

## Lifetime suicide rates in treated schizophrenia: 1875–1924 and 1994–1998 cohorts compared<sup>†</sup>

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**Background** Recent interest in suicide rates in schizophrenia has been considerable.

**Aims** To establish the lifetime suicide rate from the pre-chlorpromazine era and to compare this with recent lifetime suicide rates for schizophrenia.

**Method** We have compared suicide and suicide attempt rates for 741 admissions for schizophrenia and 1303 admissions for psychoses to the North Wales Asylum between 1875 and 1924, with first admissions for psychosis in North West Wales between 1994 and 1998.

**Results** The suicide rate in schizophrenia between 1875 and 1924 was 20 per 100 000 hospital years, a lifetime rate of less than 0.5%. The suicide rate for all psychoses was 16 per 100 000 hospital years. Current rates of suicide for schizophrenia and other psychoses appear 20-fold higher.

**Conclusions** These findings point to an increase in suicide rates for patients with schizophrenia.

**Declaration of interest** D.H. has links with all major pharmaceutical companies and has been an expert witness in legal cases involving psychotropic drugs. A.P.R. and R.T. have been consultants for or received educational support from most major pharmaceutical companies.

In patients with schizophrenia, lifetime suicide rates of 10% are widely cited from both pre- and post-community care eras (Meltzer *et al*, 2003). However, studies from the pre-community care era have yielded estimates of a lifetime suicide risk ranging from 0.03% to 18% (Miles, 1977), with data for the largest samples indicating a 1–2% lifetime risk. This raises the possibility that the modern treatment of schizophrenia is linked to an increased rate of suicide. Possible increases in suicide risk mediated via deinstitutionalisation, restored insight, inadequate treatment dosages and adverse effects of treatment have been proposed (Caldwell & Gottesman, 1990). In North Wales, a historical database, which is particularly useful for studies of mental health service utilisation, has been established and may help to shed light on this question (Healy *et al*, 2001).

### METHOD

We have used two data-sets, namely the North West Wales historical database, and data on recent first admissions for psychosis in North West Wales.

#### North West Wales historical database

The first data-set consists of admissions from North West Wales to the North Wales Asylum at Denbigh during the 50-year period from 1875 to 1924. This time frame was chosen for three reasons. First, religious and legal sanctions on suicide in the UK had been removed by that time, and although there have been variations, suicide rates in the UK were no lower in the 1870s or in any intervening period than they are now. Second, suicides occurring in all British asylums at that time were subject to compulsory notification, which means that data are available for external reference for the North Wales figures. Third,

all asylum deaths had to be reported to the coroner.

The records from the North West Wales service provide an opportunity to shed some light on comparative rates of suicide and suicide attempts in patients with schizophrenia from the pre- and post-community care eras, as the population of North West Wales has remained essentially unchanged in numbers and ethnic mix for 120 years. Thus in 1891 the population was 232 109, with 116 924 people aged between 15 and 55 years, and in 1996 the population was 240 683, with 119 323 people aged 15–55 years (Southall *et al*, 2004). Second, the region has remained undeveloped, so patterns of service utilisation can be more readily compared over time in this area than elsewhere. Third, major geographical and financial constraints have minimised the clinical and economic selection biases that appear to have affected other pre-community care studies of mental health service utilisation. Fourth, the incidence of schizophrenia in North West Wales has remained constant over 125 years (Harris *et al*, further details available from the author on request).

The procedures underpinning diagnosis have been outlined elsewhere (Healy *et al*, 2001). All diagnoses were made according to ICD-10 criteria (World Health Organization, 1993) and had been made before this study of suicides and suicide attempts was undertaken. The historical records offered five sets of information that were relevant to diagnosis. First, all patients were compulsorily detained, and their records included the medical and legal certificates outlining the circumstances that led to detention. Second, the records contained standard demographic data, including age, gender, level of education, employment status, marital status, family history of mental illness and previous mental or physical illness. Third, there were standard assessments of each patient's dangerousness, suicidality and seizure-proneness, together with information on food refusal and a range of other clinical features. Fourth, there was a description of each patient's mental and physical state on admission. Fifth, there was a set of case notes covering the patient's stay in hospital until discharge or death. We were able to retrieve the records of past admissions as far back as 1865, and of subsequent admissions up to 1965. Clinicians made diagnoses on the basis of a full set of records from all admissions for each

<sup>†</sup>See invited commentary, pp. 229–230, this issue.

patient, rather than simply on the case record for that admission.

