

## Attendance at the accident and emergency department in the year before suicide: retrospective study

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**Background** The National Confidential Inquiry into suicides in England and Wales found that a quarter of suicides are preceded by mental health service contact in the year before death. However, visits to accident and emergency departments due to self-harm may not lead to a record of mental health service contact.

**Aims** To determine the proportion of suicides preceded by accident and emergency attendance in the previous year.

**Method** We obtained the list of probable suicides in Leeds for a 38-month period, and examined the records from the city's accident and emergency departments for a year before each death.

**Results** Eighty-five (39%) of the 219 people who later died by suicide had attended an accident and emergency department in the year before death, 15% because of non-fatal self-harm. Final visits due to self-harm were often shortly before suicide (median 38 days), but the National Confidential Inquiry recorded about a fifth of them as 'not in contact' with local mental health services.

**Conclusions** Although many suicides are preceded by recent attendance at accident and emergency departments due to non-fatal self-harm, local mental health service records may show no recent contact. Suicide prevention might be enhanced were accident and emergency departments and mental health services to work together more closely.

**Declaration of interest** None.

A key component of a suicide prevention strategy is the monitoring of suicides to determine trends and to suggest further measures for reducing rates. In England and Wales a National Confidential Inquiry into suicides has been put in place, reporting recently that a quarter of suicides are preceded by mental health service contact during the year before death (Appleby *et al*, 1999a; Department of Health, 2001). We have calculated that at least a quarter of UK suicides are preceded by hospital attendance as a result of self-harm (Owens & House, 1994), an estimate that has been corroborated by research findings (Foster *et al*, 1997; Appleby *et al*, 1999b; Hawton *et al*, 1999). It seems to us unlikely that all those people who were in contact with mental health services before suicide were seen because they had undertaken an act of non-fatal self-harm. We suspect, therefore, that the Inquiry methods overlook important contacts with health services that point towards high suicidal risk. For a sample of suicides, we set out to determine the number and nature of attendances at the accident and emergency department in the preceding year, and we established whether non-fatal self-harm was being

detected by local mental health services and reported to the National Confidential Inquiry.

### METHOD

Every health district in England and Wales regularly sends a list of likely suicides to the National Confidential Inquiry into Suicides and Homicides by People with Mental Illness (Department of Health, 2001). The list comprises all suicide verdicts and open verdicts, except where it is clear that suicide was not considered at inquest. Unless specified, findings presented here will refer to the composite group as 'suicides' – in line with the practice in the National Confidential Inquiry (Department of Health, 2001). All local mental health services are required to determine whether or not each person on the list was in contact with their service in the year before death.

We obtained the list of suicides for the Leeds Health District for a 5-year period from 1994. It was our intention to identify, for each suicide on the list, whether the person had attended a local accident and emergency department in the 12 months preceding suicide. Unfortunately, because of the storage arrangements for old accident and emergency records and consequent difficulties with access to them, we were not able to examine all the records for the relevant 6 years (5 years of suicides plus the year before the first suicide on our list). We were, however, able to obtain accident and emergency records for 50 consecutive months and we therefore used as our study sample the suicides that took place over 38 consecutive months between 1994 and 1997;

**Table 1** Relationship between suicide method, verdict and gender

Method	Cases n (%)	Proportion female	Verdict	
			Suicide (n)	Open (n)
Ingested poisoning <sup>1</sup>	72 (33)	0.38	26	46
Hanging	63 (29)	0.03	58	5
Toxic fumes	18 (8)	0	17	1
Narcotic poisoning	12 (5.5)	0.17	2	10
Multiple injuries	12 (5.5)	0.25	6	6
Other methods	18 (8)	0.28	6	12
Unascertained	24 (11)	0.25	7	17
All methods	219 (100)	0.21	122	97

1. Ingested poisons exclude narcotics, which constitute a separate category.

**Table 2** Contact with mental health services in the year before death and its relation to method of suicide and verdict

	Total sample <i>n</i>	Contact with mental health services in year before death	
		No contact ( <i>n</i> )	Contact <i>n</i> (%)
All cases <sup>1</sup>	218	127	91 (42)
Verdict			
Open	96	46	50 (52)
Suicide	122	81	41 (34) <sup>2</sup>
Method of suicide			
Ingested poisoning <sup>3</sup>	72	35	37 (51)
Hanging	63	41	22 (35)
Toxic fumes	18	16	2 (11)
Narcotic poisoning	12	3	9 (75)
Multiple injuries	12	1	11 (92)
Other methods	18	19	3 (17)
Unascertained	23	16	7 (30)

1. In one case, data on contact with mental health services were missing.

2. Difference in proportions 18% (95% CI 5–31).

3. Ingested poisons exclude narcotics, which constitute a separate category.

accident and emergency records were examined for 38 months plus the 12 months prior to the first suicide in the sample.

