

# Trends in deliberate self-harm in Oxford, 1985–1995

## Implications for clinical services and the prevention of suicide

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**Background** Deliberate self-harm (DSH) has been a major health problem in the UK for nearly three decades. Any changes in rates of DSH or the demographic characteristics of the patient population are likely to have important implications for clinical services and suicide prevention.

**Method** Data collected by the Oxford Monitoring System for Attempted Suicide were used to review trends in DSH between 1985–1995.

**Results** There was a substantial increase in DSH rates during the 11-year study period, with a 62.1% increase in males and a 42.2% increase in females. The largest rise was in 15–24-year-old males (+194.1%). Changes in DSH rates correlated with changes in national suicide rates in both males and females in this age group. Rates of repetition of DSH increased in both genders during the study period. Paracetamol self-poisoning has continued to increase, half of all overdoses in 1995 involving paracetamol, and antidepressant overdoses have become more common.

**Conclusions** The increase in DSH, especially in young males, has important implications for general hospital DSH and medical services. It may herald a reversal of recent progress towards achievement of national suicide targets.

Rates of deliberate self-harm (DSH) (self-poisoning and self-injury) in the UK escalated during the late 1960s and early 1970s to such an extent that it became a major health problem (Bancroft *et al*, 1975; Holding *et al*, 1977). This problem was particularly marked in adolescents and young adults (Kreitman & Schreiber, 1979; Hawton & Goldacre, 1982). Following a decline in rates during the late 1970s and early 1980s, notably in older teenage girls (Sellar *et al*, 1990a; Platt *et al*, 1988), we subsequently reported that rates in Oxford had begun to rise again in the late 1980s (Hawton & Fagg, 1992a), especially in older adolescent females (Hawton & Fagg, 1992b). Subsequently, it became clear that the rates of DSH in the UK are among the highest in Europe (Schmidtke *et al*, 1996). Because of the size of the problem of DSH and its associated significant risk of suicide (Hawton & Fagg, 1988), any changes in its prevalence can have important clinical implications both for general medical and psychiatric services and for suicide prevention. The aims of this study were to review trends in DSH which are relevant to the prevention of self-harm and service provision for this population. In this paper we have utilised data collected through the Oxford Monitoring System for Attempted Suicide (Hawton & Fagg, 1992a) to review trends in DSH in Oxford during the 11 years 1985 to 1995.

### METHOD

The study population consisted of all persons referred to the general hospital in Oxford between 1985 and 1995 following self-poisoning or self-injury. The general hospital receives all hospital-referred cases from Oxford City and the surrounding area. Patients referred to the hospital following self-poisoning or self-injury are identified by the Monitoring System maintained by the University Department of Psychiatry (Hawton &

Fagg, 1992a). Most attempted suicide patients are routinely referred to the emergency psychiatric service in the hospital. All patients referred to the service receive a detailed psychosocial assessment by a specially trained psychiatrist, psychiatric nurse, or social worker. Most assessments are discussed in detail with a senior psychiatrist. A range of patient characteristics and clinical items are recorded by the assessors on data sheets which are then coded and the data entered into a computerised data file. Through scrutiny of the records of the accident and emergency department a limited amount of information is also available on patients presenting to the hospital but not seen by the psychiatric service. We have previously demonstrated the reliability of our method of data collection (Sellar *et al*, 1990b).

Self-poisoning is defined as the intentional self-administration of more than the prescribed dose of any drug whether or not there is evidence that the act was intended to cause self-harm. This category also includes overdoses of 'drugs for kicks' and poisoning by non-ingestible substances and gas, provided the hospital staff consider that these are cases of deliberate self-harm. Alcohol intoxication is not included unless accompanied by other types of self-poisoning or self-injury. Self-injury is defined as any injury recognised by hospital staff as having been deliberately self-inflicted.

### Calculation of rates

For those findings which are based on rates, the data have been analysed for referrals from Oxford City only. This is because the rest of the hospital catchment area is somewhat ill-defined; therefore rates can only be calculated for the City referrals. The population figures for Oxford City are mid-year estimates and were provided by the Office for National Statistics (formerly the Office for Population Censuses and Surveys). Age- and sex-specific rates per 100 000 population were calculated, using appropriate mid-year population estimates as the denominators.

In the calculation of annual rates and examination of trends in rates, each individual could only contribute to the data once in any one year. However, they were included in the calculations of rates for other years if they made further attempts in those years. Where findings for the whole study period are averaged this is either on the basis of persons, in which case each individual could only contribute to the data once (i.e. 'true' persons), or episodes.

