study by Negron et al. (100), who found that people who attempted suicide were more likely to isolate themselves during an acute suicidal phase than those with suicidal ideation. Wenz (101) identified anomie – the feeling of alienation from society caused by the perceived absence of a supporting social framework – as one factor in the suicidal behaviour of widows, along with actual and expected social isolation. Social isolation has frequently been identified as a contributing factor in suicidal ideation among the elderly (102, 103). A study of suicide attempts among

adolescents under 16 years of age who had been referred to a general hospital found that the most frequent problems underlying such behaviour were relationship difficulties with parents, problems with friends, and social isolation (104).

Social and environmental factors

Research has identified a number of important social and environmental factors related to suicidal behaviour. These include such diverse factors as: the availability of the means of suicide; a person's place of residence, employment or immigration status; affiliation to a religion; and economic conditions.

Method chosen

A major factor determining whether suicidal behaviour will be fatal or not is the method chosen. In the United States, guns are used in approximately two-thirds of all suicides (105). In other parts of the world, hanging is more common, followed by the use of a gun, jumping from a height and drowning. In China, intoxication by pesticides is the most common method (106, 107).

In the past two decades, in some countries such as Australia, there has been a remarkable increase in hanging as a means of suicide, especially among younger people, accompanied by a corresponding decrease in the use of firearms (108). In general, elderly people tend to adopt methods involving less physical strength, such as drowning or jumping from heights; this has been recorded particularly in Hong Kong SAR, China, and Singapore (18). Nearly everywhere, women tend to adopt "softer" methods – for example, overdosing with medicines – both in fatal and in non-fatal suicide attempts (35). A notable exception to this is the practice of self-immolation in India.

Apart from age and sex, the choice of method in suicide may be influenced by other factors. In Japan, for example, the traditional practice of self-disembowelment with a sword (also known as *hara-kiri*) continues to occur. Imitation of a means of suicide, especially among young people and in relation to the death of a celebrity, is known to occur (109–111). How determined a person is to

kill themselves is usually related to the lethality of the method chosen: elderly people, for instance, normally express a greater determination than others to die and tend to choose more violent methods – such as shooting, jumping from a height or hanging – that afford less possibility of being rescued in the act (112).

Differences between urban and rural areas

There are frequently large disparities in suicide rates between urban and rural areas. In 1997 in the United States, for example, the district of Manhattan in New York City recorded 1372 suicides, a number three times that of the largely rural state of Nevada (411), but the rate in Nevada was more than three times that of New York state (24.5 per 100 000 – the highest in the United States – against 7.6 per 100 000) (113). Similar differences between urban and rural areas have been reported, for instance, in Australia (114), and in European countries, such as England and Wales (combined data) and Scotland, where farmers have high rates of suicide (115). Suicide rates among women in rural areas of China are also reported to be higher than in urban areas (26).

Reasons for the higher rates in many rural areas may include social isolation and the greater difficulty in detecting warning signs, the limited access to health facilities and doctors, and lower levels of education. Methods of suicide in rural areas are also often different from those used in urban areas. In rural communities in Eastern Europe and parts of south-east Asia, the easy availability of herbicides and pesticides makes them popular choices for the purposes of suicide. The same is true in Samoa, where the control of sales of the herbicide paraquat led to a decrease in the number of suicides (116). In rural communities of Australia, where the possession of guns is common, shooting is frequently reported as a method of suicide (114).

Immigration

The impact of immigration on suicide rates has been studied in countries such as Australia, Canada and the United States, all of which have a large mix

TABLE 7.3

Age-standardized suicide rates per 100 000 population in Australia, by place of birth, 1982–1992

Year	Place of birth							Total born overseas
	Asia	Australia	Europe			Ireland and United Kingdom	Oceania ^b	
			Eastern	Southern	Western ^a			
1982	8	11	31	7	19	12	14	13
1983	12	11	21	8	16	12	10	12
1984	9	11	17	5	17	11	17	11
1985	7	11	20	6	17	12	14	12
1986	8	12	17	6	19	13	14	12
1987	8	14	28	7	17	14	17	13
1988	9	13	20	8	14	15	17	13
1989	8	12	16	7	16	13	14	12
1990	8	13	14	5	19	12	14	11
1991	8	14	22	9	19	14	13	12
1992	7	13	24	8	17	13	14	12

Source: Reproduced, with minor editorial amendments, from reference 118 with the permission of the publisher.

^a Excluding Ireland and the United Kingdom.

^b Excluding Australia.

of ethnic groups. In these countries, the rate of suicidal behaviour in a given immigrant group has been found to be similar to that in their country of origin. In Australia, for example, immigrants from Greece, Italy and Pakistan have suicide rates that are lower than those of immigrants from countries in Eastern Europe or from Ireland or Scotland, all countries with traditionally high suicide rates (117) (see also Table 7.3). This suggests a strong role for cultural factors in suicidal behaviour.

Employment and other economic factors

Several studies have found increased rates of suicide during periods of economic recession and high unemployment (119–123) and the converse has also been demonstrated. In a study examining the impact of economic factors on suicide in Germany, Weyerer & Wiedenmann (122) investigated the effect of four economic variables and their relationship to suicide rates in the period 1881–1989. The strongest correlation was found during times of social disintegration, where there was high unemployment, with low levels of state welfare or protection and increased risks of bankruptcy. A preliminary investigation into the above-average suicide rate in the Kutznetzk Basin, Russian Federation, between 1980 and 1995 cited economic instability, the disintegration of the former Soviet Union and other

specific historical factors as possible contributory factors (123). In relating his visits to Bosnia and Herzegovina, Berk (124) wrote of a higher-than-expected rate of suicide as well as alcohol dependence among children. While they had survived the most immediate threats of the armed conflict during 1992–1995, the children had succumbed to long-term stress. In Sri Lanka, the Tamil community, which has a history of violence and political and economic instability, has traditionally had high rates of suicide. Today the Sinhalese community, which 20 years ago reported very low rates, also have

high rates. This clearly highlights the close association between suicide, political violence and social collapse.

At an individual level, suicidal behaviour is more frequent in unemployed than in employed people (119, 125, 126). Poverty and a socially diminished role – both consequences of unemployment – often appear to be associated with increased suicidal behaviour, especially where the job has been lost suddenly. Research in this area, however, has some limitations. In particular, it has not always taken account of the duration of unemployment. Those waiting for their first job have sometimes been grouped together with others who have lost their jobs, and psychiatric conditions and personality disorders have been ignored (127, 128).

Religion

Religion has long been regarded as an important factor in suicidal behaviour. Research has shown that an approximate ranking of countries, by religious affiliation, in descending order of suicide rates, is as follows:

- Countries where religious practices are prohibited or strongly discouraged (as was the case in the former communist countries of Eastern Europe and in the former Soviet Union).

- Countries where Buddhism, Hinduism or other Asian religions predominate.
- Countries where many people are Protestant.
- Countries that are predominantly Roman Catholic.
- Countries that are largely Muslim.

Lithuania is a notable exception to this rough pattern. The country has always been largely Catholic, with many practising adherents and a strong influence of the church, even when it was part of the former Soviet Union. Nevertheless, suicide rates were and remain extremely high. The approximate ranking given above clearly does not take into account how strongly individuals in a particular country believe in and adhere to their religion (129). The ranking also does not include animism – mainly found in Africa – because suicide rates among adherents to animistic beliefs are generally not known.

Durkheim believed that suicide stemmed from a lack of identification with a unitary group and postulated that suicide rates should be lower where there was a high level of religious integration. Accordingly, he argued that shared religious practices and beliefs, such as those associated with Catholicism, are protective factors against suicide (94). Some studies testing Durkheim's hypothesis have tended to support him (130, 131). Other studies have, however, found no association between the proportion of Roman Catholics in a population and suicide rates (132, 133). A study by Simpson & Conlin (134) on the impact of religion found that belief in Islam reduced suicide rates more than a belief in Christianity.