Leeds has two large accident and emergency departments, each serving a

population of around 350 000. We thereby identified, for each suicide in the 38-month period, all accident and emergency attendances in Leeds hospitals over the preceding 12 months. Where we found an

accident and emergency record that was part of the final, fatal attendance at hospital, we excluded it; all the episodes here therefore represent non-fatal hospital attendances. Our study had local research ethics committee approval.

We used two standard statistical procedures in our analyses: for categorical variables we calculated the 95% confidence intervals for the difference between proportions; and for the one comparison we made for a continuous variable, we used the Mann–Whitney *U* test, because the data were not normally distributed.

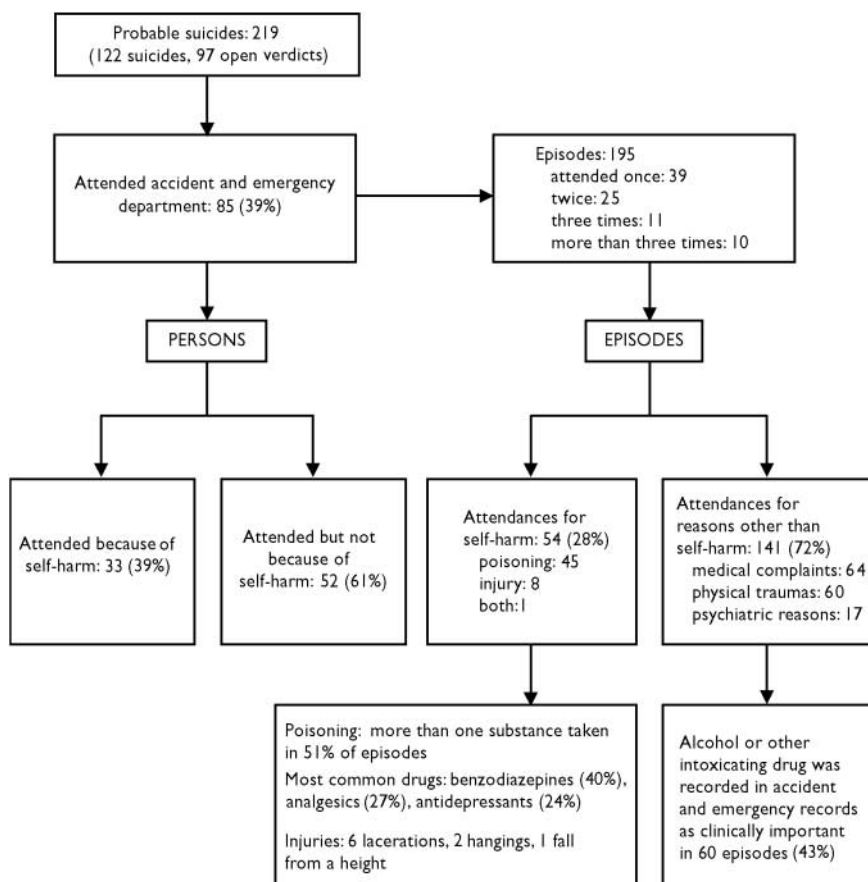
## RESULTS

There were 219 suicides (122 suicides and 97 open verdicts). The people who died had an age range of 16–93 years, median 35 years, and the ratio of males to females was 3.8. Men were more likely to receive a suicide verdict rather than an open verdict (105 of 174 men, 60%) compared with women (17 of 45 women, 38%) – a risk ratio of 1.6 (95% CI 1.2–2.1). The gender difference in verdict may have much to do with method: women were overrepresented in cases of drug poisonings but accounted for few hangings and no carbon monoxide poisoning (Table 1).

The search of records by the local mental health service for the National Confidential Inquiry determined that 91 of the 219 persons who died by suicide (42%) were in contact with its service during the year before their death. Surprisingly, more of those receiving an open verdict than of those receiving a suicide verdict had made contact with local mental health services in the preceding year (Table 2). People whose death was due to multiple injuries or to poisoning by ingestion were particularly likely to have made contact with the mental health services in the last year, while few of those who died by toxic fumes or by unusual methods had been in contact (Table 2).