## Clinical variables

Findings with regard to demographic variables, methods of self-harm, and repetition of attempts, are based on the total population of patients referred to the hospital. Most of the other clinical information was only available for patients assessed by the clinical service. We have reported on the problems patients referred in 1995 were facing, these problems being indicated by the clinical assessors on a standard checklist. A problem was defined as 'a factor which was causing current distress for the patient and/or contributed to the attempt'.

Repetition of attempts has been studied according to (a) previous attempts leading to hospital referral before the first referral during the study period, and (b) repeat attempts resulting in re-referral to the general hospital in Oxford during the year following the first referral in any one year (1985–1994 only).

## Suicide rates

Data on annual suicide rates for England and Wales were obtained from the Office for National Statistics. Rates of suicide in the category 'suicide' (E950–E959) and 'undetermined cause' (E980–E989) were combined to provide a more valid estimate of the overall rates of suicide (Charlton *et al*, 1992).

## Statistical analysis

The data were analysed with the SPSSX statistical package (SPSS, 1993) using  $\chi^2$  and Spearman's rho (two-tailed) tests where appropriate. In testing for trends the  $\chi^2$  test for trend was used where trends were approximately linear and  $\chi^2$  for proportions in grouped years where the trends were clearly non-linear.

## RESULTS

### Referrals to the general hospital

During the 11 years 1985 to 1995, 7437 persons presented to the hospital following 10 631 episodes of DSH (Table 1). There was an increase in both the annual number of persons (mean annual increase +4.6% per year) and episodes (+7.2% per year) during the study period. This was more marked for males (persons +5.8% per year; episodes +7.9% per year) than females (persons +3.8% per year; episodes +5.6% per year). The gender ratio for episodes steadily

**Table 1** Numbers of persons and episodes referred to the general hospital following deliberate self-harm, by gender, 1985–1995

Year	Males		Females		Both genders	
	Persons	Episodes	Persons	Episodes	Persons	Episodes
1985	278	326	400	463	678	789
1986	290	339	451	494	741	833
1987	292	332	466	514	758	846
1988	279	329	425	490	704	819
1989	298	350	465	548	763	898
1990	331	409	479	553	810	962
1991	323	368	445	504	768	872
1992	303	359	498	586	801	945
1993	344	450	497	590	841	1040
1994	419	540	565	727	984	1267
1995	452	611	568	749	1020	1360
1985–1995 <sup>1</sup>	3042	4413	4395	6218	7437	10 631

1. 'True' persons.

declined, from 1.43 (F:M) in 1985 to 1.35 in 1990 and 1.23 in 1995.

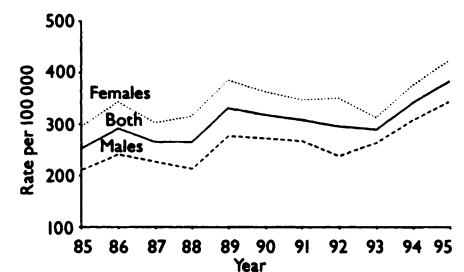
### Rate of DSH

Person-based rates for Oxford City reflected these changes (Fig. 1). The overall rate rose between 1985 and 1995 by 50.9% ( $\chi^2$  for trend=26.18, 1 d.f.,  $P<0.0001$ ), the rates in males by 62.1% ( $\chi^2$  for trend=19.59, 1 d.f.,  $P<0.0001$ ) and the rate in females by 42.2% ( $\chi^2$  for trend=8.42, 1 d.f.,  $P<0.01$ ). The gender ratio for rates decreased from 1.40 (F:M) in 1985 to 1.33 in 1990 and 1.23 in 1995.

When the trends were examined according to gender and age groups it was apparent that the increase in male rates (Fig. 2) was especially marked in 15–24-year-olds. The annual rates per 100 000 in 15–24-year-old males increased from 162.2 in 1985 to 477.1 in 1995, an increase of 194.1% ( $\chi^2$  for trend based on raw data=27.72, 1 d.f.,  $P<0.0001$ ). Rates also increased in females aged 25–34 years, with a 35.6% increase during the study period ( $\chi^2$  for trend=3.98, 1 d.f.,  $P<0.05$ ), and 35–54 years, with a 67.7% increase during the study period ( $\chi^2$  for trend=4.56, 1 d.f.,  $P<0.05$ ). Rates in other age groups did not change significantly.