Based on this information, diagnoses for schizophrenia (F20), schizoaffective disorders (F25), delusional disorders (F22) and acute and transient psychotic disorders (F23) were relatively clear-cut. The remaining patients were diagnosed as unspecified non-organic psychoses (F29) if the clinical picture was insufficient to distinguish clearly between a mood disorder with psychotic features and a schizophrenic or delusional disorder. As some of the patients diagnosed as F23 and F29 may have had a schizophrenic or schizoaffective disorder, we have supplied data for suicidality for all patients in whom a psychosis was diagnosed.

Data on suicides and suicide attempts could be readily obtained from the notes. It was a requirement of admission to hospital between 1875 and 1914 that patients be categorised in terms of their suicide risk (Anderson, 1987). In North Wales, this led to standard assessments (not suicidal, suicidal, actively threatening suicide or attempted suicide). For 9% of patients in the total sample, no explicit indication of suicidality was provided. As the recording of suicidality was mandatory, we have assumed that these patients were not suicidal on admission. The accompanying case notes for these patients give no indication of in-patient suicidality.

Concern that the stigma associated with suicide might have led to underreporting of suicides in these records seems to be misplaced for a number of reasons. First, both suicides and suicide attempts were recorded explicitly in the notes. Second, it was compulsory for such deaths to be notified, and the suicide figures appeared in the annual asylum report. Third, deaths by suicide led to inquests, and the inquest records are available. Fourth, even suicides that occurred after discharge were recorded. Fifth, post-mortem examinations were commonly performed and the records of physical decline in patients who died in hospital are available, making it possible to determine whether any of these deaths were likely to have been 'hidden' suicides. In the case of suicide attempts, in-patient records note clear attempts and also indicate whether patients were put on a suicide 'card', which led to a range of procedures designed to minimise the risk of suicide. We have included patients who were on suicide cards, but who did not have a history of clearly recorded attempts, as possible suicide

attempts. When patients were admitted to hospital after a suicide attempt, details of the attempt were provided. In addition, the records frequently noted suicides and suicide attempts in relatives as part of the medical history.

### Recent first admissions for psychosis

The second data-set is drawn from an ongoing study (further information available from D.H. on request) of the incidence of service utilisation for both non-affective and affective psychoses in North West Wales. From this we have identified all patients who were first admitted between 1994 and 2003 for conditions now diagnosed as F20 to F29. The incidence of suicide from first admission up to 5 years after admission has been determined for those patients who were admitted between 1994 and 1998. Patients were included in this study if they were either native to North Wales or resident in North Wales after their initial episode. Patients who were not resident in or native to North Wales, who had an initial illness episode in North Wales but left the region thereafter (e.g. college students) were not included.

Initial cross-sectional diagnoses of schizophrenia and other psychoses made by consultant psychiatrists were supplemented by 5-year longitudinal data with further diagnostic input from the consultant and community mental health team. This procedure led to a revision of diagnoses from F20 to F23 or F29 for a small number of initial relatively brief admissions with no subsequent service contact, and to a revision of diagnoses in the opposite direction for initially brief admissions with subsequent progression to treatment (e.g. with clozapine).

Suicides were determined in this cohort of patients by manually checking all of the paper records for each patient, as well as the computerised records, supplemented by coroners' verdicts. All deaths were accounted for in this group of patients.

## RESULTS

During the period 1875–1924, there were 3872 admissions, involving 3170 individuals, to the asylum from North West Wales. In 40 cases, incomplete records mean that diagnosis was impossible. Of the remaining 3832 admissions, there were 1303 admissions involving 1041 individuals

who were diagnosed with a psychotic disorder. Of these, there were 741 admissions involving 594 individuals who were diagnosed with schizophrenia or schizoaffective disorder. A further 185 admissions were diagnosed as delusional disorders, and 377 admissions were diagnosed as acute and transient psychotic disorders or other non-organic psychoses. In addition, there were 659 admissions which were diagnosed as unipolar depression.

