Suicide inside: a literature review on inpatient suicide

Report from the Conflict and Containment Reduction Research Programme

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Suicide is an enduring feature of all human societies throughout history. The rates, circumstances and reasons for the act vary over time and between places, being profoundly influenced by historical and cultural forces. At different times suicide has been outlawed or considered a sinful and immoral act. At others, in some circumstances it has been socially approved, for example at the behest of the emperor during Roman times, or to avoid shame in more recent times in Japan. In line with such cultural influences, suicide rates today vary considerably between different countries. According to the World Health Organisation, in the year 2000 "approximately one million people died from suicide, and 10 to 20 times more people attempted suicide worldwide" (World Health Organisation 2003). Thus suicide represents a major health problem, with one death occurring worldwide every 40 seconds. The WHO also provides evidence that suicide rates have increased up to 60% in the past 50 years in some countries, and that the pattern of risk has changed, with young people now making up the majority of suicides.

In England and Wales there are about 5,000 suicides every year, a quarter of whom have had contact with mental health services in the year prior to their death (Appleby et al. 2006). In-patient suicides are a small proportion of this total, but they are those receiving the most intensive care, and the provision of patient safety is the prime task of acute inpatient psychiatry (Bowers et al. 2005b).

Literature search

Electronic searches of the main databases were conducted to locate post-1960 empirical studies of inpatient suicides in English, German or Dutch. The databases searched were: PsycInfo, Cochrane, Medline, EMBASE Psychiatry, CINAHL and the British Nursing Index. The search term utilised was suicide. The following thesaurus terms were excluded as they referred to non-fatal acts of self-harm: Attempted Suicide, Suicidal Ideation, Suicide Prevention, Parasuicide and Self-Harm. Euthanasia was excluded as not relevant to psychiatric inpatient care. Following this initial search, the numbers of identified references were reduced by searching within the findings for any of the following terms: Psychiatric Inpatient$, Hospital$, Admit$ or Detain$. Resulting titles and abstracts were then inspected for relevance. Where there was any ambiguity, the original was obtained an inspected. As the literature accumulated, further references were obtained by following up citations. The final number of identified empirical studies was 98.

Methodologies of the studies reviewed

The largest number of studies consisted only of retrospective analyses of the case records of past inpatient suicides (n=36). Some studies examined trends over time or clustering, and therefore had a longitudinal element (n=28), with some of these also providing descriptive data. The coverage of these studies ranged from single hospitals drawing on locally collected data, through to large studies using national datasets.

A similar number of studies incorporated a case-control approach (n=30), thus enabling more sophisticated multivariate analyses, and more robust deductions about

the characteristics associated with inpatient suicides compared to other inpatients. However matched populations and criteria for matching varied by study, complicating comparisons. Sophistication of the statistical analyses varied, with earlier papers tending to present univariate analyses only, whereas later papers were more likely to also report multivariate comparisons. In addition, one study incorporated data on substantial numbers of outpatient as well as inpatient suicides (Goldney et al. 1985), while another was too poorly reported to yield any useful information (Medlicott & Medlicott 1969). In these latter cases, only relevant descriptive information was extracted for the review. The case control studies are summarised in Tables 1-3.

Table 1 Generic case control studies

Study	Suicide cases	Non-suicide controls	Matching	Scope	Country	Younger age	Male	Ethnic minority	Education	Employment	Live alone	Married	More/longer prev. adms.	DSH	Compulsory admission	Schizophrenia	Affective disorder	Drugs and/or alcohol	Neuroleptics	Antidepressants	Anxiolytics	Hypnotics	Lithium	Poly pharmacy	Side effects	Symptoms	Longer admission
Dong, Ho and Kan (2005)	92 inpatients	92 inpatients	Hospital and gender and partial matching for diagnosis and age	Nation, 3 years	Hong Kong					NS	NS	NS	NS	+*	NS				NS	NS	NS	NS	NS		+	Cases more likely to have anxiety, somatic and depressive symptoms on admission, and somatic and depressive symptoms at time of suicide*	
Ernst, Moser and Ernst (1980)	90 inpatients	27,833 discharges from the same hospital		Hospital, 20 years	Switzerland												+										+
Fernando and Storm (1984)	9 inpatients and 13 outpatients within 3 months of discharge	9 inpatients and 13 outpatients within 3 months of discharge	Therapeutic team involved, gender, admission date and age.	Hospital, 5 years	UK					NS		NS		+		-	NS		-	NS							
Gale, Mesnikoff, Fine and Talbott (1980)	60 inpatient suicides	31,887 admissions to the same five hospitals		Region, 2.5 years	USA	NS	NS	-							+	+	+										
Hunt, Kapur and Webb et al (2007)	222 inpatients	222 inpatient controls randomly selected from national database	Time of admission	Nation, 1.75 years	UK	NS	+*			+*	NS	NS	NS	+*		-	+*									Depressive symptoms more likely in cases	
Powell, Geddes, Deeks et al (2000)	97 inpatients	90 randomly selected inpatients from the same hospitals		Region, 30 years	UK	+	NS			NS	NS	NS	NS	+	+*	+	+								NS	Delusions, hopelessness, worthlessness or guilt, depressed mood were all more common in cases, hallucinations were no more frequent in either group	
Qin and Nordentoft (2005)	1461 inpatients (within a total national sample of suicides for the period)	1165 inpatients (from within a randomly selected population sample 20 times as large)	Age and gender	Nation, 16 years	Denmark								+				+									
Read, Thomas and Mellsop (1993)	27 inpatients	86 inpatients	Time of admission and ward	Region, 5 years	New Zealand	NS	NS	NS		NS		-	NS	+	+	+										+
Roy and Draper (1995)	37 inpatients	37 inpatients	Age and gender	Hospital, 21 years	Canada					NS	+	NS		+	+	+			NS	NS			NS				
Schlosser and Strehle-Jung (1982)	22 inpatients	3217 patients at the same hospital		Hospital, 6 years	Germany	+	NS					-		+		+										+
Shah and Ganesvaran (1997)	60 inpatients	60 inpatients	Time of admission	Hospital, 21 years	Australia	NS	NS							+		+			+	+							
Sharma, Persad and Kueneman (1998)	44 inpatients	44 inpatients	Age, gender and date of admission	Hospital, 35 years	Canada						NS	NS	NS	NS	+	+	+										+
Spiebl, Hubner-Liebermann and Cording (2002)	30 inpatients	21,062 inpatients at the same hospital		Hospital, 10 years	Germany				+*	+*			+	+			+										
Wolfersdorf, Keller and Kaschka (1997)	585 inpatients	475 controls from one hospital during one year		Region, 23 years	Germany	NS	NS									+	+										
Wolfersdorf, Klinkisch and Franke et al (2003)	64 inpatients	64 inpatients	Time of admission	Hospital, 22 years	Germany	+	NS						NS	+		+	+	-	+	+	+	+	+	+	NS	Cases were more depressed, agitated, and without hope. Cases also scored higher than controls on a number of positive psychotic symptoms such as hallucinations and paranoid delusions.	

*Multivariate, otherwise univariate test. All mutlivariate results wewre significant by univariate test