### Associations with rates of suicide

In males aged 15–24 years, annual rates of DSH in Oxford correlated positively with the combined annual rates of suicide (ICD codes E950–E959) and undetermined cause



**Fig. 1** Rates of deliberate self-harm in Oxford City in persons aged 15 years and over, by gender, 1985–1995

of death (E980–E989) in England and Wales between 1985 and 1995 (Spearman's rho=0.60,  $P=0.053$ ). When the association was examined in 15–24-year-old females, it was also close to statistical significance (rho=0.58,  $P=0.06$ ). The correlations in other age groups for both males and females were much smaller, although all were positive apart from those for females aged 35–54 years and 55 years and over.

### Repetition of DSH

Repetition of DSH also increased, as reflected in an increase in the episodes: persons ratio from an annual average of 1.15 in 1985–1990 to 1.24 in 1991–1995. The repetition rate within a year of an episode in each calendar year also increased, averaging 13.1% in 1985–1989 and 16.1% in 1990–1994 ( $\chi^2=13.81$ ,  $P<0.001$ ). While the repetition rate within a year of a first episode in each year was generally higher in males (mean=15.8%) than females (mean=

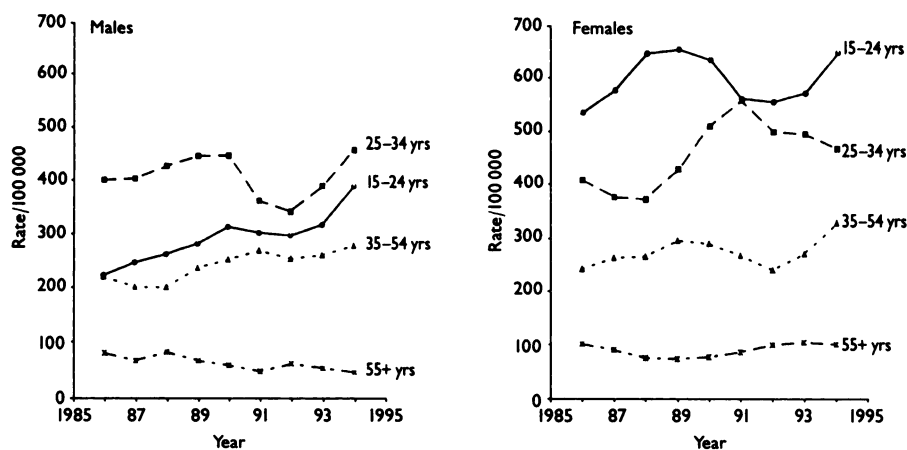


Fig. 2 Age group specific rates of deliberate self-harm in Oxford City, 1985–1995 (rates are shown as three-year moving averages).

14.0%), the increase in annual repetition rates was more marked in females (11.9% in 1985–1989 to 15.8% in 1990–1994;  $\chi^2=15.05$ ,  $P<0.01$ ) than males (15.0% to 16.5%, NS).

There was some indication of a diminution in the percentage of individuals (who received a psychiatric assessment) carrying out their first episodes of DSH (hospital referred or otherwise) during the study period. This proportion declined from 58.7% in 1985–1990 to 51.3% in 1991–1995. However, the mean annual numbers of ‘first-timers’ were very similar in the two time periods, being 353 in 1985–1990 and 350 in 1991–1995.

### Methods used

During the period of the study, 87.9% ( $n=9345$ ) of episodes of DSH involved self-poisoning, 8.3% ( $n=887$ ) involved self-injury, and 3.8% ( $n=399$ ) both self-poisoning and self-injury. There were major changes in the substances used for self-poisoning (Fig. 3). There was a steady increase in the use of non-opiate analgesics ( $\chi^2$  for trend=38.14,  $P<0.0001$ ), this increase being entirely accounted for by the massive increase in the use of paracetamol (including paracetamol-containing compounds). Thus whereas in 1985 31.3% of overdoses involved paracetamol, by 1995 this figure had risen to 49.6% ( $\chi^2$  for trend=98.14,  $P<0.0001$ ). This increase was most marked in females, in whom paracetamol overdoses increased from 29.6% in 1985 to 52.6% in 1995. The comparable increase in males was from 34.1 to 45.9%.