Of the total of 3872 admissions, 460 involved patients who were considered to be suicidal, or who had threatened suicide ( $n=234$ ) or attempted suicide ( $n=315$ ). The overall rate of admissions for suicidality was therefore 26%, with an 8.1% rate of suicide attempts on admission. The group of patients who were seriously mentally ill (all admissions except for patients with dementia, organic psychosyndromes or learning disabilities) had a rate of suicidality of 29.5% and a rate of suicide attempts of 9.5% on admission.

For patients with schizophrenia and other psychoses in both the historical and recent cohorts, the mean age at onset, male:female ratios, rates of detention and median lengths of stay are outlined in Table 1, together with the total length of stay in hospital (hospital patient years) and illness duration (patient contact years) for the historical cohort. In the historical cohort, 440 of the 594 patients with schizophrenic disorders (74%) died in hospital, often after earlier discharge.

### Suicide rates during the period 1875–1924

Of the 741 patients with schizophrenia who were admitted, 591 were not designated as suicidal on admission. Of the remaining patients, 70 were considered to be suicidal, 37 were listed as having threatened suicide and 43 had attempted suicide (see Table 2). This represented a suicide attempt rate of 5.8%. Comparable mandatory data are not available for the recent cohort.

In hospital, the historical cohort of patients with schizophrenia included 2 suicides, 4 non-fatal suicide attempts, 2 clear threats of suicide and a further 26 patients who were considered sufficiently suicidal to be put on suicide watch. One male patient completed suicide 8 months after admission to a hospital ward, and one female patient completed suicide 10 years

**Table 1** Demographic characteristics of the cohorts for the periods 1875–1924 and 1994–2003

	Number of patients	Number of admissions	Mean age at first hospitalisation (years)	Male:female ratio	Median length of first admission (%)	Proportion detained on first admission (%)	Total cohort hospital years	Illness duration in total cohort (years)
Schizophrenia (1875–1924)	594	741	30.9	50:50	6.9	100	9960	12 467
All psychoses (1875–1924)	1041	1303	35.4	49:51	2.1	100	12 208	15 522
Schizophrenia (1994–2003)	139	NA	29.9	65:35	0.08	66	NA	NA
All psychoses (1994–2003)	238	NA	34.6	59:41	0.07	61	NA	NA

NA, not available.

after admission while on escorted day leave.

Data for the acute, transient and non-organic psychoses groups are also shown in Table 2. Overall, the 1303 admissions for psychoses gave rise to 68 suicide attempts on admission, 7 suicide attempts in hospital and 47 patients threatening suicide or being put on a suicide card.

For schizophrenia, the occurrence of 2 suicides in 9960 patient contact years or 2 suicides in 12467 patient years yields suicide rates of 20 per 100 000 patient contact years or 16 per 100 000 patient years. This gives a lifetime suicide rate of 0.34% in a sample in which 74% of deaths are accounted for, or 0.46% in the sample in which all deaths were confirmed. There appear to have been only 6 clear suicide attempts in hospital, of which 2 attempts were successful. This gives a rate of 60 per 100 000 patient contact years. Adding all instances of further significant suicidality within hospital to that figure ( $n=28$ ) gives a rate of 341 per 100 000 patient contact years. However, there were clearly at least 43 suicide attempt recorded, when attempts on admission are included, and adding these gives an incidence of 393 per 100 000 patient years for clear-cut suicide

attempts and 618 per 100 000 patient years for possible suicide attempts.

The incidence figures for suicides in all psychoses are 16 per 100 000 patient contact years or 13 per 100 000 patient years, or a 0.2% lifetime rate in a sample in which 80% of deaths were confirmed, or a 0.33% rate in a sample of confirmed deaths. The suicide attempt rate ranges from 74 per 100 000 patient contact years for clear suicide attempts in hospitals to 459 per 100 000 patient contact years for possible suicide attempts. Figures for suicide attempts, including attempts on admission, range from 496 per 100 000 patient years for confirmed suicidal acts to 799 per 100 000 patient years for possible suicidal acts.