Table 2 Case control studies limited to specific diagnoses

Study	Suicide cases	Non-suicide controls	Matching	Scope	Country	Younger age	Male	Ethnic minority	Education	Employment	Live alone	Married	More/longer prev. adms.	DSH	Compulsory admission	Schizophrenia	Affective disorder	Drugs and/or alcohol	Neuroleptics	Antidepressants	Anxiolytics	Hypnotics	Lithium	Poly pharmacy	Side effects	Symptoms	Longer admission
SCHIZOPHRENIA																											
Farberrow, Schneidman and Leonard (1961)	30 male inpatients with schizophrenia	30 male inpatients with schizophrenia	Hospital, age, religion, marital status and year of suicide	Region, 3 years	USA									+												All cases were tense and agitated, restless and impulsive, driven. By contrast, the largest group of the controls was indifferent to location and other things, passive and accepting, had reached some form of adjustment to their illness. Most of the cases were improving or improved, not floridly psychotic. One group of cases had no insight.	
Krupinski, Fischer, and Grohmann et al (2000)	19 inpatients with schizophrenia	5333 inpatients with schizophrenia		Hospital, 11 years	Germany	NS	NS							+				NS	NS	+	NS	NS	NS			Cases had more affective symptoms (ruminations, delusions of guilt, thought insertion, hopelessness, low mood, feelings of unworthiness, free floating anxiety, suicidal ideation) and negative symptoms (apathy, psychomotor inactivity) but significantly less positive symptoms (self-referential delusions, paranoid delusions)	
Modestin, Zarro and Waldvogel (1992)	53 inpatients with schizophrenia	53 inpatients with schizophrenia	Year of admission, gender	Region, 14 years	Switzerland			-		-*				+*													+
Roy and Draper (1995)	28 inpatients with schizophrenia	13 inpatients with schizophrenia	Age and gender	Hospital, 21 years	Canada					NS	+	NS	NS	+	NS			NS		NS			NS				NS
Shah and Ganesvaran (1999)	62 inpatients with schizophrenia (inluding suicides within one month of discharge, excluding on leave more than one month)	22 inpatients with schizophrenia	Date of admission	Hospital, 21 years	Australia	NS	NS							+										+			
Stebiaj, Tavcar and Dernovsek (1999)	36 inpatients with schizophrenia	36 inpatients with schizophrenia	Age, gender, and partial match to year of hospitalisation	Hospital, 10 years	Slovenia									+												Lack of insight very strongly predicted suicide*, depression strongly predicted suicide*	
Wolfersdorf and Neher (2003)	80 inpatients with schizophrenia from 10 psychiatric hospitals	80 inpatients with schizophrenia from one hospital		Region, 2 years	Germany								NS	NS										+	+	Cases had more insight, more suffering and worries about their illness and their social situation	
AFFECTIVE DISORDER																											
Lehle (2005)	46 inpatients with depression randomly selected from 442 cases	46 inpatients with depression	Age, sex, number of previous admissions, year of admission, suicidality at the beginning of inpatient treatment	Region, 7 years	Germany														-	NS	+	+	-				
Stebiaj, Tavcar and Dernovsek (1999)	23 inpatients with affective psychosis	23 inpatients with affective psychosis	Age, gender, and partial match to year of hospitalisation	Hospital, 10 years	Slovenia									+												Lack of insight strongly predicted suicide*, depression very strongly predicted suicide*	
BORDERLINE PERSONALITY DISORDER																											
Kullgren (1988)	15 inpatients with Borderline Personality Disorder (included suicides within one month of discharge)	13 inpatients with Borderline Personality Disorder		Region, 19 years	Sweden	NS	NS																			No difference in severity of symptoms by two scales	

*Multivariate, otherwise univariate test. All mutlivariate results wewre significant by univariate test

Table 3 Case control studies contrasting in and outpatient suicides

Study	Suicide cases	Non-suicide controls	Matching	Scope	Country	Younger age	Male	Ethnic minority	Education	Employment	Live alone	Married	More/longer prev. adms.	DSH	Compulsory admission	Schizophrenia	Affective disorder	Drugs and/or alcohol	Neuroleptics	Antidepressants	Anxiolytics	Hypnotics	Lithium	Poly pharmacy	Side effects	Symptoms	Longer admission
King, Bladwin, Sinclair and Campbell (2001)	59 inpatients	106 outpatient suicides	Age, gender, admission date and diagnosis	Region, 10 years	UK									+	+											Depressive symptoms more likely in cases*	
Modestin and Hoffmann (1989)	49 inpatients	53 outpatient suicides within one year of discharge		Region, 10 years	Switzerland	NS	NS				-	-	+	+		+			-	-							
Sundqvist-Stensman (1987)	57 inpatients	271 outpatient suicides		Region, 7 years	Sweden	NS	-					NS	+	+		+		-									

*Multivariate, otherwise univariate test. All mutlivariate results wewre significant by univariate test

Both types of study have been conducted in different countries, where psychiatric systems and the means by which they were funded differed considerably. This reduces the certainty that findings from one country apply in another, but strengthens the likelihood that findings replicated across several countries will be widely applicable and generalisable. Reported studies were undertaken in a total of 17 countries (Table 4). Sample sizes varied, with one or two being very small (10-20 suicides). However many more were very large samples (several hundred suicides), enhancing the validity of the findings reported.

Table 4. Countries where studies were undertaken (one study covered three countries)

Country	No.
USA	21
Germany	20
UK	17
Switzerland	8
Finland	7
Australia	5
Sweden	5
Denmark	4
Canada	3
Netherlands	2
New Zealand	2
Austria	1
Hong Kong	1
Ireland	1
Japan	1
Norway	1
Slovenia	1

A qualitative element formed part of a smaller number of studies (n=14). Often the qualitative data consisted of case study material, much of it specifically related to the issue of suicide epidemics of clusters occurring at hospitals. One of these studies was a book, thus providing much detail (Kobler & Stotland 1964). Analysis of this data was generally weak, unsystematic, and poorly described. Nevertheless some earlier studies appear to have been conducted with great vigour and insight, and provide unique material on the topic.

The studies were conducted in various settings, ranging from private psychiatric hospitals, though general hospital psychiatric units to large state funded asylums. Patient populations therefore varied between settings. Older studies, reporting on patient populations of that time, may not be comparable with studies of modern services were all long term care and support occurs in the community rather than in hospital.

A definitional problem common to all studies of suicide is the level of certainty attaching to the retrospective judgement that a suicide has occurred. Some sociologists have argued that the process is so subjective that any count of suicides is an artefact of multiple social judgements and reconstructions with poor reliability (Garfinkel 1967). The studies described in this review varied in how their identified suicide cases. Some failed to say, assuming that inpatients suicides were so obvious as to not require definition. Other used verdicts from coroners or equivalent post-death

statutory investigations. However even here inclusion criteria varied, with some studies including only definite cases where there was a suicide verdict, and other including uncertain or 'open' verdicts on the grounds that these were nearly always suicides.

Making sense of the findings overall was not assisted by the overlapping of samples across multiple reports and analyses. Sometimes this means that a subsection of the main sample (Shah & Ganesvaran 1997) is analysed and reported in a second paper (Shah & Ganesvaran 1999), or completely different methodologies are applied to the same sample (Taiminen & Helenius 1994;Taiminen, Salmenpera, & Lehtinen 1992) which is relatively unproblematic. However sometimes the samples overlap so that it is difficult to argue that reported results are truly independent, a situation that occurs less importantly with some descriptive studies (Morgan & Priest 1984;Morgan & Priest 1991), but more critically in some longitudinal studies, especially those by a German research group (Keller & Wolfersdorf 1995;Wolfersdorf, Keller, & Kaschka 1997).

Although studies published later tend to be more sophisticated, there are some startling exceptions, for example a complex longitudinal analysis (Kahne 1968b) and an excellent, so far unreplicated, mixed method case control study (Farberrow, Schneidman, & Leonard 1961).

All the studies reported here include suicides of patients who were on agreed leave at the time, or who were absent from the ward without permission (absconded). However a few of the studies also include suicides in the post discharge period as 'inpatient' suicides, and the period of time covered varies between those studies. This is a further factor complicating comparisons, although there are reasonable grounds for including those patients who commit suicide in the immediate post-discharge period, as they are likely to have more in common with other inpatients than with those who suicide in the community without any inpatient admission.

Analytic procedure

The aim of the literature review project was to establish existing evidence for and against the working model and assess commonality and links between different conflict and containment types such as patient profiles, chains of events, patient experiences, circumstances of use, etc.

These aims therefore dictated how each paper was dealt with. A matrix was constructed in Excel with a number of headings ranging from the evidence the article provided for and against the working model; the methodology, sample, definitions and setting used in the article; the patient profiles (age, gender, ethnicity, diagnosis, marital status); the rates of occurrence; times and places or occurrence of the event; the patient's perceptions; circumstances of event; antecedents and causes; relationships between types of conflict/containment events; patient motivations; economics and cost and efficacy and outcome. Therefore, each article was reviewed and analysed by extracting data/evidence for the relevant sections in the matrix in addition to the quality and rigour of each study.