Some studies have tried to use church attendance and the extent of religious networks as a measure of religious faith, which they have then sought to link with suicide rates. Their findings suggest that church attendance has a strong preventive influence (135), with the degree of commitment to a particular religion being an inhibitor of suicide (136). Similarly, a study by Kok (137) examined suicide rates among the three ethnic groups of Singapore. The conclusion was that the ethnic Malays, overwhelmingly adherents of Islam, which is strongly opposed to suicide, had by far the lowest suicide rate.

At the same time, the ethnic Indians had the highest rate of suicide on the island. Singapore's ethnic Indians are generally followers of Hinduism, a faith that believes in reincarnation and does not strictly forbid suicide. Another study examining differences between African-American and Caucasian populations in the United States found that the lower rate of suicide among African Americans could be attributed to greater personal devotion to a religion (138).

Summary

Risk factors for suicidal behaviour are numerous and interact with one another. Knowing which individuals possess a predisposition to suicide, and also possibly face a combination of risk factors, can help pinpoint those most in need of prevention efforts.

Where there are sufficiently strong protective factors, even the presence of several risk factors – such as major depression, schizophrenia, alcohol abuse or loss of a loved one – may not create the conditions for suicidal ideation or behaviour in an individual. The study of protective factors is still in its infancy. If suicide research and prevention is to make real progress, there should be much greater knowledge about protective factors, to match the advances made in recent decades in the understanding of predisposing and precipitant factors in suicide.

Apart from Durkheim's observations on marriage and religion, a number of investigations have provided insights into the protective functions of parenthood (139), social support and family connectedness (36, 140–142), self-esteem (143) and repression of the ego (144). Other studies have directly weighed up the balance of risk and protective factors in trying to predict suicidal behaviour. In one such study, a survey of American Indian and Alaskan Native youths, Borowsky et al. (145) found that focusing on protective factors such as emotional well-being and connectedness with family and friends was as effective as or more effective than trying to reduce risk factors in the prevention of suicide. The study of protective factors would appear to be a promising field for future research.

What can be done to prevent suicides?

With the overall increase in suicidal behaviour, particularly among young people, there is a great need for effective interventions. As has been seen, there are a large number of possible risk factors for suicidal behaviour and interventions are usually based on a knowledge of these factors. Although many interventions have existed for a considerable period of time, very few of them have shown a significant effect in reducing suicidal behaviour or have produced long-term sustainable results (146).

Treatment approaches

Treatment of mental disorders

Since much published material and clinical experience show that a number of mental disorders are significantly associated with suicide, the early identification and appropriate treatment of these disorders is an important strategy for preventing suicide. Particularly relevant here are mood disorders, alcohol dependence and abuse of other substances, schizophrenia and certain types of personality disorder.

There is evidence that educating primary health care personnel to diagnose and treat people with mood disorders may be effective in reducing suicide rates among those at risk. Also, the new generation of drugs for the treatment of both mood and schizophrenic disorders, which have fewer side-effects and more specific therapeutic profiles than those used previously, would appear to improve patients' adherence to treatment and produce a better outcome, thus reducing the likelihood of suicidal behaviour in patients.

Pharmacotherapy

Pharmacotherapy has been examined for its efficacy in working on neurobiological processes that underlie certain psychiatric conditions, including those that are related to suicidal behaviour. Verkes et al. (147), for instance, showed that the substance paroxetine might be effective in reducing suicidal behaviour. The reason for choosing paroxetine was that suicidal behaviour has been associated with

reduced serotonin function. Paroxetine is known as a selective serotonin reuptake inhibitor (SSRI), and as such increases the availability of serotonin for the neural transmission of signals. In a 1-year double-blind study, paroxetine and a placebo were compared in patients who had a history of suicide attempts and had recently attempted suicide. These patients had not suffered major depression, but the majority had a "cluster B personality disorder" (which includes antisocial, narcissistic, borderline and histrionic personality disorders). The results showed that enhancing serotonin function with an SSRI, in this case paroxetine, may reduce suicidal behaviour in those patients with a history of suicide attempts, but not in those suffering from major depression.

Behavioural approaches

While many treatment approaches focus primarily on the mental disorder and assume that improvement in the disorder will lead to a reduction in suicidal behaviour, other approaches directly target the behaviour (148). Following this approach, a number of interventions have been developed, some of which are discussed below.

Behavioural therapy

In behavioural interventions, a mental health worker conducts therapy sessions with the patient, discussing previous and current suicidal behaviour and thoughts of suicide, and through probing tries to establish connections with possibly underlying factors (148). Early results on the efficacy of this type of treatment are promising, though there are no conclusive answers yet.

A study in Oxford, England, examined patients at high risk of multiple suicide attempts, aged 16–65 years, who had been admitted to an emergency unit after taking an overdose of antidepressants (149). Patients received either the standard treatment for suicide attempts or the standard treatment along with a brief "problem-oriented" intervention – a form of short-term psychotherapy that focused on the problem identified as being the most troublesome for the patient. The study found a significant benefit for the experimental group (those receiving

the intervention along with the standard treatment) 6 months after treatment, in terms of a decline in their rates of repeated suicide attempts. Unfortunately, this difference was no longer significant when the subjects were reassessed after 18 months.

A study in the United States (150) examined the effectiveness of dialectical behaviour therapy with patients exhibiting borderline personality disorders, multiple behavioural dysfunctions, significant mental disorders and a history of multiple suicide attempts. Dialectical behaviour therapy is a treatment designed for chronically suicidal patients. It uses behaviour analysis and a problem-solving strategy. During the first year after treatment, patients who had received the therapy made fewer suicide attempts than those who had received the standard treatment.

Another research study in the United States (151) that adopted a behavioural therapy approach examined patients with a history of attempting suicide. The aim was to see whether they displayed a “deficit in positive future thinking” – that is to say, whether they lacked hope and expectation for the future. If so, the study sought to establish whether such a deficit could be changed by a brief psychological intervention known as “manual-assisted cognitive behaviour therapy” (MACT). In such an intervention, the problem is worked through with the guidance of a manual, so as to standardize the treatment. Patients were randomly assigned to either MACT or the standard treatment for suicide attempts and reassessed after 6 months. The study found that patients with a history of attempting suicide showed less hope and had fewer positive expectations for the future than the matched group of community controls. After the MACT intervention, their expectations significantly improved, while those who received the standard treatment improved only marginally.

Green cards

The so-called green card is a relatively simple intervention. The client receives a card, giving him or her direct and immediate access to a range of options, such as an on-call psychiatrist or hospitalization. While it has not proved to be a particularly effective intervention, the green card

does seem to have some beneficial effects for those considering suicide for the first time (152, 153).

A recent study used the green card with patients who had attempted suicide for the first time and those with a history of suicide attempts (154). Study participants were randomly assigned to control groups that received only the standard treatment for suicide attempts, and experimental groups that received the standard treatment plus a green card. The green card offered a 24-hour crisis telephone consultation with a psychiatrist. The effect of the green card differed between the two types of experimental groups. It had a protective effect with those who had attempted suicide for the first time (though not a statistically significant one), but had no effect on those who had made previous attempts. It may be that the telephone support alone offered by the green card in the study was not enough, and that the card should have provided easy access to other crisis services.

Another intervention, based on the principle of connectedness and easy access and availability of help, is the Tele-Help/Tele-Check service for the elderly operating in Italy (155). Tele-Help is an alarm system that the client can activate to call for help. The Tele-Check service contacts clients twice a week to check on their needs and offer emotional support. In one study, 12 135 individuals aged 65 years and over were given the Tele-Help/Tele-Check service for 4 years (155). During this period, there was only one suicide in the group, compared with a statistically expected seven (156).

Relationship approaches

It is known that susceptibility to suicide is related to the social relationships that a person has: the greater the number of social relationships, the less in general is the susceptibility to suicide (156). Several interventions have sought to enhance social relationships so as to reduce repeated suicidal behaviour. The general approach is to explore problems in different areas of the patient’s social life and for the therapist to try to tackle these problems. Although the main goal is to prevent recurrent suicidal behaviour, the improvement of social relationships is in itself also considered important.