There are a number of sources of external validation of these results. Asylum returns indicate that suicides as a proportion of total deaths in British Victorian asylums decreased from 0.63% in 1867 to 0.14% in 1911 (Anderson, 1987). In North Wales there were 4 deaths by suicide out of a total of 1842 deaths in care (i.e. 0.22% of deaths). The proportion of deaths by suicide in the sample of deaths among patients with schizophrenia was 0.45%. The proportion of psychotic deaths that were a result of suicide was 0.33%. The

best recent comparable lifetime figure for deaths by suicide as a proportion of all deaths among patients with schizophrenia is 1.23% (Mortensen & Juel, 1993).

These results are also internally validated by the rates of suicides and suicide attempts in patients with unipolar depression. Of this group of 659 admissions, which led to 1418 hospital exposure years, 228 patients (35%) were considered suicidal on admission, and 140 patients (21%) had made a suicide attempt, representing a 56% rate of serious suicidality. Once admitted, 110 out of 659 patients were considered suicidal and were put on suicide watch, and 18 patients made a suicide attempt in hospital. Of these, two attempts were fatal and a further three suicides were recorded in the week following discharge, with one more suicide taking place within 2 months of discharge. Five of these 6 suicides involved female patients. This yields suicide rates ranging from 140 to 351 per 100 000 patient years, based on 2 or 5 suicides. The incidence of suicide attempts in hospital ranges from 1263 per 100 000 hospital years for definite suicide attempts to 8982 per 100 000 hospital years for possible suicide attempts. These rates of serious suicidality are consistent with historical perceptions that affective disorders

**Table 2** Suicidal ideation and suicide attempts at admission and during hospitalisation in North Wales for the periods 1875–1924 and 1994–1998

	Number of admissions (number of patients)	Suicidal on admission	Suicide attempt on admission	Suicidal in hospital	Suicide attempt in hospital	Suicides in hospital	Suicides in month after discharge	Suicides in 5 years after first admission
All psychoses (1875–1924)	1303 (1041)	184	68	47	7	2	0	1
Schizophrenia (1875–1924)	741 (594)	107	43	28	4	2	0	1
Delusional disorder	185 (153)	25	5	6	0	0	0	0
Other psychoses	377 (296)	52	20	13	1	0	0	0
Unipolar depression	659 (569)	228	140	110	16	2	3	6
All psychoses (1994–1998)	NA (160)					2	2	5
Schizophrenia (1994–1998)	NA (85)					2	2	4

NA, not available.

posed a greater suicide risk than schizophrenia, and are also in line with epidemiological studies from the early psychotropic period of suicide in depression (Hagnell *et al*, 1981). In addition, they indicate that the low incidence figures for suicidal acts in patients with schizophrenia in this study do not stem from a reluctance to record suicidal acts.

### Suicide rates during the period 1994–1998

During the 10-year period from 1994 to 2003 inclusive, 238 patients who were given a diagnosis of F20 to F29 made first contact with the mental health services in North West Wales. Of these 238 patients we followed up the 133 members of the 1994–1998 cohort for a 5-year period, giving 665 patient years, during which there were 5 suicides in this cohort. Of these, 4 suicides involved women and 1 involved a man. Four of the patients who completed suicide had a diagnosis of schizophrenia or schizoaffective disorder, and one had a diagnosis of psychosis unspecified. Two suicides occurred in in-patient or support unit settings, two occurred within 1 month of discharge and one occurred during the 5-year follow-up period. This yields an overall suicide rate of 752 per 100 000 patient years for that 5-year period, with a higher rate of suicide for the 76 patients with schizophrenia.

Given the higher risk of suicide during first episodes of schizophrenia, the appropriate pre-community care comparison group consists of patients who completed suicide during the first 5 years of contact with the asylum service. In the case of patients with schizophrenia, in the 1875–1924 cohort this represents 1 suicide in 594 individuals monitored over 2970 patient years, or a suicide rate of 34 per 100 000 patient years. There can be less confidence about the follow-up of patients with non-schizophrenia psychosis, but 1 confirmed suicide in 1041 individuals monitored over 5205 patient years gives an incidence of 19 per 100 000 patient years. These figures indicate that there is a substantial difference between the pre- and post-community care periods.