A hierarchy of evidence was established by the project manager (LB) to rate the weight of each study in relation to the project's aims. The most weight was given to those studies conducted in the UK, on acute wards and/or PICU and randomised trials. In the case of this particular topic, inpatient suicide, greater weight was given to case control studies with large samples, and to findings replicated across studies, than to simple retrospective descriptive studies.
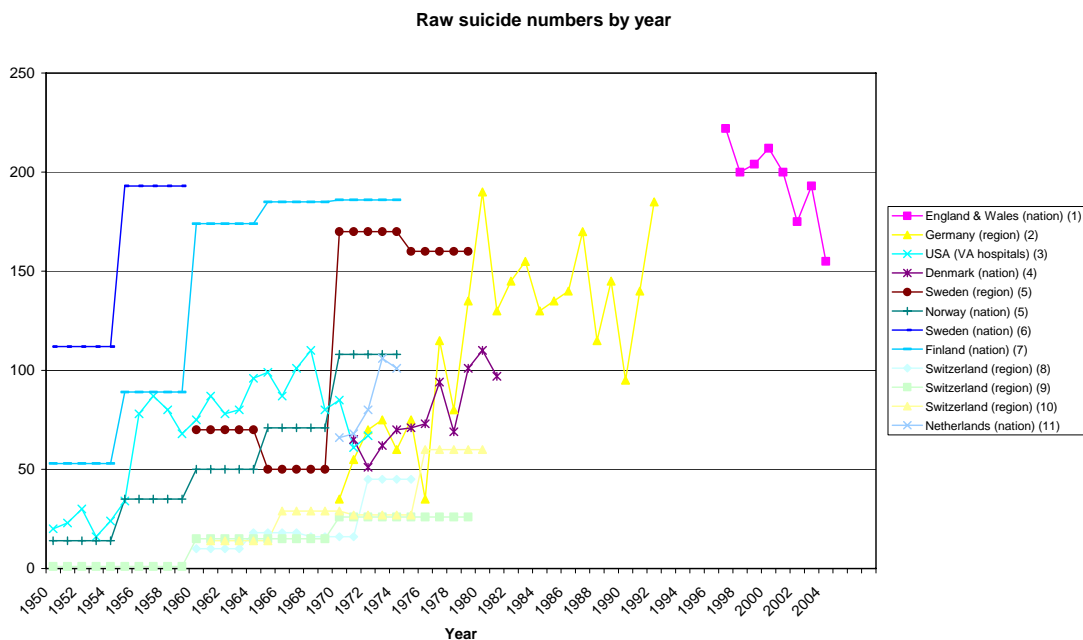
The incidence of in-patient suicide

The rate of inpatient suicide per 1000 admissions can vary hugely between different reports, ranging from 0.06 in one region of Germany in the 1960s (Koester & Engels 1979), to 5.66 in the USA during the same time period (Farberrow et al. 1971). As Table 5 below shows, this rate varies widely between locations and over time. Fourteen studies provide enough information to calculate and in-patient suicide rate per 100,000 head of population per year. Discounting two extreme outliers, this figure ranges from 0.28 (Department of Health 2001) to 2.8 (Fernando & Storm 1984;Sundqvist-Stensman 1987), and thus also shows considerable variation. Six studies allow the calculation of the rate of inpatient suicides as a proportion of all suicides, yielding figures ranging from 0.01 (Proulx, Lesage, & Grunberg 1997) to 0.15 (Brunnenberg & Bijl 1998). As none of these figures show much stability or commonality, the variation implies that inpatient suicide rates are strongly determined by social and service organisation factors.

Table 5. Inpatient suicide rates

Country	Period	Scope	Prop of all suicides	Rate per 1k adms pa	Rate per 100k population pa	Paper
Australia	1972-1982	Hospital		1.01		Goldney, Positano, Spence and Rosenman (1985)
Australia	1973-1993	Hospital		3.25		Ganesvaran and Shah (1997)
Austria	1987-1994	Region		1.32		Deisenhammer, DeCol, Honeder and Hinterhuber (2000)
Canada	1986-1991	Region	0.01		16.40	Proulx, Lesage and Grudberg (1997)
Denmark	1950-1964	Hospital		1.20		Jensen (1966)
Denmark	1971-1981	Nation			1.42	Barner-Rasmussen, Dupont and Bille (1986)
Finland	1964-1972	Region		1.40		Niskanen, Lonnqvist, Achte and Rinta-Manty (1974)
Finland	1967-1992	Hospital		0.40		Talminen and Helenius (1994)
Finland	1971-1987	Region		2.60	1.80	Taiminen and Lehtinen (1990)
Germany	1950-1976	Region		0.06		Gorenc and Bruner (1985)
Germany	1955-1970	Region		1.00		Ritzel (1974)
Germany	1962-1968	Region		0.06		Koester and Engels (1970)
Germany	1966-1984	Hospital		0.99		Armbruster (1986)
Germany	1970-1992	Hospital		1.99		Finzen, Oestereich and Hoffmann-Richter (1999)
Germany	1970-2003	Region		2.02		Wolfersdorf, Keller and Kaschka (1997)
Germany	1970-2003	Region		1.65		Wolfersdorf, Keller and Vogl et al (2007)
Germany	1972-1978	Hospital		4.25		Schlosser and Strehle-Jung (1982)
Germany	1989-1999	Hospital		0.76	0.34	Spiebl, Hubner-Liebermann and Cording (2002)
Germany	2001-2004	Region		0.54		Wolfersdorf, Franke, Franz and Mattern (2005)
Hong Kong	1997-1999	Nation	0.04	2.69	0.45	Dong, Ho and Kan (2005)
Ireland	1974-1993	Region			0.39	Coakley, Carey and Owens (1996)
Netherlands	1970-1974	Nation	0.07	2.07		de Graaf (1979)
Netherlands	1984-1999	Nation	0.15	1.52		Brunenberg and Bijl (1998)
New Zealand	1984-1989	Region		2.04		Read, Thomas and Mellsop (1993)
Norway	1965-1974	Nation		2.26		Hësso (1977)
Slovenia	1983-1993	Hospital		2.43		Stebiaj, Tavcar and Dernovsek (1999)
Sweden	1977-1984	Region		1.60	2.80	Sundqvist-Stensman (1987)
Switzerland	1920-1979	Hospital			18.80	Maier (1981)
Switzerland	1961-1980	Region		1.80		Modestin (1982)
Switzerland	1971-1981	Region		4.52		Modestin and Hoffmann (1989)
UK	1963-1992	Region		1.37		Powell, Geddes, Deeks et al (2000)
UK	1972-1981	Region			0.66	Langley and Bayatti (1984)
UK	1976-1981	Hospital		4.30	2.80	Fernando and Storm (1984)
UK	1977-1985	Region			0.63	Goh, Salmons and Whittington (1989)
UK	1987-1991	Region			0.33	Blain and Donaldson (1995)
UK	1996-2000	Nation	0.04		0.28	Department of Health (2001)
UK	2000-2004	Nation	0.04		0.39	Appleby, Shaw and Kapur et al (2006)
USA	1946-1962	Hospital		0.78		Chapman (1965)
USA	1959-1966	Nation		5.66		Farberrow, Ganzler, Cutter and Reynolds (1971)
USA	1975-1977	Region		1.90		Gale, Mesnikoff, Fine and Talbott (1980)

Rises and falls in rates over time: Some papers were either longitudinal in nature, or conducted some form of longitudinal analysis of inpatient suicide rates. The form these analyses have taken, and therefore the findings, show great variety. Two studies, based on overlapping data sets, argued that a decrease in inpatient suicides had occurred in England between 1997-2004, without being able to offer any evidence on the cause of this decline (Appleby, Shaw, Kapur, Windfuhr, Ashton, Swinson, & While 2006;Kapur et al. 2006). Another examined trends in Australia 1973-1993, arguing that a decline had occurred after 1985, and suggesting that new mental health legislation introduced in 1987 might account for this (Ganesvaran & Shah 1997). However a similar study that evaluated the impact of new mental health legislation in Austria 1987-1994 found no change (Deisenhammer et al. 2000). An earlier time period was covered by a study of ten hospitals in Germany (Gorenc & Bruner 1985) and showed an increase in suicide between 1950-59 and 1967-76, although this was not associated with changes in hospital staffing. Several other studies report rising trends in suicides: in one region of Sweden, 1960-79 (Perris, Beskow, & Jacobsson 1980); in one Swiss hospital 1900-77 (Ernst 1979); two regions of Switzerland 1961-80 (Modestin 1982); one region of Germany 1970-92, showing a rise during the 1970s followed by a lesser decrease thereafter (Keller & Wolfersdorf 1995); one region of Finland 1971-87 (Taiminen & Lehtinen 1990); one Swiss hospital 1960-80 (Ernst, Moser, & Ernst 1980), and in three Scandinavian countries 1930-74 (Hesso 1977). All studies providing raw inpatient suicide numbers over time for areas greater than a single hospital are included in Chart 1 below.