### Attendance at accident and emergency departments

Of the whole sample, 85 (39%) had attended an accident and emergency department in the year before death, 33 (39%) of them because of non-fatal self-harm – 39% (33/85) of all those who came to accident and emergency, 15% (33/219) of suicides. The 85 people made 195 visits to



**Fig. 1** Accident and emergency department attendance in the year before suicide.

accident and emergency departments. Figure 1 sets out the reasons for attendance and the clinical details. Table 3 shows that there was no striking difference in attendance patterns between the genders or according to the coroner's verdict. Significantly more of those who had been in contact with mental health services in their last year had attended accident and emergency; this difference was almost entirely due to self-harm attendances. People who died from toxic fumes or whose cause of death was unascertained had generally not attended an accident and emergency department because of self-harm in the previous year. On the other hand, of those whose suicide was a result of ingested poisons, nearly half had previously attended during the year – about a fifth because of self-harm.

### Last attendance before death

Of the 85 people who visited accident and emergency departments in the year before suicide, 26 (31%) did so on the last occasion as a consequence of non-fatal self-harm – 20 self-poisoning episodes and 6 self-injuries. These 26 patients were of the same age pattern as the total group of people who had died by suicide. Equal proportions attended the city's two accident and emergency departments. Clinical details and management of the cases by accident and emergency staff are shown in Fig. 2. The final attendance was shortly before suicide (median 38 days, interquartile range 7–129) when the reason was self-harm, but not when it was for other reasons – median 114 days (44–228) (Mann–Whitney  $U=472$ ,  $P=0.005$ ). In their last month of

life 12 people (5% of all suicides in our sample) paid a final visit to an accident and emergency department as a result of non-fatal self-harm.

The local mental health services searched their case records for contacts with their service in the year before suicide. Of the 26 persons whose last attendance at a local accident and emergency department before death was a consequence of non-fatal self-harm, 5 were not found by this search to have been in contact with mental health services in the year before their suicide; consequently, they were notified to the National Confidential Inquiry as 'not in contact'. Either these episodes of self-harm did not result in contact with a mental health practitioner, or contact was made but did not find its way into mental health service records.

**Table 3** Accident and emergency attendance for any reason and specifically for self-harm, and its relation to other variables

	Total sample <i>n</i>	Accident and emergency department attendance		
		Did not attend <i>n</i>	Attended for any reason <i>n</i> (%)	Attended because of self-harm <i>n</i> (%)
All cases	219	134	85 (39)	33 (15)
Gender				
Female	45	25	20 (44)	6 (13)
Male	174	109	65 (37) <sup>1</sup>	27 (16) <sup>2</sup>
Verdict				
Open	97	55	42 (43)	18 (19)
Suicide	122	79	43 (35) <sup>3</sup>	15 (12) <sup>4</sup>
Contact with mental health services in the year before death <sup>5</sup>				
Recorded	91	42	49 (54)	28 (31)
Not recorded	127	91	36 (28) <sup>6</sup>	5 (4) <sup>7</sup>
Method of suicide				
Ingested poisoning <sup>8</sup>	72	39	33 (46)	15 (21)
Hanging	63	45	18 (29)	8 (13)
Toxic fumes	18	15	3 (17)	1 (6)
Narcotic poisoning	12	4	8 (67)	4 (33)
Multiple injuries	12	6	6 (50)	2 (17)
Other methods	18	9	9 (50)	2 (11)
Unascertained	24	16	8 (33)	1 (4)