## DISCUSSION

This study of suicide rates among treated patients during the period 1875–1924 in

North Wales provides the largest database from the pre-community care era (in terms of patients and deaths) for lifetime suicide rates in patients with non-affective psychoses diagnosed by present-day criteria. It also offers pointers to lifetime suicide attempt rates in patients with psychosis from the pre-community care era. This patient group seems to be less limited by selection biases than other populations for which data have been published, and there appear to be a number of sources of external and internal validation of the results.

### Pre- and post-community care lifetime suicide rates in patients with schizophrenia

The apparent suicide rate of 20 per 100 000 hospital years, or an observed lifetime suicide rate of 0.46%, undermines claims that the lifetime suicide rate among patients with schizophrenia or psychoses in the pre-community care era was of the order of 10%. The North Wales findings support estimates of a lifetime rate of 1–2% or lower reported in the methodologically stronger studies of the pre-community care era, rather than the commonly cited rate of 10%, which stems from patient samples that were subject to considerable economic and clinical selection biases (Bleuler, 1978), or patients with incomplete follow-up (Rennie, 1939), or patient cohorts that were identified when distinctions between manic-depressive and schizophrenic disorders were blurred.

However, these figures cannot be viewed as representative of the natural rate of suicide or suicide attempts in untreated schizophrenia in the pre-community care era, in that hospitalisation aimed to minimise the risk of suicide (Anderson, 1987). The methods that were used to manage suicidality in the Victorian period overlap with the methods that are used today, and included the removal of sharp utensils, belts and shoelaces, the dispersal of groups of suicidal patients, and observation. The greatest differences between 1900 and 2000 were that in the Victorian period patients could more readily be kept on locked wards, were not discharged until the risk of suicide was thought to have completely passed and were not discharged on recently instituted psychotropic medication.

However, although the rates reported here may not represent the natural rate

for suicides in patients with schizophrenia, the differential rates for suicidality in the groups with schizophrenia and depression both before admission and in hospital in the historical sample point to a lower inherent suicidality in patients with schizophrenia compared with patients with depression.

A suicide rate of 10% in patients with schizophrenia is also commonly cited for the post-community care era (Meltzer *et al*, 2003). In contrast, the most comprehensive analysis of the present-day lifetime risk of suicide in schizophrenia indicates that there is a 4% lifetime suicide rate based on a standardised mortality rate of 8.45% (95% CI 7.98–8.95) (Harris & Barraclough, 1997; Inskip *et al*, 1998). Applied to an international population lifetime risk of suicide of 16 per 100 000 person years, this would give a best estimate of 135 per 100 000 patient years for suicide rate (95% CI 128–143 per 100 000). Adjusting for the slightly lower general rate of suicides in the UK (10 per 100 000) compared with the international average would yield a value of 84.5 per 100 000 patient years. Applied to North Wales, these figures would suggest that there has recently been a possible modest increase in suicide rates among patients with schizophrenia.

However, when cohorts are compared over a controlled 5-year follow-up period, the number of suicides in the 1994–1998 cohort in this study appears to be considerably higher. This cannot be explained in terms of the higher proportion of male patients in the recent sample, as in both the historical and recent cohorts suicides in North Wales predominantly involved female patients. Furthermore, these findings point to a risk period for present-day patients that is in line with findings from the National Confidential Inquiry (Department of Health, 2001).

A number of other studies point to an increased lifetime rate of suicide for patients with schizophrenia in recent times. First, a data-set on suicides from 2.5 million patient years of hospitalised US veterans between 1950 and 1975 shows comparable suicide rates in veterans treated for general medical and neuropsychiatric conditions between 1950 and 1955, but thereafter an 8-fold increase in suicide rate among neuropsychiatric patients compared with general medical patients (Farberow *et al*, 1978; reports available from D.H. on request).