Chart 1. Longitudinal raw inpatient suicide numbers over time (some values have been multiplied by a constant to aid comparison between large and small studies)

Raw suicide numbers by year

(1) Appleby, Shaw and Kapur et al (2006); (2) Keller and Wolfersdorf (1995) [x5]; (3) Wolfersdorf, Keller, Scmidt-Michel et al (1988); (4) Barner-Rasmussen, Dupont and Bille (1986); (5) Perris, Beskow and Jacobsson (1980) [x50]; (5-7) Hësso (1977) [x5]; (8) Ernst, Moser and Ernst (1980) [x4]; (9) Maier (1981) [x100]; (10) Modestin (1982) [x5]; (11) de Graaf (1979)

Explanations for these rises are offered, usually without additional evidence, and vary according to the idiosyncratic interpretations of authors, including: the opening of

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ward doors (Ernst 1979;Keller & Wolfersdorf 1995); increases in patients rights, changes in pharmacotherapy and psychotherapy, and increasing use of weekend leave (Keller & Wolfersdorf 1995); more suicidal patient admitted, or more stigma resulting in more pressure, or reductions in medical power leading to less competent nursing staff being in charge (Hesso 1977;Perris, Beskow, & Jacobsson 1980). In one paper authors proposed that greater psychiatric liberalisation was to blame (more patient freedoms, more agreed leave, fewer restrictions), however their data did not support this theory in that in the final five year time period liberalism declined while suicides sharply rose (Ernst, Moser, & Ernst 1980). A study covering the whole of Denmark 1971-1981 found significantly increasing rates in provincial and rural areas, and offered the interpretation that trends of increased suicides in large conurbations are followed by delayed trends in provincial areas (Barner-Rasmussen, Dupont, & Bille 1986). However this is in the absence of any evidence for a preceding rise in large conurbations. This study demonstrated that national trends can be the product of countervailing regional trends, as suicide rates reduced in the Copenhagen area whilst increasing in rural areas. Moreover, it showed higher rates of inpatient suicide in association with greater urbanisation. Not all studies report rising rates, as one carried out in a region Switzerland with patients suffering from schizophrenia, 1973-87 found no differences in numbers by year (Modestin, Zarro, & Waldvogel 1992).

Several studies suggest that in-patient suicides rates may not correlate with general population suicide rates (Ganesvaran & Shah 1997;Keller & Wolfersdorf 1995), whereas one national study shows a non-statistically significantly associated decline in both rates (Appleby, Shaw, Kapur, Windfuhr, Ashton, Swinson, & While 2006). If this disconnection was eventually supported by larger and longer studies, this would suggest different causational factors for inpatients, or changes in which patients get in or outpatient care.

In all the studies examining trends in inpatient suicide rates, either admission or discharge rates are taken into account, and rises in rates are still demonstrated. However it is striking that for all studies depicted in Chart 1, admission rates were rising, except for the most recent data from England, where admission rates are declining. Thus the inpatient suicide rate correlates strongly with the admission rate. Rises and falls in admission rates do not necessarily mean greater numbers of patients at risk, as occupancy can remain unchanged. It is therefore a possibility that admissions might have a curvilinear (exponential) positive correlation with inpatient suicide.

Changes in trends of hospital suicide rates clearly occur over time, and must be meaningful; however explaining them on an empirical rather than intuitive basis is difficult. Without the use of more complex longitudinal methodologies, with large datasets over extended periods of time, such changes are susceptible to an indefinite number of possible explanations.

Evidence for and against the working model

Three small sample (11-15 suicides) retrospective studies show an association between rejection and negative attitudes from staff and completed suicide, termed by some of these authors 'malignant alienation' (Kullgren 1985;Morgan & Priest 1984;Morgan & Priest 1991). One of these three studies was specifically about Borderline Personality Disorder patients only (Kullgren 1985). A larger retrospective descriptive study showed that two thirds of suicide patients were considered as difficult and troublesome by staff (Niskanen 1974), and a qualitative study found unprofessional and punitive staff attitudes towards most of the patients who committed suicide, although a smaller number demonstrated the reverse, with lax and permissive relationships (Rotov 1970). However a case control study showed no difference in evidence for a poor staff/patient relationship between cases and controls (Powell et al. 2000). One small retrospective qualitative study of 14 suicides reported only two cases for which the case records provided any evidence that 'malignant alienation' occurred (Haw 1994). Another, based on detailed interviews with all clinicians involved in suicide cases, could find no evidence of countertransference or covert hostility (Kahne 1968a), but did find a significant association with staff turnover in ther month preceding a suicide (Kahne 1968b).

Two reports from the National Confidential Inquiry (Appleby, Shaw, Kapur, Windfuhr, Ashton, Swinson, & While 2006;Department of Health 2001) indicate that suicides are seen by staff involved as preventable through more staff, better staff training, and better staff communication, however this is susceptible to other interpretations not compatible with the model (e.g. greater risk assessment expertise and more consistent, targeted containment, not greater engagement and better communication with patients). Two accounts of suicide clusters, on the basis of co-occurrence, have suggested that divisions in the clinical team might trigger inpatient suicides (Anon 1977;Coser 1976).

Some qualitative studies have indicated there might be a link between staff turnover, particularly senior staff, and the occurrence of suicide clusters (Haw 1994;Kobler & Stotland 1964;Taiminen, Salmenpera, & Lehtinen 1992). One case-control study showed an association between suicide and change/absence of the keyworker or consultant psychiatrist (King et al. 2001), however another similar but larger study showed no such association (Dong, Ho, & Kan 2005). A well conducted longitudinal study accompanied by statistical testing found some evidence for a link between staff turnover and suicide (Kahne 1968b), whereas another less rigorously conducted longitudinal study concluded the same without subjecting the data to statistical test (Coser 1976).

The data reported by some qualitative studies can be interpreted to show that staff demoralisation and/or increased, anxiety-driven use of containment methods triggers inpatient suicides (Flinn, Slawson, & Schwartz 1978;Kobler & Stotland 1964;Taiminen, Salmenpera, & Lehtinen 1992). However all of these are retrospective accounts of suicide clusters, and the direction of causality could equally well be in the reverse direction, i.e. the sequence of suicides causing anxiety and demoralisation of the staff.

Although there are two studies demonstrating a link between inpatient suicide and relationships, the important relationships were those with family, not those with the staff (Farberrow, Schneidman, & Leonard 1961;Hoffmann-Richter et al. 1999).

Although this indicates that some sort of psychosocial intervention might be required to avert suicide, it does not show that staff attitudes or ward structure are of any importance. Some studies may indicate a link between seclusion and suicide, perhaps in the sense that the conflict with staff and withdrawal of support triggers the suicide, but these studies are both old and their methodology is descriptive (Beisser & Blanchette 1961;Rotov 1970).

This evidence is far from convincing. Small scale and qualitative studies seem to be contradictory in their findings, with some supporting staff disturbance and poor relationships as causative factors, and others not. The larger, more rigorously conducted studies with stronger methodologies, with one exception (King, Baldwin, Sinclair, & Campbell 2001), do not support this hypothesis (Dong, Ho, & Kan 2005;Kahne 1968b;Powell, Geddes, Deeks, & Goldacre 2000). Support for the working model is therefore minimal and weak in the inpatient suicide literature.

Points the working model has missed

Severity and duration of illness: Retrospective descriptive studies show high numbers of previous admissions among suicide cases, ranging from 35% (Graaf 1979) of suicides with previous admissions to 100% (Gale et al. 2007), with a mean across studies of 78% (65% weighted by number of suicides in the study). Other similar studies using a slightly different form of the same variable showed between 28% (Appleby, Shaw, Kapur, Windfuhr, Ashton, Swinson, & While 2006) and 34% (Niskanen 1974) had more than five previous admissions. One case control study showed an association with chronic illness (Powell, Geddes, Deeks, & Goldacre 2000) and another showed the suicides to have had a higher cumulative length of stay. Two studies contrasting in-patient and post-discharge suicides showed the in-patient group were more likely to have had previous admissions (Modestin & Hoffman 1989;Sundqvist-Stensman 1987). However evidence on previous admissions from the generic case control studies is more divided, with four showing a positive association (Powell, Geddes, Deeks, & Goldacre 2000;Qin & Nordentoft 2005), and four showing no difference (Dong, Ho, & Kan 2005;Hunt et al. 2007;Read, Thomas, & Mellsop 1993), both positions supported by strong, large sample studies. There are indications that these relative risks differ by diagnosis, with chronicity being associated with greater risk particularly in schizophrenia, with one large scale national study from Denmark showing that suicides with schizophrenia had spent more time in hospital than suicides with affective disorder (Barner-Rasmussen 1986). These findings allow no clear interpretation, and suggest that further analysis of different subgroups might deliver more reproducible results.