Research into the efficacy of relationship approaches has not demonstrated a positive benefit, in terms of reducing suicidal behaviour. However, the approach has been shown to produce improved social relationships.

Psychosocial interventions

Litman & Wold (156) investigated a particular outreach method, known as “continuing relationship maintenance” (CRM). In this method, the counsellor actively reaches out to the suicidal person and tries to maintain a constant relationship with him or her. A total of 400 people at high risk of suicide underwent this programme for an average of 18 months, being assigned either to the experimental (CRM) group or to a control group. In the control group, subjects received ongoing counselling and took the initiative *themselves* to contact the counsellor. The intervention did not manage to reduce suicidal ideation, attempted suicide or completed suicide. However, a number of intermediate goals were achieved, with the CRM group showing significant improvements compared with the control group. These improvements included reduced loneliness, more satisfactory intimate relationships, less depression and greater confidence in using community services.

Gibbons et al. (157) compared the effectiveness of “task-centred casework” – a problem-solving method that emphasizes collaboration between a patient and a social worker over matters related to daily living – with standard treatment in patients who had made a previous suicide attempt. There was no difference in the rate of repeated suicide attempts between the two groups, but the group that received task-centred casework showed a greater improvement in handling social problems than the control group.

In a study by Hawton et al. (158), 80 patients who had taken an overdose either received outpatient counselling or were referred back to their general practitioners with recommendations for further care. Again, there was no statistical difference in the rates of repeated suicide attempts, but there did seem to be some degree of benefit for the outpatient group when assessed after 4 months. A greater proportion of the

outpatient group, as compared with the second group, showed improvements in social adjustment, marital adjustment and relationships with their families. Counselling seemed most beneficial for women and for patients with problems involving a one-to-one relationship, such as husband–wife, parent–child or supervisor–employee relationships.

Community-based efforts

Suicide prevention centres

Besides the interventions described above, specific community mental health services exist for people exhibiting suicidal behaviour. A suicide prevention centre is designed to serve as a crisis centre offering immediate help, usually by telephone link, but there are also programmes with face-to-face counselling and outreach work.

Dew et al. (159) conducted a quantitative literature review of the effectiveness of suicide prevention centres and found no overall effect, either positive or negative, on suicide rates. The methodological limitations of their study, however, make it difficult to reach a definite conclusion. The authors did find that the proportion of suicides among clients attending prevention centres was greater than the proportion of suicides in the general population, and that individuals who completed suicide were more likely to have been clients at these centres. These findings suggest that the suicide prevention centres are at least attracting the high-risk population they are supposed to be helping.

Lester (160) reviewed 14 studies that examined the effectiveness of suicide prevention centres on suicide rates. Seven of these studies provided some evidence for a preventive effect. A study on suicide prevention centres in 25 cities in Germany actually found an increase in suicide rates in three of the cities (161).

School-based interventions

Programmes have been set up to train school staff, community members and health care providers to identify those at risk for suicide and refer them to appropriate mental health services. The extent of training will vary from programme to programme,

but in all cases a strong link to local mental health services is essential.

Lester (162), though, struck a note of caution in suggesting that as school staff become more knowledgeable, they may refer students to mental health professionals more rarely, which in itself may result in more suicides. Although education of school staff members, parents and others involved in school programmes is highly important, these people cannot replace mental health professionals. Nevertheless, health care facilities alone cannot meet all the needs of young people, and schools must be able to act as a medium for suicide prevention.

Societal approaches

Restricting access to means

Restricting access to the means of suicide is particularly relevant when such access can readily be controlled. This was first demonstrated in 1972 in Australia by Oliver & Hetzel (163), who found a reduction in suicide rates when access to sedatives – mainly barbiturates, which are lethal in high doses – was reduced.

In addition to this study concerning sedatives, there is also evidence of a reduction in suicide rates when other toxic substances are controlled, for example pesticides, which are widely disseminated in the rural areas of many developing countries. Perhaps one of the best-studied examples is that in Samoa (116), where until 1972, when paraquat

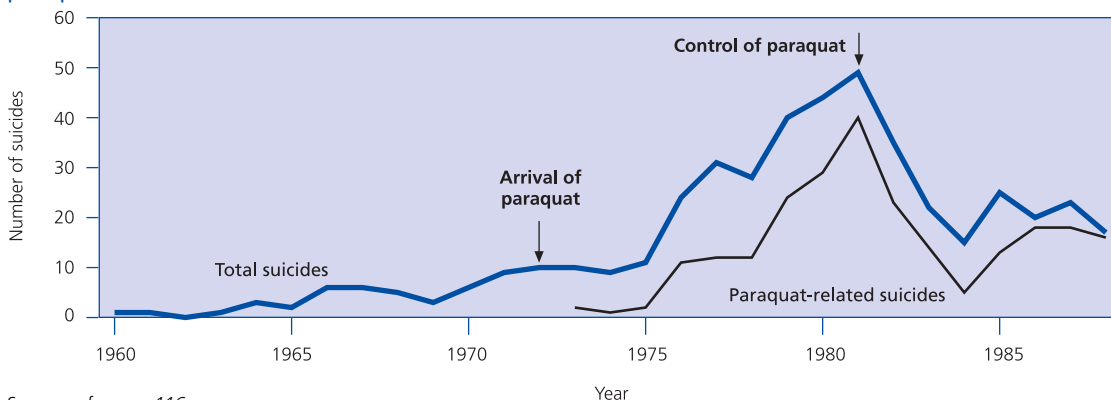
was first introduced into the country, the number of suicides was below 10. The number began to climb sharply in the mid-1970s and reached nearly 50 in 1981, when efforts to control the availability of paraquat began. During this period, suicide rates increased by 367%, from 6.7 per 100 000 in 1972 to 31.3 per 100 000 in 1981. Within 3 years, the suicide rate had dropped back to 9.4 per 100 000. Despite subsequent control of paraquat, more than 90% of all suicides in 1988 were effected by its use (see Figure 7.2).

Gas detoxification – the removal of carbon monoxide from domestic gas and from car exhausts – has proved effective in reducing suicide rates. In England, suicides from poisoning with domestic gas began to decline soon after carbon monoxide was removed from domestic gas (164) (see Figure 7.3). Similar declines in the use of domestic gas for suicide have been noted in Japan, the Netherlands, Scotland, Switzerland and the United States (165). Other studies have also found a reduction in suicides following the introduction of catalytic converters, which among other things remove carbon monoxide from car exhausts (165, 166).

The association between possession of handguns in the home and suicide rates has been noted (167–169). There are various approaches to reducing injuries from guns, whether accidental or intentional. They usually centre on legislation on gun sales and ownership, and on gun safety. Gun safety

FIGURE 7.2

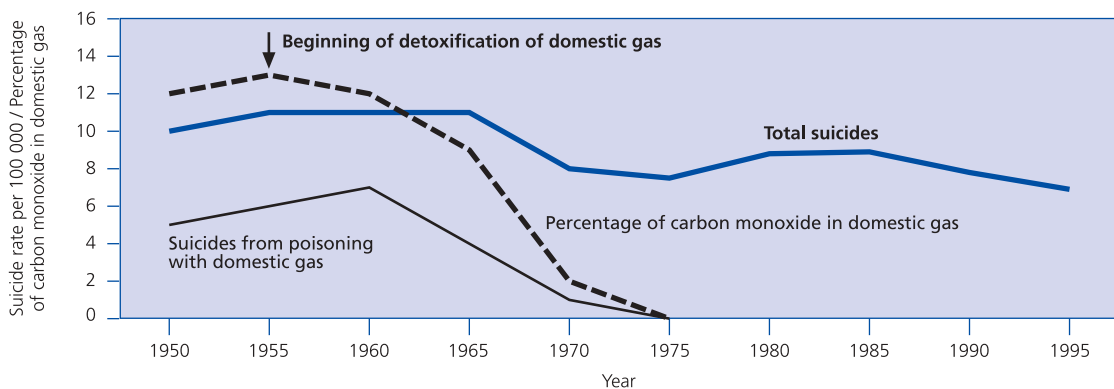
Number of suicides in Samoa in relation to the arrival of pesticides containing paraquat and the control of sales of paraquat



Source: reference 116.