Second, there is evidence that the trend towards increased suicide rates has continued beyond the 1970s, with a 1.56-fold (95% CI 1.01–2.41) higher relative risk of suicide in first-episode schizophrenia in Denmark in the 1980s compared with the 1970s (Mortensen & Juel, 1993), although in the 1990s Danish suicide rates in patients with schizophrenia decreased in line with a declining national suicide rate (Nordentoft *et al*, 2004). Furthermore, in the largest study of suicide in first-episode schizophrenia to date, Mortensen & Juel (1993), reported a 50-fold increase in suicide rates for first-episode schizophrenia in the modern era compared with the general population norm. These Danish rates are higher than the rate for pre-community care first-episode schizophrenia in the present study, and are broadly comparable to current figures for first episodes of psychosis from North West Wales.

### **Possible factors contributing to increased lifetime rates of suicide in patients with schizophrenia**

Standard reviews of suicide in patients with schizophrenia cite deinstitutionalisation and antipsychotic use or non-use as the main factors contributing to any increases in suicide risk (Caldwell & Gottesman, 1990). More recently, data on suicides in patients with schizophrenia from the recent British National Confidential Inquiry (Department of Health, 2001) have suggested that in-patient status and the month after discharge are associated with high risk for patients with schizophrenia. It is difficult to tease apart the effects of deinstitutionalisation and drug treatment. However, there are good grounds for attempting to do so, as drug treatment is one of the variables that is most clearly under clinical control, and it is also the one that is most amenable to controlled research.

The randomised trials that were undertaken for the purpose of registering risperidone, olanzapine, quetiapine, sertindole and ziprasidone with the US Food and Drug Administration (FDA) provide data on rates of suicide among over 14 000 patients taking these agents compared with placebo, which can to some extent disentangle the effects of drug treatment from other issues such as deinstitutionalisation. Analysis of these data, using an exact version of the one-sided Mantel–Haenszel

procedure, yields an exact 95% confidence interval for the odds ratio of completing suicide while taking investigative antipsychotic agents (excluding comparator antipsychotics) *v.* placebo (95% CI 1.0825–∞;  $P=0.03955$ ) (Healy, 2004).

The data from these FDA studies do not represent present-day rates of suicide or suicide attempts in patients with schizophrenia. However, an excess of suicides among patients receiving treatment in these studies calls for an explanation. The most obvious point about the patients who took part in these studies is that they were subject to discontinuation of one set of antipsychotics on entry, possibly needlessly on occasion, and commencement on another set, often followed by further discontinuation. Consequently, the patients in these trials had a higher than average frequency of pharmacological life events. Thus, FDA trials may offer an insight into the risks inherent in present-day increasingly brief admissions, which are increasingly becoming points of maximum drug-induced neurophysiological instability. It should be noted that these FDA data do map on to data for suicidal acts from post-marketing surveillance studies of recently introduced antipsychotic drugs in clinical practice in the UK (Mackay *et al*, 1998; Biswas *et al*, 2001).

### **Possible mediating factors in treatment-related hazards**

Taken together, these data-sets support observations extending back to the use of reserpine in the 1950s, which suggested that antipsychotics might cause problems for some patients (Healy & Savage, 1998). The literature from the early period of antipsychotic usage partly attributed an apparently new risk of suicide to deinstitutionalisation, as well as to the use of inadequate doses of antipsychotic drugs and to the return of insight following treatment with antipsychotics (Beisser & Blanchette, 1961; Hussar, 1962; Saugstad & Odegard, 1979). However, there was also concern about pharmacologically induced hazards, such as akathisia and dysphoria, which have been the focus of attention in subsequent years (Hogan & Awad, 1983; Drake & Ehrlich, 1985), and it is now generally accepted that akathisia is linked to suicide (American Psychiatric Association, 2000). Such adverse effects can clearly interact with deinstitutionalisation if they develop in

relatively unsupervised settings (Caldwell & Gottesman, 1990).