1. Difference in proportions 7% (95% CI –8 to 23).

2. Difference in proportions 2% (95% CI –12 to 12).

3. Difference in proportions 8% (95% CI –5 to 21).

4. Difference in proportions 6% (95% CI –3 to 16).

5. In one case, data on contact with mental health services were missing.

6. Difference in proportions 26% (95% CI 12 to 38).

7. Difference in proportions 27% (95% CI 17 to 37).

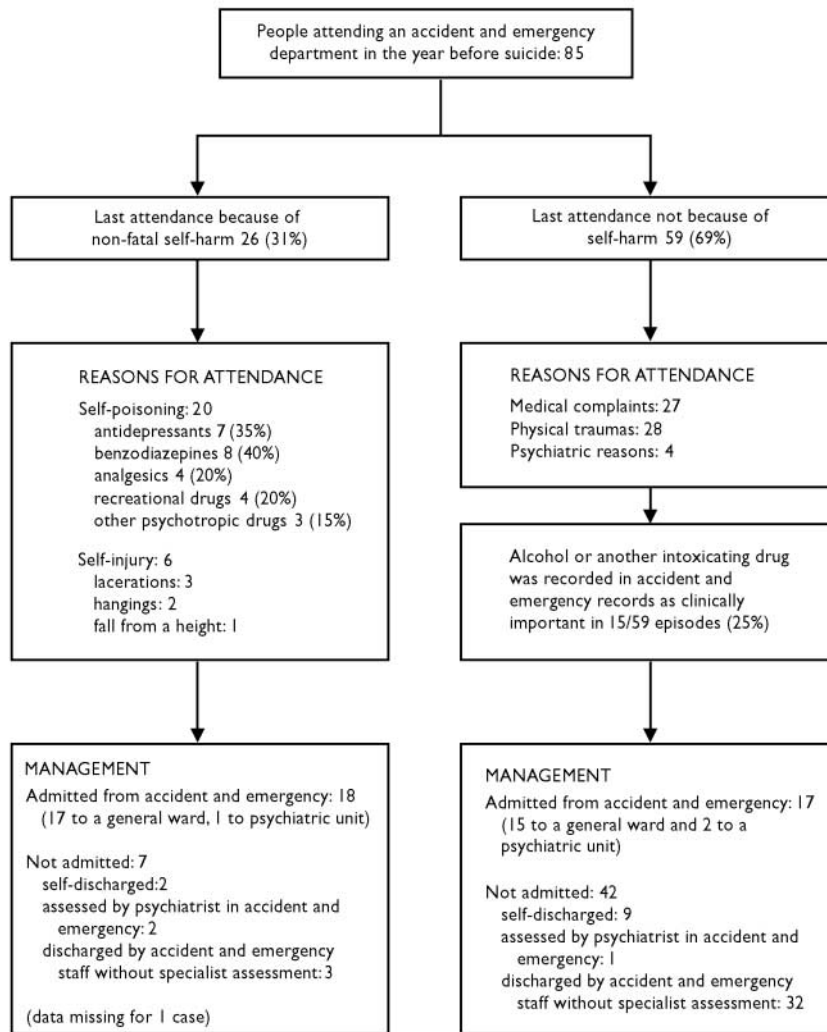
8. Ingested poisons exclude narcotics, which constitute a separate category.

## DISCUSSION

Our main finding was the identification of a high proportion of suicides preceded by accident and emergency attendance (39%) in the year before death, with over one-third of these people (15% of all suicides) attending an accident and emergency department because of a self-harm episode. A substantial proportion of these episodes were not known to local mental health services. Since it is not the National Confidential Inquiry's practice for accident and emergency records to be searched as part of the identification of recent contact with the mental health services, the Inquiry recorded as 'not in contact' 5 out of 26 people whose last visit to the accident and emergency department in the year before their suicide was a consequence of self-harm.

### Accuracy of the study findings

This study used two sources of data: the list of those dying by suicide, including their contacts with local mental health services, sent to the National Confidential Inquiry; and data on attendances drawn from clinical records at the two local accident and emergency departments. The suicide data will not perfectly represent all suicides and mental health service contacts in the period of our sample, but they are the identical data that were received by the National Confidential Inquiry and are included in the Inquiry's findings. Data drawn from accident and emergency records, on the other hand, will contain



**Fig. 2** Last attendance at an accident and emergency department in the year before suicide. All data have been extracted from accident and emergency records.

inaccuracies and may therefore misrepresent the relation between accident and emergency attendance and suicide. We might have missed some attendances – perhaps because of use of different patient names, or simply as a consequence of searching for a small number of episodes among more than half a million attendances at these large accident and emergency departments.

We might also have failed to identify correctly whether each accident and emergency attendance was due to self-harm. Accident and emergency records are often brief and sometimes contain incomplete clinical details. Where it seemed possible that self-harm had occurred but was not recorded by the clinician or coded by the clerical staff as such, we designated the episode as ‘not self-harm’. These methodological shortcomings, inevitable though

they are, seem most likely to have resulted in underestimation of the number and proportion of suicides in Leeds that were preceded by hospital attendance due to non-fatal self-harm.

For two further reasons, we also suspect that our local data underestimate the national shortfall in notification. First, we found that our local mental health services had identified a higher proportion of contacts than was the national average (42% compared with 24% nationally); perhaps the local mental health service was especially adept at tracing contacts. Second, Leeds practice might have shown an above-average rate of psychosocial assessment of self-harm cases during this period (Kapur *et al*, 1998), which would render the mental health service records particularly likely to show a contact around the time of a self-harm episode.

### What are the shortcomings of present arrangements for care after self-harm?

Our retrospective study demonstrates a strong link between non-fatal self-harm and suicide. Published cohort studies have also shown a huge excess of suicidal risk in the year following self-harm: it seems likely that between 0.5% and 2% of those treated for self-harm will die by suicide in the following year (Hawton & Fagg, 1988; Owens *et al*, 2002). It was estimated in 1997, from Oxford rates, that there are over 140 000 people attending hospital because of a self-harm episode each year in England (Hawton *et al*, 1997). Simple arithmetic therefore indicates that a substantial proportion of the 5000 suicides each year in England – probably somewhere between 700 and 2800 of them – are preceded by a self-harm episode in the preceding year.