FIGURE 7.3

Impact of detoxification of domestic gas (%CO) on suicide rates, England and Wales, 1950–1995



Source: reference 164.

measures include education and training, various storage practices (such as storing guns and ammunition separately, and keeping guns unloaded and in locked places) and trigger-blocking devices. In some countries – including Australia, Canada and the United States – restrictions on the ownership of firearms have been associated with a decrease in their use for suicide (165, 169).

Media reporting

The potential impact of the media on suicide rates has been known for a long time. More than two centuries ago, a widely read novel inspired a spate of imitation suicides. Johann Wolfgang Goethe's *Die Leiden des jungen Werther* [*The sufferings of young Werther*], written in 1774 and loosely based on the case of a friend of the author's, described the inner turmoil of Werther as he anguishes over his unrequited love for Lotte. "The effect on the book's first readers was overwhelming. The novel inspired not just emotion but emulation, in a wave of suicides similarly costumed [as Werther was], blue coat, yellow waistcoat" (170).

Present-day evidence suggests that the effect of media reporting in encouraging imitation suicides depends largely on the manner of reporting – the tone and language used, how the reports are highlighted, and whether accompanying graphic or other inappropriate material is used. The concern is that the extreme vulgarization of reporting of suicides may create a suicide culture, in which

suicide is seen as a normal and acceptable way of leaving a difficult world.

Responsible reporting of suicides by the media is seen as absolutely imperative, and any way of achieving it is to be welcomed. Various organizations and governments have proposed guidelines for reporting suicidal behaviour, including Befrienders International in the United Kingdom, the Centers for Disease Control and Prevention in the United States, the World Health Organization, and the Australian and New Zealand governments (171).

Intervention after a suicide

The loss of a person by suicide can arouse different feelings of grief in the relatives and close friends of those who have committed suicide than the feelings they experience when death is from natural causes. In general, there is still a taboo attached to the discussion of suicide and those bereaved by suicide may have less opportunity to share their grief with others. Communicating one's feelings is an important part of the healing process. For this reason, support groups serve an important role. In 1970, the first self-help support groups for the relatives and friends of people who have committed suicide started up in North America (172). Similar groups were subsequently established in various countries around the world. Self-help support groups are run by their members, but with access to outside help and resources. Such self-help groups appear to be beneficial for those who have lost someone through

suicide. The common experience of loss by suicide bonds people and encourages them to communicate their feelings (172).

Policy responses

In 1996, the United Nations Department for Policy Coordination and Sustainable Development brought out a document highlighting the importance of a guiding policy on suicide prevention (173). The World Health Organization subsequently issued a series of documents on the prevention of suicide (171, 172, 174–177), and two publications on mental, neurological and psychosocial disorders (41, 178). Other reports and guidelines on suicide prevention have also been developed (179).

In 1999, the World Health Organization launched a global initiative for the prevention of suicide, with the following objectives:

- To bring about a lasting reduction in the frequency of suicidal behaviours, with emphasis on developing countries and countries in social and economic transition.
- To identify, assess and eliminate at an early stage, as far as possible, factors that may result in young people taking their own lives.
- To raise the general awareness about suicide and provide psychosocial support to people with suicidal thoughts or experiences of attempted suicide, as well as to the friends and relatives of those who have attempted or completed suicide.

The main strategy for the implementation of this global initiative has two strands, along the lines of the World Health Organization's primary health care strategy:

- The organization of global, regional and national multisectoral activities to increase awareness about suicidal behaviours and how to effectively prevent them.
- The strengthening of countries' capabilities to develop and evaluate national policies and plans for suicide prevention, which may include:
 - support and treatment of populations at risk, such as people with depression, the elderly and young people;

- reduction of the availability of and access to means of suicide, for example, toxic substances;
- support for and strengthening of networks for survivors of suicide;
- training of primary health care workers and workers in other relevant sectors.

The initiative has now been complemented by a study which seeks to identify specific risk factors and specific interventions that are effective in reducing suicidal behaviours.

Recommendations

Several important recommendations for reducing both fatal and non-fatal suicidal behaviour can be drawn from this chapter.

Better data

There is an urgent need for more information on the causes of suicide, nationally and internationally, particularly among minority groups. Cross-cultural studies should be encouraged. They can lead to a better understanding of the causative and protective factors, and consequently can help improve prevention efforts. The following are some specific recommendations for better information on suicide:

- Governments should be encouraged to collect data on both fatal and non-fatal suicidal behaviour and to make such data available to the World Health Organization. Hospitals and other social and medical services should be strongly encouraged to keep records of non-fatal suicidal behaviour.
- Data on suicide and attempted suicide should be valid and up to date. There should be a set of uniform criteria and definitions and – once established – these should be consistently applied and continually reviewed.
- Data collection should be organized so as to avoid duplication of statistical records; at the same time, information should be easily accessible for researchers conducting analytical and epidemiological surveys.
- Efforts should be made to improve data linkage across a variety of agencies, including hospi-

tals, psychiatric and other medical institutions, and coroners' and police departments.

- All health professionals and officials in relevant agencies should be trained to detect and refer people at risk of suicidal behaviour, and to code such cases appropriately in data collection systems.
- There is a need to collect information on social indicators – such as quality-of-life indicators, divorce rates, and social and demographic changes – in tandem with data on suicidal behaviour, in order to improve the current understanding of the problem.

Further research

More research should be conducted to examine the relative contribution of psychosocial and biological factors in suicidal behaviour. A greater coupling of the two types of factor in research programmes would allow for major advances in the current knowledge on suicide. One particularly promising area is the rapidly expanding research in molecular genetics, where among other things there is now greater knowledge relating to the control of serotonin metabolism.

More clinical research should be carried out on the causative role of co-morbid conditions, for example the interaction between depression and alcohol abuse. There should also be a greater focus on subgroups of the population based on age (since suicide among the elderly has different features from that in young people), personality and temperament. Brain imaging is another area that calls for more research effort. Finally, there should be more research on the role of hostility, aggression and impulsivity in suicidal behaviour.

Better psychiatric treatment

The considerable contribution that psychiatric factors make towards suicidal behaviour suggests that improving treatment for those with psychiatric disturbances is important in preventing suicide. In this respect, the following steps should be taken:

- Pharmaceutical companies should be urged to develop more medications that are effective for psychiatric disorders. The advent of

selective serotonin reuptake inhibitors, for instance, may have brought about a decline in suicide rates in Scandinavia (180).

- Research funding should be directed towards devising more effective techniques of psychotherapy and counselling for suicidal individuals. In particular, there should be more specific techniques for those people whose personality disorders are closely associated with suicidal behaviour.
- Many more people need to be made aware of the signs and symptoms of suicidal behaviour and of where help, if needed, can be obtained – whether from family and friends, doctors, social workers, religious leaders, employers or teachers and other school staff. Doctors and other health care providers, in particular, should be educated and trained to recognize, refer and treat those with psychiatric disorders, especially affective disorders.
- An urgent priority for governments and their health care planning departments is the early identification and treatment of individuals suffering not only from mental disorders but also from drug and alcohol abuse and dependence. The programme set up in Gotland, Sweden, by Rutz (181) may provide a useful model for other countries to follow.

Environmental changes

A range of environmental changes are suggested for restricting access to methods of suicide, including:

- Fencing in high bridges.
- Limiting access to the roofs and high exteriors of tall buildings.
- Obliging car manufacturers to change the shape of exhaust pipes of vehicles and to introduce a mechanism by which the engine automatically turns off after running idle for a specified time.
- Restricting access by people other than farmers to pesticides and fertilizers.
- Where potentially lethal medications are concerned:
 - requiring strict monitoring of prescriptions by doctors and pharmacists;

- reducing the maximum size of prescriptions;
- packaging medications in plastic blisters;
- where possible, prescribing medication in the form of suppositories.
- Reducing access to guns among groups at risk for suicide.