A further hazard, which has received little attention, is discontinuation of treatment (Gilbert *et al*, 1995; Tranter & Healy, 1998). A study of FDA medical reviews of the registration trials for antipsychotic agents indicates that suicides and suicidal acts occurred during the run-in/placebo-washout phase of these trials when many patients had had their previous antipsychotic treatment terminated. Suicides also occurred during the 30-day discontinuation period after the studies had ended, but:

Withdrawal phenomena were not formally assessed after patients discontinued risperidone. Several patients committed suicide within one month of discontinuing risperidone; however, it does not seem reasonable to attribute this to withdrawal, given the absence of other indicators of a risperidone withdrawal syndrome and the fact that schizophrenia is known to be a risk factor for suicide.

(Mosholder, 1993)

A consideration of the historical and contemporary data-sets in the present study suggests that discounting suicide data in this way may not be appropriate. The results reported here indicate that in patients with affective disorder, the overall effect of modern methods of treatment, perhaps by benefiting some and not others, has been to leave the suicide rate unchanged. In contrast, the historical suicide rates for patients with schizophrenia who were treated within asylum settings were so low that deinstitutionalisation, other social changes and novel psychotropic drug treatments, or some interaction of these influences, will almost inevitably have led to increased rates of suicide. If this is the case, it is essential that patients are monitored closely for treatment-related risks of suicide, especially if there are drugs available that may minimise those hazards, as has been suggested for clozapine (Meltzer *et al*, 2003). It will also be vital to monitor risk periods in line with the recommendations of the National Confidential Inquiry (Department of Health, 2001).

The only conclusive way to demonstrate either a drug treatment-mediated or an institutional setting-mediated reduction or increase in suicidality in patients with schizophrenia is by means of a placebo-controlled randomised trial in first-episode schizophrenia, which would necessarily need to run for several years. This may be practically impossible, as first episodes are

often not recognised as such, and placebo samples in subsequent episodes are confounded by past exposure to therapeutic agents, as well as the selective influence of a range of other factors on the original population. In the absence of a placebo-controlled, first-episode trial, epidemiological data from treated and untreated populations will continue to have an important role in any consideration of this issue.

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## REFERENCES

- American Psychiatric Association (2000)** *Diagnostic and Statistical Manual of Mental Disorders (4th edn) (DSM-IV)* (text revision). Washington, DC: APA.
- Anderson, O. (1987)** *Suicide in Victorian and Edwardian England*. Oxford: Oxford University Press.
- Beisser, A. & Blanchette, J. A. (1961)** A study of suicide in a mental hospital. *Diseases of the Nervous System*, **22**, 365–369.
- Biswas, P. N., Wilton, L. V., Pearce, G. L., et al (2001)** The pharmacovigilance of olanzapine: results of a post-marketing surveillance study on 8858 patients in England. *Journal of Psychopharmacology*, **15**, 265–271.
- Bleuler, M. (1978)** *The Schizophrenic Disorders: Long-Term Patient and Family Studies* (trans. J. M. Clemens). New Haven, CT: Yale University Press.
- Caldwell, C. B. & Gottesman, I. (1990)** Schizophrenics kill themselves too: a review of risk factors for suicide. *Schizophrenia Bulletin*, **16**, 571–589.
- Department of Health (2001)** *National Confidential Inquiry into Suicide and Homicide by People with Mental Illness. Five-Year Report*. London: Department of Health.
- Drake, R. E. & Ehrlich, J. (1985)** Suicide attempts associated with akathisia. *American Journal of Psychiatry*, **142**, 499–501.
- Farberow, N., Ganzler, S., Cuttler, F., et al (1978)** *Status of Suicides in Veterans Administration Hospitals. Reports 2–4*. Los Angeles, CA: Central Research Unit, V. A. Wadsworth Hospital Center.
- Gilbert, P. L., Harris, J., McAdams, L. A., et al (1995)** Neuroleptic withdrawal in schizophrenic patients. *Archives of General Psychiatry*, **52**, 173–188.
- Hagnell, C., Lanke, J. & Rorsman, B. (1981)** Suicide rates in the Lundby study: mental illness as a risk factor for suicide. *Neuropsychobiology*, **7**, 248–253.
- Harris, E. C., Barraclough, B. (1997)** Suicide as an outcome for mental disorders: a meta-analysis. *British Journal of Psychiatry*, **170**, 205–228.
- Healy, D. (2004)** Shaping the intimate: influences on the experience of everyday nerves. *Social Studies of Science*, **34**, 219–245.
- Healy, D. & Savage, M. (1998)** Reserpine exhumed. *British Journal of Psychiatry*, **172**, 376–378.
- Healy, D., Savage, M., Michael, P., et al (2001)** Psychiatric bed utilisation: 1896 and 1996 compared. *Psychological Medicine*, **31**, 779–790.