Leave: A substantial minority of in-patient suicides occur when while the patient is on agreed leave. The rate varies from none in a rather old study from the USA (Beisser & Blanchette 1961) to 81% (Dong, Ho, & Kan 2005), with a mean across the studies of 40% (weighted 41%). One study allowed the comparison of patients who committed suicides on leave with those who committed suicide on the ward or whilst absconded (Appleby, Shaw, Kapur, Windfuhr, Ashton, Swinson, & While 2006). Patients who committed suicide on leave were: less likely to be unemployed, or homeless, or have a history of violence, or alcohol or drug use, be considered an immediate suicide risk, be detained under the mental health act, or die during the first

week of admission; and were more likely to be living alone and to die during a period when discharge was being planned. Given that on average more than a third of suicides take place during agreed leave, it is surprising that only one study has examined such cases in detail and separately (Hoffmann-Richter, Oesterreich C, Wunstorf, & Finzen 1999). In this study from Switzerland, 14 suicides occurring during weekend leave over a 13 year period at one hospital were scrutinised. Most of the suicides took place in patients' homes, and the majority (79%) were confronted with emotional conflicts with spouse, parents or children during their leave.

Timing of suicides (time of day): Two small studies found evidence that suicides were more likely in the late afternoon, between 3 and 6 p.m. (Vollen & Watson 1975), and between 2 and 8 p.m. (Ritzel 1974). Another larger study showed an association with mornings, based on a single locality 112 suicide sample (Powell, Geddes, Deeks, & Goldacre 2000), a similar sized study also showed an association with mornings, in this case between 5 and 7 a.m. (Beisser & Blanchette 1961), another showed no relationship (Gale, Mesnikoff, Fine, & Talbott 2007), and two nationwide studies in England with samples sizes of many hundreds showed a clustering of suicides in the evening and nights, with 40-50% of suicides occurring within the hospital taking place at these times (Appleby, Shaw, Kapur, Windfuhr, Ashton, Swinson, & While 2006;Department of Health 2001). These contrasting results may reflect variation in hospital routines across different locations and periods, providing different opportunities for patients to act unsupervised by staff.

Timing of suicides (day of week): For the obvious reason that agreed leave is given more often at weekends, suicides of patients on leave happen at that time (Powell, Geddes, Deeks, & Goldacre 2000). One small study of 22 suicides shows an increased frequency on Mondays and Saturdays (Vollen & Watson 1975), and another, also of 22 suicides highlighting Monday (Schlosser & Strehle-Jung 1982), however other much larger studies reporting day of the week show no significant association (Appleby, Shaw, Kapur, Windfuhr, Ashton, Swinson, & While 2006;Department of Health 2001;Gale, Mesnikoff, Fine, & Talbott 2007;King, Baldwin, Sinclair, & Campbell 2001;Vollen & Watson 1975). Overall these results indicate no difference by day of the week.

Timing of suicides (during the admission): The timing of the suicide during the admission is presented in different ways by different studies, and comparisons are made more complex by the fact that earlier data includes many long stay chronically ill patients, whereas in later datasets similar patients no longer resided long term in the hospitals. Nevertheless, there is considerable support for the proposal that suicides are more likely to occur early in an admission. In a national study of Denmark covering 12 years, 44% of inpatient suicides occurred within two weeks, and 60% within a month of admission (Barner-Rasmussen 1986). There were additional interesting differences by diagnosis in this study, with patients suffering from affective disorder far more likely to have committed suicide within the first month of admission (95%), whereas for patients with schizophrenia 35% committed suicide within the first month and 9% after more than a year in hospital. In one study suicides of depressed patients were contrasted with suicides of other diagnoses, and a trend was found for affective disorder patients to commit suicide earlier in the admission (Lehle 2005). Use of a UK national dataset also demonstrated that risk of suicide was twice as high during the first week of admission (Copas & Robin 1982). Many studies providing descriptive

statistics also show high numbers of suicides within the earlier stages of an admission (Blain & Donaldson 1995;Busch, Fawcett, & Jacobs 2003;Deisenhammer, DeCol, Honeder, & Hinterhuber 2000;Dong, Ho, & Kan 2005). A case control study of patients with schizophrenia only, where matching also occurred for year of admission and gender, showed that suicide in this group of patients was more likely with longer length of stay (Modestin, Zarro, & Waldvogel 1992). Another case control study with a subgroup analysis of patients with schizophrenia also showed a positive association with longer length of stay (Roy & Draper 1995). Longer length of stay was also significantly associated with suicide in another case control study where matching occurred for time of admission and ward (Read, Thomas, & Mellsop 1993). Although this study covered all diagnoses, 63% of the suicide sample suffered from schizophrenia, and the diagnosis was also positively differentiated the suicides from controls. However three other generic case control studies also showed an association between suicide cases and longer length of stay (Sharma, Persad, & Kueneman 1998), although samples had large numbers of affective disorder patients. Overall these results fit a picture in which the highest risk is early in an admission, but that risk extends for substantially longer for patients with schizophrenia than for patients with affective disorder.

Timing of suicides (clustering and contagion): Several studies and reports have been instigated by the occurrence of a spate or 'epidemic' of suicides at a single hospital (Table 6). Such events typically arouse anxiety and concern, stimulating investigation to identify any potential causes that can be rapidly addressed to prevent further suicides. The published accounts of suicide clusters are summarised in the table below. Two main mechanisms are suggested by authors: patients copy each other; and decreases in staff competence/confidence secondary to organisational change. Of these, the former seems to be more robustly supported, but only in the case of some reports (Rissmiller & Rissmiller 1990;Taiminen, Salmenpera, & Lehtinen 1992), not all. The latter explanation leads to questions about why suicide clusters are not as prevalent as organisational change and staff demoralisation. Few of these cluster accounts apply statistical tests to examine the hypothesis that the cluster itself exists as an anomaly. Of the two that do, only one finds the cluster significant (Haw 1994). Even here one can question a procedure that tests after an apparent cluster has occurred, as such a procedure is not applied in the very many other cases where nothing has happened. Only one study of inpatient suicides has examined a large dataset for clusters. A retrospective analysis of suicides at two large (6-700 bed) Swiss psychiatric hospitals, 1977-86, looked for clustering of inpatient suicides using chi square and binomial tests on intervals between suicides, obtaining a null result (Modestin & Wurmle 1989). However this ten year period was relatively short. If suicide clusters do occur, they seem to be exceedingly rare.

Table 6. Studies of suicide clusters

Study	Duration (months)	Number of suicides	Statistically significant	Mechanism
Anon (1977)	6	3	Not tested	Divided leadership, staff turnover
Coser (1976)	12 each wave	6 & 7 (2 occasions)	Not tested	Poor teamwork and leadership leading to decreased staff confidence
Crawford and Willis (1966)	12 each wave	2 (x4 occasions)	Not tested	Copycat, for each of the four pairs the method/location was the same
Haw (1994)	12	14	Yes	Hospital under threat of closure, coupled with staff changes. Although many of the patients knew each other, there was little copying of method.
Kahne (1968)	36	16	Not tested	No clear explanation offered - perhaps lack of therapist experience.
Kobler and Stotland (1964)	12	4	Not tested	Collapse of staff confidence, staff turnover, anxiety and excessive containment
Langley and Bayatti (1984)	30	16	Not tested	Absence of senior clincian on leave, hospital reorganisation
Rissmiller and Rissmiller (1990)	12	2 (+2 attempts)	Not tested	Publicity (i.e. copycat, all from the same bridge and all patients known to each other). Deterioration of structure and leadership through staff turnover within an enmeshed social system.
Talminen, Salmenpera, and Lehtinen (1992), Talminen and Helenius (1994)	3	6/8	Not significant	Copycat, same method and location used by 4 of 6, patients known to each other, some witnessed others suicide, some had psychotic thoughts and experiences of preceding suicides.

Profile of patients

Age: The mean age of inpatient suicides, where declared by studies, falls between 29 (Flinn, Slawson, & Schwartz 1978) and 52 (Coakley, Carey, & Owens 1996) years of age, with a mean across studies of 41 (42 weighted). Other studies reports median values, but these are very similar, averaging 36 years across studies (40 weighted). Of case control studies not using age as a matching variable, three studies found suicide cases to be significantly younger, whereas 11 found no difference. Case control studies comparing specific diagnoses, inpatient suicides to outpatient suicides, and inpatient suicides to suicides in the post-discharge period, also found no age differences.