Strengthening community-based efforts

Local communities are important settings for existing suicide prevention activities, though much more can be done to strengthen community-based efforts. In particular, attention should be given to:

- Developing and evaluating community-based programmes.
- Improving the quality of services for existing programmes.
- Greater government funding and more professional support by governments for activities such as:
 - suicide prevention centres;
 - support groups for people who have experienced the suicide of someone very close to them (such as a child, an intimate partner or a parent) and who may thus themselves be at a heightened risk for suicide;
 - reducing social isolation, by promoting community-based programmes such as youth centres and centres for older people.
- Establishing partnerships and improving collaboration between the relevant agencies.
- Devising educational programmes to prevent suicidal behaviour, not only for schools, as is mainly the case at present, but also for workplaces and other settings in communities.

Conclusion

Suicide is one of the leading causes of death worldwide and is an important public health problem. Suicide and attempted suicide are complex phenomena that arise, in very individualistic ways, from the interplay of biological, psychological, psychiatric and social factors. The complexity of causes necessarily requires a multifaceted approach to prevention that takes into account

cultural context. Cultural factors play a major role in suicidal behaviour (182), producing large differences in the characteristics of this problem around the world (183). Given these differences, what has a positive effect in preventing suicide in one place may be ineffective or even counterproductive in another cultural setting.

Major investment is needed, both for research and for preventive efforts. While short-term efforts contribute to an understanding of why suicide occurs and what can be done to prevent it, longitudinal research studies are necessary to fully understand the role of biological, psychosocial and environmental factors in suicide. There is also a great need for rigorous and long-term evaluations of interventions. To date, most projects have been of short duration with little, if any, evaluation.

Finally, suicide prevention efforts will be ineffective if they are not set within the framework of large-scale plans developed by multidisciplinary teams, comprising government officials, health care planners and health care workers, and researchers and practitioners from a variety of disciplines and sectors. Major investments in planning, resources and collaboration between these groups will go a long way towards reducing this important public health problem.

References

1. *Injury: a leading cause of the global burden of disease*. Geneva, World Health Organization, 1999 (document WHO/HSC/PVI/99.11).
2. Moscicki EK. Epidemiology of suicidal behavior. In: Silverman MM, Maris RW, eds. *Suicide prevention: toward the year 2000*. New York, NY, Guilford, 1985:22–35.
3. Stoudemire A et al. The economic burden of depression. *General Hospital Psychiatry*, 1986, 8:387–394.
4. Minois G. *History of suicide: voluntary death in Western culture*. Baltimore, MD, Johns Hopkins University Press, 1999.
5. Shneidman E. *Definition of suicide*. New York, NY, John Wiley & Sons, 1985.
6. Canetto SS, Lester D. *Women and suicidal behavior*. New York, NY, Springer, 1995.
7. Paykel ES et al. Suicidal feelings in the general population: a prevalence study. *British Journal of Psychiatry*, 1974, 124:460–469.

8. Kessler RC, Borges G, Walters EE. Prevalence and risk factors for lifetime suicide attempts in the National Comorbidity Survey. *Archives of General Psychiatry*, 1999, 56:617–626.
9. Favazza A. Self-mutilation. In: Jacobs DG, ed. *The Harvard Medical School guide to suicide assessment and intervention*. San Francisco, CA, Jossey-Bass Publishers, 1999:125–145.
10. Gururaj G et al. *Suicide prevention: emerging from darkness*. New Delhi, WHO Regional Office for South-East Asia, 2001.
11. Lester D. *Patterns of suicide and homicide in the world*. Commack, NY, Nova Science, 1996.
12. Lester D, Yang B. *Suicide and homicide in the 20th century*. Commack, NY, Nova Science, 1998.
13. Girard C. Age, gender and suicide. *American Sociological Review*, 1993, 58:553–574.
14. Booth H. Pacific Island suicide in comparative perspective. *Journal of Biosocial Science*, 1999, 31:433–448.
15. Yip PSF. Suicides in Hong Kong, Taiwan and Beijing. *British Journal of Psychiatry*, 1996, 169: 495–500.
16. Lester D. *Suicide in African Americans*. Commack, NY, Nova Science, 1998.
17. Wasserman D, Varnik A, Dankowicz M. Regional differences in the distribution of suicide in the former Soviet Union during perestroika, 1984–1990. *Acta Psychiatrica Scandinavica Supplementum*. 1998, 394:5–12.
18. Yip PSF, Tan RC. Suicides in Hong Kong and Singapore: a tale of two cities. *International Journal of Social Psychiatry*, 1998, 44:267–279.
19. Hunter EM. An examination of recent suicides in remote Australia. *Australian and New Zealand Journal of Psychiatry*, 1991, 25:197–202.
20. Cheng TA, Hsu MA. A community study of mental disorders among four aboriginal groups in Taiwan. *Psychological Medicine*, 1992, 22:255–263.
21. Lester D. *Suicide in American Indians*. Commack, NY, Nova Science, 1997.
22. Baume PJM, Cantor CH, McTaggart PG. *Suicides in Queensland: a comprehensive study, 1990–1995*. Brisbane, Australian Institute for Suicide Research and Prevention, 1997.
23. Kermayer L, Fletcher C, Boothroyd L. Suicide among the Inuit of Canada. In: Leenaars A et al., eds. *Suicide in Canada*. Toronto, University of Toronto Press, 1998:189–211.
24. Graham A et al. Suicide: an Australian Psychological Society discussion paper. *Australian Psychologist*, 2000, 35:1–28.
25. Yip PSF, Yam CH, Chau PH. A re-visit on seasonal variations in the Hong Kong Special Administrative Region (HKSAR). *Acta Psychiatrica Scandinavica*, 2001, 103:315–316.
26. Ji JL, Kleinman A, Becker AE. Suicide in contemporary China: a review of China's distinctive suicide demographics in their socio-cultural context. *Harvard Review of Psychiatry*, 2001, 9:1–12.
27. Cooper PN, Milroy CM. The coroner's system and underreporting of suicide. *Medicine, Science and the Law*, 1995, 35:319–326.
28. De Leo D, Diekstra RFW. *Depression and suicide in late life*. Toronto and Bern, Hogrefe/Huber, 1990.
29. Sayer G, Stewart G, Chipps J. Suicide attempts in NSW: associated mortality and morbidity. *Public Health Bulletin*, 1996, 7:55–63.
30. Kjoller M, Helveg-Larsen M. Suicidal ideation and suicide attempts among adult Danes. *Scandinavian Journal of Public Health*, 2000, 28:54–61.
31. Diekstra RF, Garnefski N. On the nature, magnitude, and causality of suicidal behaviors: an international perspective. *Suicide and Life-Threatening Behavior*, 1995, 25:36–57.
32. McIntire MS, Angle CR. The taxonomy of suicide and self-poisoning: a pediatric perspective. In: Wells CF, Stuart IR, eds. *Self-destructive behavior in children and adolescents*. New York, NY, Van Nostrand Reinhold, 1981:224–249.
33. McIntosh JL et al. *Elder suicide: research, theory and treatment*. Washington, DC, American Psychological Association, 1994.
34. De Leo D et al. Attempted and completed suicide in older subjects: results from the WHO/EURO Multicentre Study of Suicidal Behaviour. *International Journal of Geriatric Psychiatry*, 2001, 16:1–11.
35. Schmidtke A et al. Attempted suicide in Europe: rates, trends and sociodemographic characteristics of suicide attempters during the period 1989–1992. Results of the WHO/EURO Multicentre Study on Parasuicide. *Acta Psychiatrica Scandinavica*, 1996, 93:327–338.
36. Wichstrom L. Predictors of adolescent suicide attempts: a nationally representative longitudinal study of Norwegian adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry*, 2000, 39:603–610.
37. Linden M, Barnow S. The wish to die in very old persons near the end of life: a psychiatric problem? Results from the Berlin Ageing Study (BASE). *International Psychogeriatrics*, 1997, 9:291–307.
38. Scocco P et al. Death ideation and its correlates: survey of an over-65-year-old population. *Journal of Mental and Nervous Disease*, 2001, 189:209–218.
39. Isometsa ET, Lonnqvist JK. Suicide in mood disorders. In: Botsis AL, Soldatos CR, Stefanis CN,