There was also an increase in antidepressant overdoses, from 11.6% in 1985 to 18.2% in 1995 ( $\chi^2$  for trend=55.46,  $P<0.0001$ ). This increase was somewhat more marked in males (from 8.0% in 1985 to 18.1% in 1995) than in females (from 13.9% in 1985 to 18.3% in 1995). Of those who took antidepressant overdoses in 1995, 58.9% used tricyclics and 29.5% used selective serotonin reuptake inhibitors (SSRIs). The previously noted decline in overdoses of minor tranquillisers and sedatives continued between 1985 and 1995, with a drop from 25.5 to 15.6% ( $\chi^2$  for trend=49.19,  $P<0.0001$ ).

### Problems preceding self-harm

The most frequent problems identified as being present at the time of self-harm in the patients who presented in 1995 and were assessed by a member of the hospital psychiatric service showed some marked sex differences (Table 2). Problems concerning a partner, employment or studies, alcohol, drugs and finances were all more common in the males and problems with family members other than a partner were more common in the females.

In terms of living circumstances, an annual mean of 3.2% of individuals (6.4% of males and 1.0% of females) were of no fixed abode. This figure increased between 1985–1990 and 1991–1995, from 2.4 to 3.9% ( $\chi^2=16.61$ ,  $P<0.001$ ).

### Admissions to the general hospital, psychiatric assessment and in-patient psychiatric admission

In spite of the considerable increase in the numbers of patients presenting to the general

hospital following DSH the proportion admitted to an in-patient bed varied little during the study period, averaging 86.5% per year. However, the proportion who received a psychiatric assessment declined, averaging 82.4% in 1985–1990 and 77.4% in 1991–1995 ( $\chi^2=41.65$ ,  $P<0.0001$ ). This decline was particularly marked in the last three years of the study period when the numbers of referrals to the hospital increased substantially (Table 1), with only 73.2% receiving a psychiatric assessment in 1993–1995. In part this reflected the fact that male patients took their own discharge from hospital more than females (10.6% v. 7.5%;  $\chi^2=20.14$ , 1 d.f.,  $P<0.001$ ).

An average of 10.2% of all patients each year were admitted to in-patient psychiatric care from the general hospital, approximately half of whom were already in current psychiatric care and a third were current in-patients. This proportion increased from a mean of 7.9% in 1985–1987 to 12.5% in 1993–1995 ( $\chi^2=30.78$ ,  $P<0.001$ ). This change was more marked in females (from 7.7 to 13.5%;  $\chi^2=27.82$ ,  $P<0.001$ ) than males (from 8.2 to 11.2%;  $\chi^2=5.33$ ,  $P<0.05$ ).

## DISCUSSION

### Increased rates of DSH and implications for suicide prevention

The rising trends in DSH identified in Oxford appear to reflect what is happening

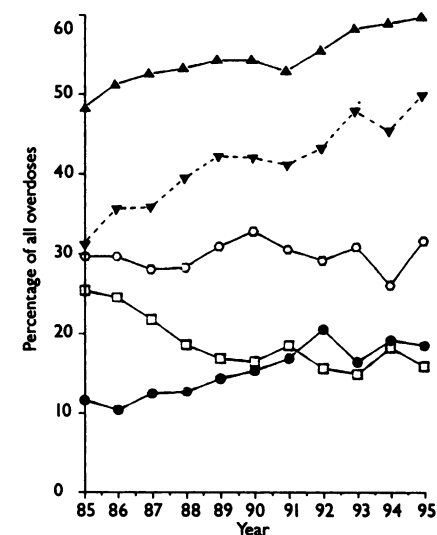


Fig. 3 Trends in substances used for self-poisoning, 1985–1995. ▲—▲, non-opiate analgesics; ▼—▼, paracetamol; ○—○, other; ●—●, antidepressants; □—□, tranquillisers and sedatives