Gender: Although the vast majority of studies show that male inpatient suicides are more frequent than female (n=44, US Veterans Administration studies excluded), three studies show an even balance and 11 show more female suicides than male. This does not appear to be related to the year of the study data, or the country in which the study was conducted. Most case control studies found no differences between cases and controls (Gale, Mesnikoff, Fine, & Talbott 2007;Kullgren 1988;Powell, Geddes, Deeks, & Goldacre 2000;Read, Thomas, & Mellsop 1993;Roy & Draper 1995;Shah & Ganesvaran 1997). However one report found suicides more likely to be male (Hunt, Kapur, Webb, Robinson, Burns, Turnbull, Shaw, & Appleby 2007), by both univariate and multivariate analysis, in a very strong and well conducted study with a large sample. One study comparing inpatient to outpatient suicides found no difference (Modestin & Hoffman 1989), whilst another found the fewer men among the inpatient suicides (Sundqvist-Stensman 1987). The preponderance of evidence is therefore that there is no difference, although there remains a degree of uncertainty.

Previous admissions/duration of previous inpatient stays: Across the studies reporting this variable, most show a high proportion of inpatient suicides have had at

least one previous admission (78%, weighted 65%). A number of case control studies find a positive association between this variable and suicide (Powell, Geddes, Deeks, & Goldacre 2000;Qin & Nordentoft 2005;Schlosser & Strehle-Jung 1982;Spiebl, Hubner-Liebermann, & Cording 2002;Wolfersdorf et al. 2003), whereas some other very large studies do not (Dong, Ho, & Kan 2005;Hunt, Kapur, Webb, Robinson, Burns, Turnbull, Shaw, & Appleby 2007;Read, Thomas, & Mellsop 1993). Two studies with samples of schizophrenia sufferers only also find no difference (Roy & Draper 1995;Wolfersdorf & Neher 2003). Studies contrasting in and outpatient suicides also find an association of inpatients suicides with previous admissions (Modestin & Hoffman 1989;Sundqvist-Stensman 1987). These findings seem to be fairly evenly divided, therefore no conclusion can be drawn.

Diagnosis (general): Obtaining an overview of diagnosis is complicated by differing terminology and diagnostic systems between studies, coupled with the use of unstandardised procedures mainly based on case records. It is also likely that differing psychiatric service organisation had a major impact on populations admitted to hospital, affecting the results obtained. Even the most simplified figures are very variable. The proportion of in-patient suicides suffering from schizophrenia ranged from 9% (Fernado & Storm 1984) to 89% (Chapman 1965) and the proportion suffering from affective disorder ranged from 12% (Gale, Mesnikoff, Fine, & Talbott 2007) to 86% (Busch et al. 1993). Overall 10 studies showed more sufferers of schizophrenia than affective disorder amongst inpatient suicides, and 17 the reverse. Generic case control studies not using diagnosis as a matching variable also show differing results, with 9 showing suicide more likely amongst patient suffering from schizophrenia, 7 affective disorder, and in three of these studies both diagnoses were significantly associated with suicide. In only one small study schizophrenia was inversely associated with suicide (Fernado & Storm 1984). Of studies comparing in and outpatient suicides, two report significantly more schizophrenia in the inpatient group (Sundqvist-Stensman 1987). One other paper provides a single table comparing the diagnostic profile of inpatient suicides compared to suicides within one year of discharge (Barner-Rasmussen 1986). This data is not subjected to statistical test, but shows more schizophrenia, manic depressive psychosis and reactive psychosis, and less substance use in the in-patient group. One generic case control study also shows drug and alcohol use to be less common amongst inpatient suicides, two other provide non significant findings, and one shows higher use amongst female suicides (Qin & Nordentoft 2005). However in those studies comparing in and out patient suicides, two show substance use to be less common among the inpatients. Only one study reported secondary diagnoses, showing a high proportion of a suicide cluster to be suffering from some degree of personality disorder (Haw 1994). However several case control studies have examined the issue of depressive symptoms as opposed to formal diagnoses, and found these to be more common among inpatient suicides. (Dong, Ho, & Kan 2005;Hunt, Kapur, Webb, Robinson, Burns, Turnbull, Shaw, & Appleby 2007;Powell, Geddes, Deeks, & Goldacre 2000;Wolfersdorf, Klinkisch, Franke, Keller, Wurst, & Dobmeier 2003), as have case controls studies of schizophrenia (Krupinski et al. 2000;Stebiaj, Tavcar, & Dernovsek 1999;Wolfersdorf & Neher 2003), as well as contrasts between in and outpatient suicides (King, Baldwin, Sinclair, & Campbell 2001). Other findings in relation to symptoms are very mixed. Diametrically opposite results in relation to insight and negative symptoms have been found, however two studies agree in finding fewer positive symptoms among the suicide cases. One of these studies (Farberrow, Schneidman, & Leonard

1961), based on qualitative analysis, suggests that there are differing subgroups of inpatient schizophrenic suicides: (i) unnaccepting patients who rejected hospitalisation, had no insight, and who were grossly disturbed on admission, restless, impulsive and occasionally assaultive, without depressive symptoms but commonly with a history of suicidal activity or ideation; (ii) dependent satisfied patients who had good insight and depended on the hospital for help, were commonly depressed, requesting treatment, improved in hospital but became disturbed during discharge planning and mostly committed suicide during agreed leave; (iii) dependent dissatisfied patients, similar to dependent satisfied patients but believing they were not getting the treatment they needed and thus becoming more demanding and seeking reassurance, and most commonly committing suicide inside the hospital. It can be concluded, therefore, that both the schizophrenia and affective disorder groups are at higher risk, and drug/alcohol users at lower risk (during inpatient treatment), but the comparative levels of those risks vary locally due to unknown factors. In addition the presence of depressive symptoms is also associated with inpatient suicide.

Pharmacological treatment: Generic case controls studies show a positive association with the prescription of neuroleptics in two studies, and inverse relationship in one, and no significance in a fourth. Diagnosis specific studies are similarly divided. Even though an association between suicide and depressive symptoms is well established, results from the cases control studies are divided again, with only three out of seven showing a positive association. These results are confusing and inconsistent, and no conclusions can be drawn from them. Differing results are possibly representative of diagnostic and prescribing practices which vary over time and place.

Marital status: The proportion of in-patient suicides who were not married (i.e. single, divorced or widowed) also varied, ranging from 33% (Hoffmann-Richter, Oesterreich C, Wunstorf, & Finzen 1999) to 89%. (Read, Thomas, & Mellsop 1993), with a mean across studies of 64% (69% weighted). Most case control studies found no difference by marital status (Goldney, Positano, Spence, & Rosenman 1985;Powell, Geddes, Deeks, & Goldacre 2000;Roy & Draper 1995;Sharma, Persad, & Kueneman 1998), but two found suicides were less likely to be married (Read, Thomas, & Mellsop 1993). Comparisons between in and out patient suicides were also split, with one finding no difference (Sundqvist-Stensman 1987), and the other that suicide was less likely among inpatients who were married (Modestin & Hoffman 1989). Overall, the evidence suggests that marital status is not associated with in-patient suicide.

Employment: Data on this issue is difficult to interpret, as countries differ in their administrative categorisations in relation to mental disability, and this impacts upon the numbers of patients counted as 'unemployed'. Some studies count the unemployed and long term sick together, further complicating any attempt at synthesis. The highest figure of is 92% of suicides unemployed (Roy & Draper 1995) and the lowest 15% (Schwartz, Slawson, & Flinn 1975), with a mean across studies of 49% (57% weighted). Most of the case control studies showed no association between employment status and in-patient suicide (Powell, Geddes, Deeks, & Goldacre 2000;Roy & Draper 1995;Sharma, Persad, & Kueneman 1998), with one study showing suicides were more likely to be unemployed (Goldney, Positano, Spence, & Rosenman 1985) and two showing suicides were less likely to be unemployed (Hunt,

Kapur, Webb, Robinson, Burns, Turnbull, Shaw, & Appleby 2007). One case control study contrasting in-patient with post-discharge suicides also reported significantly less unemployment amongst the in-patient suicides (Modestin & Hoffman 1989), but in another case control study of schizophrenia only, early vocational difficulties were associated with suicide (Modestin, Zarro, & Waldvogel 1992). These contradictory findings do no allow any firm conclusion to be drawn.