- eds. *Suicide: biopsychosocial approaches*. Amsterdam, Elsevier, 1997:33–46.
40. Waern M et al. Suicidal feelings in the last year of life in elderly people who commit suicide. *Lancet*, 1999, 354:917–918.
41. *Primary prevention of mental, neurological and psychosocial disorders*. Geneva, World Health Organization, 1998.
42. Blumenthal SJ. Suicide: a guide to risk factors, assessment, and treatment of suicidal patients. *Medical Clinics of North America*, 1988, 72:937–971.
43. Beck AT et al. The relationship between hopelessness and ultimate suicide: a replication with psychiatric outpatients. *American Journal of Psychiatry*, 1990, 147:190–195.
44. Guze SB, Robins E. Suicide and primary affective disorders. *British Journal of Psychiatry*, 1970, 117:437–438.
45. Harris EC, Barraclough B. Suicide as an outcome for mental disorders. *British Journal of Psychiatry*, 1997, 170:447–452.
46. Botswick JM, Pankratz VS. Affective disorders and suicide risk: a re-examination. *American Journal of Psychiatry*, 2000, 157:1925–1932.
47. Roy A. Suicide in schizophrenia. In: Roy A, ed. *Suicide*. Baltimore, MD, Williams & Wilkins, 1986:97–112.
48. Caldwell CB, Gottesman II. Schizophrenics kill themselves too: a review of risk factors for suicide. *Schizophrenia Bulletin*, 1990, 16:571–589.
49. Beck AT et al. Hopelessness and eventual suicide: a 10-year prospective study of patients hospitalized with suicidal ideation. *American Journal of Psychiatry*, 1985, 142:559–563.
50. Murphy GE, Wetzel RD. The life-time risk of suicide in alcoholism. *Archives of General Psychiatry*, 1990, 47:383–392.
51. Yip PSF et al. *Teenage suicide in Hong Kong*. Hong Kong SAR, China, Befrienders International, 1998.
52. Hawton K, Catalan J. *Attempted suicide: a practical guide to its nature and management*, 2nd ed. Oxford, Oxford University Press, 1987.
53. Gunnell D, Frankel S. Prevention of suicide: aspiration and evidence. *British Medical Journal*, 1994, 308:1227–1233.
54. Roy A. Genetics, biology and suicide in the family. In: Maris RW et al., eds. *Assessment and prediction of suicide*. New York, NY, Guilford, 1992:574–588.
55. Schulsinger F et al. A family study of suicide. In: Schou M, Stromgren E, eds. *Origin, prevention and treatment of affective disorders*. London, Academic Press, 1979:227–287.
56. Asberg M, Traskman L, Thoren P. 5-HIAA in the cerebrospinal fluid. A biochemical suicide predictor? *Archives of General Psychiatry*, 1976, 33:1193–1197.
57. Lester D. The concentration of neurotransmitter metabolites in the cerebrospinal fluid of suicidal individuals: a meta-analysis. *Pharmacopsychiatry*, 1995, 28:45–50.
58. Coccaro EF et al. Serotonergic studies in patients with affective and personality disorders. *Archives of General Psychiatry*, 1989, 46:587–599.
59. Mann JJ et al. Relationship between central and peripheral serotonin indexes in depressed and suicidal psychiatric inpatients. *Archives of General Psychiatry*, 1992, 49:442–446.
60. Mann JJ. The neurobiology of suicide. *Nature Medicine*, 1998, 4:25–30.
61. Van Praag H. Suicide and aggression. In: Lester D, ed. *Suicide prevention*. Philadelphia, Brunner-Routledge, 2000:45–64.
62. Chi I, Yip PSF, Yu KK. *Elderly suicide in Hong Kong*. Hong Kong SAR, China, Befrienders International, 1998.
63. De Leo D et al. Physical illness and parasuicide: evidence from the European Parasuicide Study Interview (EPSIS/WHO-EURO). *International Journal of Psychiatry in Medicine*, 1999, 29:149–163.
64. Appleby L et al. Psychological autopsy study of suicides by people aged under 35. *British Journal of Psychiatry*, 1999, 175:168–174.
65. Beautrais AL, Joyce PR, Mulder RT. Precipitating factors and life events in serious suicide attempts among youths aged 13 through 24 years. *Journal of the American Academy of Child and Adolescent Psychiatry*, 1997, 36:1543–1551.
66. Foster T et al. Risk factors for suicide independent of DSM-III-R Axis I disorder. Case-control psychological autopsy study in Northern Ireland. *British Journal of Psychiatry*, 1999, 175:175–179.
67. Heikkinen ME et al. Age-related variation in recent life events preceding suicide. *Journal of Nervous and Mental Disease*, 1995, 183:325–331.
68. Kaltiala-Heino R et al. Bullying, depression and suicidal ideation in Finnish adolescents: school survey. *British Medical Journal*, 1999, 319:348–351.
69. Cavanagh JT, Owens DG, Johnstone EC. Life events in suicide and undetermined death in south-east Scotland: a case-control study using the method of psychological autopsy. *Social Psychiatry and Psychiatric Epidemiology*, 1999, 34:645–650.
70. Thacore VR, Varma SL. A study of suicides in Ballarat, Victoria, Australia. *Crisis*, 2000, 21:26–30.
71. Kernic MA, Wolf ME, Holt VL. Rates and relative risk of hospital admission among women in violent intimate partner relationships. *American Journal of Public Health*, 2000, 90:1416–1420.