**Table 2** The 10 most frequent types of problems identified at assessment in patients presenting in 1995

Problem	Both genders (n=738)%	Males (n=316)%	Females (n=422)%	<i>p</i>
Partner	55.8	60.1	52.5	<0.05
Other family member	41.2	31.0	48.8	<0.0001
Employment/studies	35.8	46.8	27.5	<0.0001
Alcohol	21.3	30.7	14.2	<0.0001
Financial	20.1	26.6	15.2	<0.001
Social isolation	17.1	16.8	17.3	NS
Housing	16.1	18.7	14.2	NS
Friends	13.4	12.0	14.5	NS
Physical health	12.6	11.4	13.5	NS
Drugs	8.1	13.0	4.5	<0.0001

elsewhere in the UK. Thus our results are in keeping with recent findings based on admissions to general hospitals in Scotland (McLoone & Crombie, 1996) and to a district poisons treatment unit in Wales (Bialas *et al*, 1996). We previously estimated on the basis of Oxford rates that the mean annual number of people presenting to hospitals following DSH in 1989 and 1990 in England and Wales would have been 120 000 (Hawton & Fagg, 1992a). On the basis of the 1995 rate the figure would be 142 000, a substantially increased proportion of whom are males. The rise in the numbers of DSH patients is putting considerable pressure on hospital services, and especially on in-patient beds, and must be an important factor in the worsening bed crisis affecting many general hospitals in the UK. Although there was no reduction in the proportion of DSH patients admitted to a bed in the general hospital in Oxford during the study period, this is probably not true elsewhere. There has certainly been a trend towards more rapid discharge from the general hospital, and a consequent decrease in the proportion who receive a psychosocial assessment.

The increase in DSH has been most marked in young males. This trend has clearly paralleled the recent trend in deaths from suicide and probable suicide. In view of the association between DSH and subsequent suicide in all age groups (Hawton & Fagg, 1988), but especially in young males, the current trend raises serious concerns about whether the recently reported decrease in suicide rates in England and Wales toward The Health of the Nation targets (Department of Health, 1995) will be sustained.

One factor contributing to the recent rise in DSH appears to have been an increase

in frequency of repetition, particularly in females. The reasons for this are unclear, but in addition to placing greater demands on clinical services it may have important implications in view of the known link between repetition and risk of suicide (Hawton & Fagg, 1988). On the other hand, over the duration of our study there was an encouraging reduction in the proportion of patients engaging in their first episode of DSH, but not, unfortunately, in the overall number of 'first-timers', thus providing no evidence of effective primary prevention of DSH.

#### Implications for clinical services

The great increase in male DSH patients presents considerable problems for service provision. Not only do males, as we have shown, take their own discharge from hospital more often than females, a recent review of outcome of treatment studies following DSH has shown that they are less easy to engage in treatment and that currently available methods of treatment appear to be less efficacious in males (Hawton, 1997). The recent trends will therefore place increasing pressure on clinical services to develop more effective treatments for males, especially those in the younger age groups. It may well be that current therapy strategies need to be reviewed for this growing population of DSH patients, perhaps utilising a more practical approach (e.g. an open-house workshop format) combined with aggressive outreach in order to try to keep patients in the programme (Van Heeringen *et al*, 1995). Given the clear evidence that continuity of care is important in sustaining compliance of many DSH patients with treatment

(Möller, 1989) and the risk that transfer of care from general hospital services to community mental health teams can interfere with this, attention needs to be paid to how continuity can be maintained for those patients not already in treatment at the time they self-harm.

#### Changes in substances used in overdoses

The increasing rise in the use of paracetamol for self-poisoning and the concomitant rise in paracetamol-related deaths (Gunnell *et al*, 1997) clearly necessitates urgent preventive strategies, with reduction in paracetamol pack size seeming the best approach (Hawton *et al*, 1996). The rise in antidepressant overdoses in recent years presumably reflects more widespread prescribing, including greater use of SSRIs and other less toxic preparations in patients thought to be at risk of overdose.

#### Problems preceding DSH

The pattern of problems facing DSH patients showed an interesting change from that found in earlier studies in that whereas problems with partners used to be far more common in female DSH patients (e.g. Bancroft *et al*, 1977), the reverse was true in our study. This finding, which probably reflects the large increase in the number of younger male DSH patients, may have implications for the content of therapeutic interventions. The considerable excess of substance misuse in males, with its well-recognised association with greater risk of subsequent suicide, especially in young males (Hawton *et al*, 1993), necessitates that there must be close collaboration between general hospital DSH services and services for alcohol and drug misusers.

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#### REFERENCES

- Bancroft, J., Skrimshire, A., Reynolds, F., *et al* (1975) Self-poisoning and self-injury in the Oxford area: epidemiological aspects 1969–1973. *British Journal of Preventive and Social Medicine*, **29**, 170–177.

—, —, **Casson, J., et al (1977)** People who deliberately poison or injure themselves: their problems and their contacts with helping agencies. *Psychological Medicine*, **7**, 289–303.