This close tie between non-fatal and fatal episodes points to the need for great care over the psychosocial assessment and after-care arrangements for people attending hospital because of self-harm. Unfortunately, this connection has been largely disregarded by national policies. Governmental targets for suicide reduction in England started a decade ago with the *Health of the Nation* programme (Department of Health, 1992). They were renewed (Secretary of State for Health, 1999) and accompanied by standard setting (standard 7 in the National Service Framework for Mental Health) for local health and social care communities (Department of Health, 1999). The measures recommended for prevention of suicide have emphasised recognition and treatment of depression, better care of those with severe and enduring mental illness – whether as in-patients, soon after discharge or in community follow-up – and attention to in-patient facilities (Department of Health, 1993, 1999). Self-harm has hardly been mentioned.

The findings of the National Confidential Inquiry, in much the same way as the earlier policy documents, have been used to recommend suicide prevention measures in mental health services – but say little or nothing about more than 150 000 patients across the UK who attend hospital after self-harm each year (Appleby *et al*, 1999a; Department of Health, 2001). The omission is not surprising: our study shows

how the Inquiry's methods are not designed to identify self-harm as an antecedent to suicide.

Across the UK, present arrangements for the psychosocial assessment and after-care of patients attending hospital as a result of self-harm are in disarray (Owens & House, 1994). There is great geographical variation in the proportions of people who receive adequate psychosocial assessment: a large majority of patients are assessed in some hospitals but only a minority in others (Kapur *et al*, 1998). Assessment usually falls well short of the levels of assessment and care recommended by professional bodies (Royal College of Psychiatrists, 1994; Hawton & James, 1995; Hughes *et al*, 1998; Head *et al*, 1999). Effective intervention after self-harm is difficult to establish because the evidence, largely derived from a few small studies, is too weak and inconclusive to provide pointers to best practice (Hawton *et al*, 1998; NHS Centre for Reviews and Dissemination, 1998).

### What practical steps are suggested by this study?

Once risk factors for an adverse outcome have been identified, it is common practice for policy-makers to propose alterations in practice – to be instituted with immediate effect. The findings of the National Confidential Inquiry into suicides have been criticised for this approach (Geddes, 1999) because of the poor predictive validity of the risk factors. How useful is identification of a self-harm episode likely to be? Even though people who self-harm may be at a hundred times the baseline risk (Hawton & Fagg, 1988; Owens *et al*, 2002), suicide in the year following non-fatal self-harm is uncommon in absolute terms: most people attending accident and emergency departments because of self-harm are unlikely to die by suicide in the year that follows. Low specificity of the predictive factor and low prevalence of the outcome bring about a poor positive predictive value: interventions for all will be unnecessary for most and will help only a few.

Taking this epidemiological axiom into account, we recommend only two steps. First, hospitals should, whenever possible, adhere to present governmental policy: that all self-harm patients receive, before

### CLINICAL IMPLICATIONS

- More than a third of over 200 consecutive suicides were preceded by accident and emergency attendance in the previous year.
- Over one-third of those who attended an accident and emergency department in the year before suicide did so because of self-harm, although a substantial proportion of these episodes were unknown to local mental health services.
- The National Confidential Inquiry fails to identify the scale of the connection between non-fatal and fatal self-harm.

### LIMITATIONS

- Accident and emergency records are not detailed enough to determine whether some attendances were due to self-harm.
- In our sample those dying by suicide had higher than national average recorded contact rate with mental health services, so other mental health services may miss even more self-harm episodes.
- We have probably underestimated the shortfall in local mental health services' records of accident and emergency attendance due to self-harm.

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discharge from hospital, a psychosocial assessment from a member of staff specifically trained for this task (Department of Health and Social Security, 1984). This assessment, and the ensuing decisions about after-care, should become part of the patient's clinical record – held by or made available to the mental health service. These contacts and assessments would thereby become available to the process of monitoring and audit of suicides by the National Confidential Inquiry. Second, because it is inevitable that a proportion of patients will receive no such assessment, the National Confidential Inquiry must record the occurrence of hospital attendance after self-harm. Only in this way can we evaluate the relation of non-fatal self-harm to suicide; all the present indications suggest that important links are not being made between general hospital and mental health services, and are being missed by policy-makers.

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