72. Olson L et al. Guns, alcohol and intimate partner violence: the epidemiology of female suicide in New Mexico. *Crisis*, 1999, 20:121–126.
73. Thompson MP et al. Partner abuse and post-traumatic stress disorder as risk factors for suicide attempts in a sample of low-income, inner-city women. *Journal of Trauma and Stress*, 1999, 12:59–72.
74. Fischbach RL, Herbert B. Domestic violence and mental health: correlates and conundrums within and across cultures. *Social Science in Medicine*, 1997, 45:1161–1176.
75. Brown J et al. Childhood abuse and neglect: specificity of effects on adolescent and young adult depression and suicidality. *Journal of the American Academy of Child and Adolescent Psychiatry*, 1999, 38:1490–1496.
76. Dinwiddie S et al. Early sexual abuse and lifetime psychopathology: a co-twin control study. *Psychological Medicine*, 2000, 30:41–52.
77. Santa Mina EE, Gallop RM. Childhood sexual and physical abuse and adult self-harm and suicidal behaviour: a literature review. *Canadian Journal of Psychiatry*, 1998, 43:793–800.
78. Garnefski N, Arends E. Sexual abuse and adolescent maladjustment: differences between male and female victims. *Journal of Adolescence*, 1998, 21:99–107.
79. Silverman AB, Reinherz HZ, Giaconia RM. The long-term sequelae of child and adolescent abuse: a longitudinal community study. *Child Abuse & Neglect*, 1996, 20:709–723.
80. Fergusson DM, Horwood LJ, Beautrais AL. Is sexual orientation related to mental health problems and suicidality in young people? *Archives of General Psychiatry*, 1999, 56:876–880.
81. Herrell R et al. Sexual orientation and suicidality: a co-twin control study in adult men. *Archives of General Psychiatry*, 1999, 56:867–874.
82. Gibson P. Gay male and lesbian youth suicide. In: Feinleib MR, ed. *Report of the Secretary's Task Force on Youth Suicide. Volume 3. Prevention and interventions in youth suicide*. Washington, DC, United States Department of Health and Human Services, 1989 (DHHS publication ADM 89-1623):110–137.
83. Shaffer D et al. Sexual orientation in adolescents who commit suicide. *Suicide and Life-Threatening Behavior*, 1995, 25(Suppl.):64–71.
84. Millard J. Suicide and suicide attempts in the lesbian and gay community. *Australian and New Zealand Mental Health Nursing*, 1995, 4:181–189.
85. Stronski Huwiler SM, Remafedi G. Adolescent homosexuality. *Advances in Pediatrics*, 1998, 45:107–144.
86. Clark DC, Fawcett J. Review of empirical risk factors for evaluation of the suicidal patient. In: Bongar B, ed. *Suicide: guidelines for assessment, management and treatment*. New York, NY, Oxford University Press, 1992:16–48.
87. Kposowa AJ. Marital status and suicide in the National Longitudinal Mortality Study. *Journal of Epidemiology and Community Health*, 2000, 54:254–261.
88. Smith JC, Mercy JA, Conn JM. Marital status and the risk of suicide. *American Journal of Public Health*, 1998, 78:78–80.
89. Cantor CH, Slater PJ. Marital breakdown, parenthood and suicide. *Journal of Family Studies*, 1995, 1:91–102.
90. Yip PSF. Age, sex, marital status and suicide: an empirical study of east and west. *Psychological Reports*, 1998, 82:311–322.
91. Thompson N, Bhugra D. Rates of deliberate self-harm in Asians: findings and models. *International Review of Psychiatry*, 2000, 12:37–43.
92. Khan MM, Reza H. Gender differences in nonfatal suicidal behaviour in Pakistan: significance of sociocultural factors. *Suicide and Life-Threatening Behavior*, 1998, 28:62–68.
93. Khan MM, Reza H. The pattern of suicide in Pakistan. *Crisis*, 2000, 21:31–35.
94. Durkheim E. *Le Suicide. [Suicide.]* Paris, Alcan, 1897.
95. Heikkinen HM, Aro H, Lonnqvist J. Recent life events, social support and suicide. *Acta Psychiatrica Scandinavica*, 1993, 377(Suppl.):65–72.
96. Heikkinen HM, Aro H, Lonnqvist J. Life events and social support in suicide. *Suicide and Life-Threatening Behavior*, 1994, 23:343–358.
97. Kreitman N. *Parasuicide*. Chichester, John Wiley & Sons, 1977.
98. Magne-Ingvar U, Ojehagen A, Traskman-Bendz L. The social network of people who attempt suicide. *Acta Psychiatrica Scandinavica*, 1992, 86:153–158.
99. Maris RW. *Pathways to suicide: a survey of self-destructive behaviors*. Baltimore, MD, Johns Hopkins University Press, 1981.
100. Negron R et al. Microanalysis of adolescent suicide attempters and ideators during the acute suicidal episode. *Journal of the American Academy of Child and Adolescent Psychiatry*, 1997, 36:1512–1519.
101. Wenz F. Marital status, anomie and forms of social isolation: a case of high suicide rate among the widowed in urban sub-area. *Diseases of the Nervous System*, 1977, 38:891–895.

102. Draper B. Attempted suicide in old age. *International Journal of Geriatric Psychiatry*, 1996, 11:577–587.
103. Dennis MS, Lindsay J. Suicide in the elderly: the United Kingdom perspective. *International Psychogeriatrics*, 1995, 7:263–274.
104. Hawton K, Fagg J, Simkin S. Deliberate self-poisoning and self-injury in children and adolescents under 16 years of age in Oxford 1976–93. *British Journal of Psychiatry*, 1996, 169:202–208.
105. *National injury mortality reports, 1987–1998*. Atlanta, GA, Centers for Disease Control and Prevention, 2000.
106. Zhang J. Suicide in Beijing, China, 1992–1993. *Suicide and Life-Threatening Behavior*, 1996, 26:175–180.
107. Yip PSF. An epidemiological profile of suicide in Beijing, China. *Suicide and Life-Threatening Behavior*, 2001, 31:62–70.
108. De Leo D et al. *Hanging as a means to suicide in young Australians: a report to the Commonwealth Ministry of Health and Family Services*. Brisbane, Australian Institute for Suicide Research and Prevention, 1999.
109. Schmidtke A, Hafner H. The Werther effect after television films: new evidence for an old hypothesis. *Psychological Medicine*, 1998, 18:665–676.
110. Wasserman I. Imitation and suicide: a re-examination of the Werther effect. *American Sociological Review*, 1984, 49:427–436.
111. Mazurk PM et al. Increase of suicide by asphyxiation in New York City after the publication of “Final Exit”. *New England Journal of Medicine*, 1993, 329:1508–1510.
112. De Leo D, Ormskerk S. Suicide in the elderly: general characteristics. *Crisis*, 1991, 12:3–17.
113. *Rates of suicide throughout the country: fact sheet*. Washington, DC, American Association of Suicidology, 1999.
114. Dudley MJ et al. Suicide among young Australians, 1964–1993: an interstate comparison of metropolitan and rural trends. *Medical Journal of Australia*, 1998, 169:77–80.
115. Hawton K et al. *Suicide and stress in farmers*. London, The Stationery Office, 1998.
116. Bowles JR. Suicide in Western Samoa: an example of a suicide prevention program in a developing country. In: Diekstra RFW et al., eds. *Preventive strategies on suicide*. Leiden, Brill, 1995:173–206.
117. Cantor CH et al. *The epidemiology of suicide and attempted suicide among young Australians: a report to the NH-MRC*. Brisbane, Australian Institute for Suicide Research and Prevention, 1998.
118. Baume P, Cantor CH, McTaggart P. *Suicide in Queensland, 1990–1995*. Queensland, Australian Institute for Suicide Research and Prevention, 1998.
119. Platt S. Unemployment and suicidal behaviour: a review of the literature. *Social Science and Medicine*, 1984, 19:93–115.
120. Varnik A, Wasserman D, Eklund G. Suicides in the Baltic countries. *Scandinavian Journal of Social Medicine*, 1994, 22:166–169.
121. Kalediene R. Time trends in mortality in Lithuania. *Acta Psychiatrica Scandinavica*, 1999, 99:419–422.
122. Weyerer S, Wiedenmann A. Economic factors and the rate of suicide in Germany between 1881 and 1989. *Psychological Report*, 1995, 76:1331–1341.
123. Lopatin AA, Kokorina NP. The widespread nature of suicide in Kuzbass (Russia). *Archives of Suicide Research*, 1998, 3:225–234.
124. Berk JH. Trauma and resilience during war: a look at the children and humanitarian aid workers in Bosnia. *Psychoanalytical Review*, 1998, 85:648–658.
125. Yip PSF. Suicides in Hong Kong. *Social Psychiatry and Psychiatric Epidemiology*, 1997, 32:243–250.
126. Morrell S et al. Suicide and unemployment in Australia 1907–1990. *Social Science and Medicine*, 1993, 36:749–756.
127. Fergusson DM, Horwood IJ, Lynskey MT. The effects of unemployment on psychiatric illness during young adulthood. *Psychological Medicine*, 1997, 27:371–381.
128. Beautrais AL, Joyce PR, Mulder RT. Unemployment and serious suicide attempts. *Psychological Medicine*, 1998, 28:209–218.
129. Lester D. Religion, suicide and homicide. *Social Psychiatry*, 1987, 22:99–101.
130. Faupel CE, Kowalski GS, Starr PD. Sociology’s one law: religion and suicide in the urban context. *Journal for the Scientific Study of Religion*, 1987, 26:523–534.
131. Burr JA, McCall PL, Powell-Griner E. Catholic religion and suicide: the mediating effect of divorce. *Social Science Quarterly*, 1994, 75:300–318.
132. Bankston WB, Allen HD, Cunningham DS. Religion and suicide: a research note on “Sociology’s One Law”. *Social Forces*, 1983, 62:521–528.
133. Pope W, Danigelis N. Sociology’s “one law”. *Social Forces*, 1981, 60:495–516.
134. Simpson ME, Conlin GH. Socioeconomic development, suicide and religion: a test of Durkheim’s theory of religion and suicide. *Social Forces*, 1989, 67:945–964.
135. Stack S, Wasserman I. The effect of religion on suicide ideology: an analysis of the networks perspective. *Journal for the Scientific Study of Religion*, 1992, 31:457–466.