**Bialas, M. C., Reid, P. G., Beck, J. H., et al (1996)** Changing patterns of self-poisoning in a UK health district. *Quarterly Journal of Medicine*, **89**, 893–901.

**Charlton, J., Kelly, S., Dunnell, K., et al (1992)** Trends in suicide deaths in England and Wales. *Population Trends*, **69**, 10–16.

**Department of Health (1995)** *Fit for the Future. Second Progress Report on the Health of the Nation*. London: Department of Health.

**Gunnell, D., Hawton, K., Murray, V., et al (1997)** Use of paracetamol for suicide and non-fatal poisoning in the UK and France: Are restrictions on availability justified? *Journal of Epidemiology and Community Health*, **51**, 175–179.

**Hawton, K. (1997)** Attempted suicide. In *Science and Practice of Cognitive Behaviour Therapy* (eds D. M. Clark & C. G. Fairburn), pp. 285–312. Oxford: Oxford University Press.

— & **Goldacre, M. (1982)** Hospital admissions for adverse effects of medicinal agents (mainly self-poisoning) among adolescents in the Oxford Region. *British Journal of Psychiatry*, **141**, 166–170.

— & **Fagg, J. (1988)** Suicide, and other causes of death, following attempted suicide. *British Journal of Psychiatry*, **152**, 359–366.

— & — (1992a) Trends in deliberate self-poisoning and self-injury in Oxford, 1976–90. *British Medical Journal*, **304**, 1409–1411.

— & — (1992b) Deliberate self-poisoning and self-injury in adolescents: a study of characteristics and trends in Oxford, 1976–89. *British Journal of Psychiatry*, **161**, 816–823.

—, —, **Platt, S., et al (1993)** Factors associated with suicide after parasuicide in young people. *British Medical Journal*, **130**, 1641–1644.

—, **Ware, C., Mistry, H., et al (1996)** Paracetamol self-poisoning: characteristics, prevention and harm reduction. *British Journal of Psychiatry*, **168**, 43–48.

**Holding, T., Buglass, D., Duffy, J. C., et al (1977)** Parasuicide in Edinburgh – a seven year review 1968–74. *British Journal of Psychiatry*, **130**, 534–543.

**Kreitman, N. & Schreiber, M. (1979)** Parasuicide in young Edinburgh women, 1968–75. *Psychological Medicine*, **141**, 37–44.

**McLoone, P. & Crombie, I. K. (1996)** Hospitalisation for deliberate self-poisoning in Scotland from 1981 to 1993: trends in rates and types of drugs used. *British Journal of Psychiatry*, **169**, 81–86.

## CLINICAL IMPLICATIONS

- Rising rates of DSH are placing increasing demands on general hospital medical and psychiatric services.
- Reduction in the dangers of paracetamol overdoses is becoming increasingly necessary.
- Increased rates of DSH in young males have implications for treatment provision and prevention of suicide.

## LIMITATIONS

- The data are limited to that which can reasonably be collected in routine monitoring.
- The findings regarding repetition take no account of treatment effects.
- No data are available on completed suicide in the study population.

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**Möller, H. J. (1989)** Efficacy of different strategies of aftercare for patients who have attempted suicide. *Journal of the Royal Society of Medicine*, **82**, 643–647.

**Platt, S., Hawton, K., Kreitman, N., et al (1988)** Recent clinical and epidemiological trends in parasuicide in Edinburgh and Oxford: a tale of two cities. *Psychological Medicine*, **18**, 405–418.

**Schmidtke, A., Bille-Brahe, U., Deleo, D., et al (1996)** 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*, **93**, 327–338.

**Sellar, C., Hawton, K. & Goldacre, M. J. (1990a)** Self-poisoning in adolescents: hospital admissions and deaths in the

Oxford Region 1980–1985. *British Journal of Psychiatry*, **56**, 866–870.

—, **Goldacre, M. J. & Hawton, K. (1990b)** Reliability of routine hospital data on poisoning as measures of deliberate self-poisoning in adolescents. *Journal of Epidemiology and Community Health*, **44**, 313–315.

**SPSS (1993)** *SPSSX for Unix: Base System User's Guide, Release 5.0*. Chicago, IL: SPSS Inc.

**Van Heeringen, C., Jannes, S., Buylaert, W., et al (1995)** The management of non-compliance with referral to out-patient after-care among attempted suicide patients: a controlled intervention study. *Psychological Medicine*, **25**, 963–970.