Educational qualifications: Data on educational qualifications of suicides are not presented in any format that makes comparison possible, and in any case only a few studies have included an examination of this variable. Those case control studies which have explored this have mainly found no connection between educational level attained and risk of suicide (Goldney, Positano, Spence, & Rosenman 1985;Sharma, Persad, & Kueneman 1998). One case control study found a positive association between suicide and more education (Spiebl, Hubner-Liebermann, & Cording 2002). Another study found a trend towards greater education being associated with less risk of suicide for men, and a significant association in the reverse direction (greater education, higher risk) in women (Gale, Mesnikoff, Fine, & Talbott 2007). This latter study raises interesting questions about the heterogeneity of in-patient suicides, a topic explored further below.

Ethnicity and religion: Given international variation in populations and affiliations, simple descriptive frequencies are uninformative. In any case, few studies report these data. One case control study shows no difference in risk by ethnicity (Read, Thomas, & Mellsop 1993), whereas another shows suicides more likely to be from the majority population (Gale, Mesnikoff, Fine, & Talbott 2007). In a study of schizophrenia undertaken in Switzerland, suicide was associated with not being foreign born (Modestin, Zarro, & Waldvogel 1992). Two case control studies have tested the significance of religion, with neither finding any association (Goldney, Positano, Spence, & Rosenman 1985;Sharma, Persad, & Kueneman 1998).

Legal status: Because of variation in mental health legislation and practice, it is not meaningful to provide information on proportions of suicides compulsorily detained in hospital. However some case control studies show legal detention to be associated with suicide (Gale, Mesnikoff, Fine, & Talbott 2007;Goldney, Positano, Spence, & Rosenman 1985;Read, Thomas, & Mellsop 1993;Roy & Draper 1995), but one shows the opposite (Hunt, Kapur, Webb, Robinson, Burns, Turnbull, Shaw, & Appleby 2007), and another no relationship at all (Dong, Ho, & Kan 2005). Each of these studies was conducted in a different country under a different legal system, with positive associations being shown in Canada, Australia, New Zealand and the USA, an inverse association in England and Wales, and no relationship in Hong Kong. One further case control study comparing inpatient and post-discharge suicide also shows previous compulsory detention significantly associated with the inpatient group (King, Baldwin, Sinclair, & Campbell 2001).

Forensic history (previous conviction for an offence): Two of the case control studies show no association of this variable with suicide cases (Dong, Ho, & Kan 2005;Read, Thomas, & Mellsop 1993), and one shows an inverse association (Powell, Geddes, Deeks, & Goldacre 2000). Only a comparison of inpatient with post-discharge suicides shows an association of previous delinquency with the inpatient group (Modestin & Hoffman 1989).

Living arrangements: A few studies have assessed whether living alone is associated with in-patient suicide. Only one found such an association (Roy & Draper 1995), whereas five others found no relationship to this variable (Dong, Ho, & Kan 2005;Goldney, Positano, Spence, & Rosenman 1985;Hunt, Kapur, Webb, Robinson, Burns, Turnbull, Shaw, & Appleby 2007;Powell, Geddes, Deeks, & Goldacre 2000;Sharma, Persad, & Kueneman 1998), and one comparison of in-patients with post-discharge suicides showing that the inpatients were less likely to live alone (Modestin & Hoffman 1989).

Family relationships: Some studies indicated that difficulties in family relationships were associated with suicides. For patients committing suicide during weekend leave, facing such difficulties was a common issue (Hoffmann-Richter, Oesterreich C, Wunstorf, & Finzen 1999). A further descriptive study shows nearly half of suicide cases were rejected by family members and forced to consider discharge to alternative accommodation (Gale, Mesnikoff, Fine, & Talbott 2007). One generic case control study shows no significant association of relationship difficulties to suicide (Powell, Geddes, Deeks, & Goldacre 2000). However it is possible that relationship difficulties are more important in relation to suicides of inpatients with schizophrenia. Two case control studies specifically of patients with schizophrenia have identified relationship difficulties as being associated with suicide. The first, a quantitative study, showed that inpatient suicides were five times more likely to have relationship difficulties (Stebiaj, Tavcar, & Dernovsek 1999). The second, a more qualitative study, showed that male suicide patients either didn't want to leave hospital at all, or found home to be tense and unsupportive (Farberrow, Schneidman, & Leonard 1961).

Family history of suicide: One case control study reports this to be a feature of suicides with schizophrenia (Modestin, Zarro, & Waldvogel 1992), but two general case control studies find it not to be statistically significant (Dong, Ho, & Kan 2005;Powell, Geddes, Deeks, & Goldacre 2000), as does one comparison of inpatient vs. outpatient suicides (King, Baldwin, Sinclair, & Campbell 2001). It is possible that past experience of this event may be more salient and important for people who suffer from schizophrenia.

Interactions between features of in-patient suicides: Gender appears to be important, with male in-patient suicides (just as with suicides in general) using more violent means (Goldney, Positano, Spence, & Rosenman 1985;Morgan & Priest 1991;Powell, Geddes, Deeks, & Goldacre 2000;Sletten et al. 1972). Interactions between gender and employment have also been reported (Gale, Mesnikoff, Fine, & Talbott 2007). There is also some support across several studies for the possibility of at least two different in-patient suicide groups, the first being younger, male, unemployed, suffering from schizophrenia and single, and the second being older, female, divorced/separated and suffering from affective disorder (Blain & Donaldson 1995;Busch, Clark, Fawcett, & Kravitz 1993;Goh, Salmons, & Whittington 1989;Langley & Bayatti 1984;Morgan & Stanton 1997;Roy & Draper 1995;Schwartz, Slawson, & Flinn 1975;Sharma, Persad, & Kueneman 1998;Spiebl, Hubner-Liebermann, & Cording 2002;Stebiaj, Tavcar, & Dernovsek 1999;Steering Committee of the Confidential Inquiry Into Homicides and Suicides by Mentally Ill People. 1996). However not all of these findings are reported in full, neither are they all subjected to statistical tests. One study did clearly demonstrate intersecting sub-group

differences for age, gender and diagnosis which were supported by statistical tests, however this study included many more suicides within a year of discharge than in-patient suicides (Barner-Rasmussen 1986;Barner-Rasmussen, Dupont, & Bille 1986). The same study showed that the main risk indicator of previous suicide attempts also varied by gender and diagnosis, with male schizophrenia sufferers more likely to commit suicide without warning. Another study contrasted inpatients suffering from depression with inpatient suicides of other diagnoses, finding that the depressed suicides were older, more likely to be living with a partner, more likely to be capable of working and less likely to have had previous admissions (Lehle 2005). Many of the findings reported in previous sections also suggest differences based on diagnosis, including the timing of suicides within the admission, and duration of illness. As a whole, these findings indicate that much more detailed work to identify particular at risk sub groups or profiles is required in future.

Method of suicide

The method of suicide displays at tendency to reflect availability. Thus hospitals near the sea have substantial numbers of deaths by drowning (Lonnqvist et al. 1974), as do those near lakes or rivers (Sundqvist-Stensman 1987); in countries with high availability of guns, these feature in inpatient suicides (Farberrow, Ganzler, Cutter, & Reynolds 1971;Sletten, Brown, Evenson, & Altman 1972); proximity to railways (Fernando & Storm 1984;Langley & Bayatti 1984); metro/underground mass transit systems (Gale, Mesnikoff, Fine, & Talbott 2007); mountains (Schlosser & Strehle-Jung 1982) and tall buildings (Dong, Ho, & Kan 2005) also provide access to means of suicide. Hanging is a substantial feature in nearly every report, and seems to be a regularly used means of suicide for those who stay on the ward or inside the hospital, as compared to those committing suicide outside the hospital (Farberrow, Ganzler, Cutter, & Reynolds 1971;King, Baldwin, Sinclair, & Campbell 2001;Read, Thomas, & Mellsop 1993;Sletten, Brown, Evenson, & Altman 1972;Sundqvist-Stensman 1987). In addition, where the hospital buildings themselves are sufficiently tall and provide access, jumping from a height is used (Farberrow, Ganzler, Cutter, & Reynolds 1971;Taiminen, Salmenpera, & Lehtinen 1992).