136. Stack S. The effect of religious commitment of suicide: a cross-national analysis. *Journal of Health and Social Behaviour*, 1983, 24:362–374.
137. Kok LP. Race, religion and female suicide attempters in Singapore. *Social Psychiatry and Psychiatric Epidemiology*, 1998, 40:236–239.
138. Neeleman J, Wessely S, Lewis G. Suicide acceptability in African and white Americans: the role of religion. *Journal of Nervous and Mental Disease*, 1998, 186:12–16.
139. Marzuk PM et al. Lower risk of suicide during pregnancy. *American Journal of Psychiatry*, 1997, 154:122–123.
140. Nisbet PA. Protective factors for suicidal black females. *Suicide and Life-Threatening Behavior*, 1996, 26:325–340.
141. Resnick MD et al. Protecting adolescents from harm: findings from the National Longitudinal Study on Adolescent Health. *Journal of the American Medical Association*, 1997, 278:823–832.
142. McKeown RE et al. Incidence and predictors of suicidal behaviors in a longitudinal sample of young adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry*, 1998, 37:612–619.
143. Botsis AJ. Suicidal behaviour: risk and protective factors. In: Botsis AJ, Soldatos CR, Stefanis CN, eds. *Suicide: biopsychosocial approaches*. Amsterdam, Elsevier Science, 1997:129–146.
144. Pfeffer CR, Hurt SW, Peskin JR. Suicidal children grow up: ego functions associated with suicide attempts. *Journal of the American Academy of Child and Adolescent Psychiatry*, 1995, 34:1318–1325.
145. Borowsky IW et al. Suicide attempts among American Indian and Alaska Native youth: risk and protective factors. *Archives of Pediatrics and Adolescent Medicine*, 1999, 153:573–580.
146. Goldney RD. Prediction of suicide and attempted suicide. In: Hawton K, van Heeringen K, eds. *The international handbook of suicide and attempted suicide*. Chichester, John Wiley & Sons, 2000: 585–595.
147. Verkes RJ et al. Reduction by paroxetine of suicidal behaviour in patients with repeated suicide attempts but not with major depression. *American Journal of Psychiatry*, 1998, 155:543–547.
148. Linehan MM. Behavioral treatments of suicidal behaviors: definitional obfuscation and treatment outcomes. In: Stoff DM, Mann JJ, eds. *The neurobiology of suicide: from the bench to the clinic*. New York, NY, New York Academy of Sciences, 1997:302–328.
149. Salkovskis PM, Atha C, Storer D. Cognitive behavioural problem-solving in the treatment of patients who repeatedly attempt suicide: a controlled trial. *British Journal of Psychiatry*, 1990, 157:871–876.
150. Linehan MM, Heard HL, Armstrong HE. Naturalistic follow-up of a behavioural treatment for chronically parasuicidal borderline patients. *Archives of General Psychiatry*, 1993, 50:971–974.
151. MacLeod AK et al. Recovery of positive future thinking within a high-risk parasuicide group: results from a pilot randomised controlled trial. *British Journal of Clinical Psychology*, 1998, 37:371–379.
152. Morgan HG, Jones EM, Owen JH. Secondary prevention of non-fatal deliberate self-harm. The Green Card Study. *British Journal of Psychiatry*, 1993, 163:111–112.
153. Cotgrove A et al. Secondary prevention of attempted suicide in adolescence. *Journal of Adolescence*, 1995, 18:569–577.
154. Evans MO et al. Crisis telephone consultation for deliberate self-harm patients: effects on repetition. *British Journal of Psychiatry*, 1999, 175:23–27.
155. De Leo D, Carollo G, Dello Buono M. Lower suicide rates associated with a tele-help/tele-check service for the elderly at home. *American Journal of Psychiatry*, 1995, 152:632–634.
156. Litman RE, Wold CI. Beyond crisis intervention. In: Schneidman ES, ed. *Suicidology, contemporary developments*. New York, NY, Grune & Stratton, 1976:528–546.
157. Gibbons JS et al. Evaluation of a social work service for self-poisoning patients. *British Journal of Psychiatry*, 1978, 133:111–118.
158. Hawton K et al. Evaluation of outpatient counselling compared with general practitioner care following overdoses. *Psychological Medicine*, 1987, 17: 751–761.
159. Dew MA et al. A quantitative literature review of the effectiveness of suicide prevention centers. *Journal of Consulting and Clinical Psychology*, 1987, 55:239–244.
160. Lester D. The effectiveness of suicide prevention centres: a review. *Suicide and Life-Threatening Behavior*, 1997, 27:304–310.
161. Riehl T, Marchner E, Moller HJ. Influence of crisis intervention telephone services (“crisis hotlines”) on the suicide rate in 25 German cities. In: Moller HJ, Schmidtke A, Welz R, eds. *Current issues of suicidology*. New York, NY, Springer Verlag, 1988:431–436.
162. Lester D. State initiatives in addressing youth suicide: evidence for their effectiveness. *Social Psychiatry and Psychiatric Epidemiology*, 1992, 27:75–77.

163. Oliver RG, Hetzel BS. Rise and fall of suicide rates in Australia: relation to sedative availability. *Medical Journal of Australia*, 1972, 2:919–923.
164. Kreitman N. The coal gas history: United Kingdom suicide rates, 1960–1971. *British Journal of Preventive and Social Medicine*, 1972, 30:86–93.
165. Lester D. Preventing suicide by restricting access to methods for suicide. *Archives of Suicide Research*, 1998, 4:7–24.
166. Clarke RV, Lester D. Toxicity of car exhausts and opportunity for suicide. *Journal of Epidemiology and Community Health*, 1987, 41:114–120.
167. Lester D, Murrell ME. The influence of gun control laws on suicidal behaviour. *American Journal of Psychiatry*, 1980, 80:151–154.
168. Kellerman AL et al. Suicide in the home in relation to gun ownership. *New England Journal of Medicine*, 1992, 327:467–472.
169. Carrington PJ, Moyer MA. Gun control and suicide in Ontario. *American Journal of Psychiatry*, 1994, 151:606–608.
170. Reed TJ. *Goethe*. Oxford, Oxford University Press, 1984 (Past Masters Series).
171. *Preventing suicide: a resource for media professionals*. Geneva, World Health Organization, 2000 (document WHO/MNH/MBD/00.2).
172. *Preventing suicide: how to start a survivors group*. Geneva, World Health Organization, 2000 (document WHO/MNH/MBD/00.6).
173. *Prevention of suicide: guidelines for the formulation and implementation of national strategies*. New York, NY, United Nations, 1996 (document ST/SEA/245).
174. *Preventing suicide: a resource for general physicians*. Geneva, World Health Organization, 2000 (document WHO/MNH/MBD/00.1).
175. *Preventing suicide: a resource for teachers and other school staff*. Geneva, World Health Organization, 2000 (document WHO/MNH/MBD/00.3).
176. *Preventing suicide: a resource for primary health care workers*. Geneva, World Health Organization, 2000 (document WHO/MNH/MBD/00.4).
177. *Preventing suicide: a resource for prison officers*. Geneva, World Health Organization, 2000 (document WHO/MNH/MBD/00.5).
178. *The world health report 2001. Mental health: new understanding, new hope*. Geneva, World Health Organization, 2001.
179. United States Public Health Service. *The Surgeon General's call to action to prevent suicide*. Washington, DC, United States Department of Health and Human Services, 1999.
180. Isacson G. Suicide prevention: a medical breakthrough? *Acta Psychiatrica Scandinavica*, 2000, 102:113–117.
181. Rutz W. The role of family physicians in preventing suicide. In: Lester D, ed. *Suicide prevention: resources for the millennium*. Philadelphia, PA, Brunner-Routledge, 2001:173–187.
182. De Leo D. Cultural issues in suicide and old age. *Crisis*, 1999, 20:53–55.
183. Schmidtke A et al. Suicide rates in the world: an update. *Archives of Suicide Research*, 1999, 5:81–89.