## CLINICAL IMPLICATIONS

- The widely cited lifetime rate of 10% for suicide in patients with schizophrenia is incorrect for both the pre- and post-community care eras.
- The best estimate for the lifetime rate of suicide in patients with schizophrenia in the pre-community care era is of the order of 1% or less.
- Although deinstitutionalisation is probably the single most important factor in determining suicide rates in patients with schizophrenia, pharmacotherapy appears to contribute to this risk, and is the element of current care that is under most clinical control.

## LIMITATIONS

- The comparator sample of present-day patients with psychosis was relatively small.
- Current clinical recording methods do not make the recording of suicidal acts mandatory, so data on this important variable were lacking for the present-day cohort.
- Unlike a randomised trial, this epidemiological study could not control for a range of important variables.

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**Hogan, T. P. & Awad, A. G. (1983)** Pharmacotherapy and suicide risk in schizophrenia. *Canadian Journal of Psychiatry*, **20**, 277–281.

**Hussar, A. E. (1962)** Effect of tranquillisers on medical morbidity and mortality in a mental hospital. *JAMA*, **179**, 682–686.

**Inskip, H. M., Harris, E. C. & Barraclough, B. (1998)** Lifetime risk of suicide for affective disorder, alcoholism and schizophrenia. *British Journal of Psychiatry*, **172**, 35–37.

**Mackay, F. J., Wilton, L. V., Pearce, G. L., et al (1998)** The safety of risperidone: a post-marketing study of 7684 patients. *Human Psychopharmacology*, **13**, 413–418.

**Meltzer, H. Y., Alphas, L., Green, A. J., et al (2003)** Clozapine treatment for suicidality in schizophrenia. International suicide prevention trial (InterSePT). *Archives of General Psychiatry*, **60**, 62–91.

**Miles, P. (1977)** Conditions predisposing to suicide: a review. *Journal of Nervous and Mental Disease*, **164**, 231–246.

**Mortensen, P. B. & Juel, K. (1993)** Mortality and causes of death in schizophrenic patients in Denmark. *Acta Psychiatrica Scandinavica*, **81**, 372–377.

**Mosholder, A. (1993)** *Review and Evaluation of Clinical Data. Application NDA no. 20-272 (11 May 1993)*.

Washington, DC: Center for Drug Evaluation and Research, Department of Health and Human Sciences.

**Nordentoft, M., Laursen, T. M., Agerbo, E., et al (2004)** Development in suicide rates for patients with schizophrenia from 1981 to 1994 in Denmark. Twelfth Winter Workshop on Schizophrenia. *Schizophrenia Research*, **67** (suppl. 1), 215.

**Rennie, T. (1939)** Follow-up study of 500 patients with schizophrenia admitted to hospital from 1913 to 1923. *Archives of Neurology and Psychiatry*, **41**, 877–891.

**Saugstad, L. & Odegard, O. (1979)** Mortality in psychiatric hospitals in Norway 1950–1974. *Acta Psychiatrica Scandinavica*, **59**, 431–447.

**Southall, H. R., Aucott, P., Dorling, D., et al (2004)** *Great Britain Historical Database: Census Data, Age and Sex Statistics 1851–1971*. Colchester: Essex University.

**Tranter, R. & Healy, D. (1998)** Neuroleptic discontinuation syndromes. *Journal of Psychopharmacology*, **12**, 306–311.

**World Health Organization (1993)** *The ICD-10 Classification of Mental and Behavioural Disorders: Diagnostic Criteria for Research*. Geneva: WHO.