Relationship to other conflict events

Previous suicidal behaviour: There is robust support from case control studies for a strong association between previous suicidal behaviour and in-patient suicide, although how this variable has been disaggregated or grouped into suicidal ideas, past history of self-harm or suicide attempts, act of self-harm leading to admission, act of self harm during admission, varies by study. Every one of the 14 case control studies testing for this variable found a statistically significant result. High levels of all these features are also noted in retrospective descriptive studies, with the frequency of previous suicidal behaviour ranging from 43% (Spiebl, Hubner-Liebermann, & Cording 2002) to 75% (Coakley, Carey, & Owens 1996) in suicide cases, with a mean of 60% across studies (60% weighted). Odds ratios for previous suicidal behaviour compared to non-suicide controls are in the range (3.6-14.3), and the link seems to be stronger for suicidal behaviour in association with the current admission, as this is more likely to appear in multivariate analysis (Modestin, Zarro, & Waldvogel 1992) or display larger odds ratio (Powell, Geddes, Deeks, & Goldacre 2000), with only one

smaller study showing a greater association with self harm previous to the admission (Fernado & Storm 1984). Self-harm during admission also distinguished in-patient from post-discharge suicides in one study (King, Baldwin, Sinclair, & Campbell 2001).

Absconding: The studies that report the information (n = 31) show that a substantial minority of in-patient suicides take place after the patient has absconded from hospital. This proportion ranges from none in a rather old study (Beisser & Blanchette 1961) to 70% (Morgan & Priest 1991), with a mean rate across all studies of 27% (23% weighted). Two case control studies have tested the association of absconding with suicide, both showing it to be statistically significant, with odd ratios of 13 and 17 compared to the non-suicide controls (Dong, Ho, & Kan 2005;Hunt, Kapur, Webb, Robinson, Burns, Turnbull, Shaw, & Appleby 2007). However it is uncertain how meaningful these tests are, given that the absconding act may not be separable from the intent to commit suicide, and therefore may not be in any sense causal. Two studies described the temporal association between absconding and suicide. The first, specifically about psychiatric hospital suicides reported that 75% of suicide related absconds were immediately pre-suicide (King, Baldwin, Sinclair, & Campbell 2001). The second, reporting general hospital suicides and not otherwise included in this review, reported a similar figure of 70% (Ho & Tay 2004). One study allowed the comparison of patients who committed suicides during an abscond with those who committed suicide on the ward or whilst on agreed leave (Appleby, Shaw, Kapur, Windfuhr, Ashton, Swinson, & While 2006). Patients who committed suicide during an abscond were: more likely to suffer from schizophrenia or other delusional disorders, and more likely to have been noncompliant in the previous month. In comparison, those committing suicide on the ward were: less likely to be living alone; and more likely to have symptoms at last contact, be suffering from a personality disorder, or be detained under mental health legislation.

Violence and aggression: Evidence on this issue is sparse, with one case control study showing no link to anger or irritability (Powell, Geddes, Deeks, & Goldacre 2000), and another showing that aggression towards objects differentiated in-patient from post-discharge suicides (King, Baldwin, Sinclair, & Campbell 2001).

Relationship to containment methods

Special observation: Only some studies provide descriptive information on the use of special observation *at the time* of suicide. The proportions of suicides on intermittent observation ranged from 20% (Appleby, Shaw, Kapur, Windfuhr, Ashton, Swinson, & While 2006) to 62% (Busch, Fawcett, & Jacobs 2003), and constant special observation ranged from 2% (Powell, Geddes, Deeks, & Goldacre 2000) to 9% (Busch, Fawcett, & Jacobs 2003). Information from some studies could not be used as the terms 'special observation' or 'suicide precautions' were not defined. One German study reported that 22% of suicides were on 'intensive guarding' at the time (intensive uberwachung), but this is not defined. Base rates of these containment measures in comparable populations or in the control cases mostly not declared, with only one study testing the difference between cases and controls, finding no difference, perhaps because numbers were very small (Powell, Geddes, Deeks, & Goldacre 2000). One case control study does show that constant special observation at any time during the

admission was associated with suicide (Sharma, Persad, & Kueneman 1998), with 43% of suicides being in this category. In addition, one single case study reports a suicide following cessation of 22 days of constant special observation and 12 days of intermittent observation (Pauker & Cooper 1990), suggesting that the withdrawal of supervision triggered the event. One detailed case study of a suicide cluster at one hospital (Kobler & Stotland 1964) suggests that increased containment (including observation) coupled with staff anxiety and decreased patient confidence, led to some patient suicides. As in any case it should be expected that patients at high risk would be more likely to be on special observation at some stage of their admission, little can be deduced from these studies. It might seem strange that patients on constant special observation can successfully commit suicide, but one study documents how this occurs (Gale, Mesnikoff, Fine, & Talbott 2007), reporting that such failures occur when staff informally cease observation to undertake other activities.

Seclusion: One older study from Finland reported that 2% of suicides were in seclusion at the time of death (Achte, Stenback, & Teravainen 1966). A similarly rather old study from the USA found 10% of suicides occurred during seclusion (Rotov 1970), and an even older study from the same country a rate of 52% of suicides occurring in seclusion (Beisser & Blanchette 1961).

The locked door: Several studies refer to whether suicides occurred with in-patients who were on locked or open wards. All descriptive studies reporting this item showed that suicides were prevalent on locked as well as open wards (Armbruster 1986;Deisenhammer, DeCol, Honeder, & Hinterhuber 2000;Fujimori & Sakaguchi 1986;Koester & Engels 1979;Lange 1966;Lehle 2005;Maier 1981;Niskanen 1974;Ritzel 1974). Although no statistical tests occur in these studies, the authors declare in some cases (Deisenhammer, DeCol, Honeder, & Hinterhuber 2000;Niskanen 1974) that the proportions of suicides on either type of ward reflect the proportions of admissions to both destinations. However while one of the studies showed there were just as many suicides following absconds from the locked wards as the open ones (Niskanen 1974), the other reported that none of the suicides on the locked wards followed an abscond (Deisenhammer, DeCol, Honeder, & Hinterhuber 2000). One further study reports that of eight suicides occurring to patients on locked wards half were after the patient had absconding (Armbruster 1986), making clear that the locked door can be an imperfect barrier. It is therefore unclear whether locking the door makes no difference to the rate of abscond suicides, or whether it simply increases the proportion of suicides occurring on the ward itself. A Swiss longitudinal study covering one hospital from 1900-1977 (Ernst 1979) reported a rise in suicide rates, and credited this to the co-occurring opening of wards, showing that the proportion of the total inpatients suicides occurring inside the hospital declined over the period. However in a follow up to this study, the author calculated a 'Liberalising Quotient' and related it to inpatient suicide rates 1960-80, only to find that patient freedoms declined in the final five years whilst suicides tripled (Ernst, Moser, & Ernst 1980). In addition several other European studies report a similar rising trend in inpatient suicide as detailed above, for which there are many possible explanations. In a natural experiment, one psychiatric hospital opened the doors of the wards and found no increase in suicide comparing the five years before with the five years after (Lange 1966), although numbers were small (13 suicides in total). One German case control study of 64 suicides and 64 control patients statistically tested this item, and found no significant difference (Wolfersdorf, Klinkisch, Franke, Keller, Wurst, &

Dobmeier 2003). Open ward patients were no more likely to commit suicide than locked ward patients. The preponderance of evidence is therefore that locking the ward door has no effect on inpatient suicide rates, and ward doors can safely be left open.

Meta-analysis

There was enough demographic and diagnostic data on inpatient suicides in 72 papers to extract and subject to further quantitative analysis. However it should be noted that there was a large amount of missing data, as not every paper provided information on every item. Taking the results from each paper as a single case, a correlation matrix was constructed. The proportion living alone, unmarried and unemployed were significantly associated with each other. The proportion unmarried was also significantly positively associated with the proportion previously admitted. However the variable showing the widest range of association to others was the proportion of suicides suffering from an affective disorder. These results are shown in Table 7.

Table 7. Spearman correlations across reported suicide samples

	Proportion with schizophrenia			Proportion with affective disorder		
	r	p	N	r	p	N
Proportion dying in hospital	-0.202	0.344	24	0.351	0.167	17
Proportion dying on leave	0.520	0.069	13	-0.683	0.042	9
Proportion dying while absconded	-0.221	0.336	21	0.137	0.589	18
Proportion compulsorily detained	0.646	0.017	13	-0.772	0.003	12
Median age	-0.861	0.006	8	0.756	0.018	9
Proportion male	0.128	0.413	43	-0.136	0.416	38
Proportion unemployed	-0.121	0.680	14	0.193	0.528	13
Proportion living alone	0.168	0.666	9	-0.108	0.818	7
Proportion married	-0.077	0.728	23	0.335	0.148	20
Proportion with previous admissions	0.149	0.628	13	-0.284	0.372	12
Proportion with self-harm history	-0.174	0.589	12	0.677	0.031	10

These findings suggest that patients with schizophrenia are more likely to suicide whilst on leave, and patients with affective disorder less likely to do so. As agreed leave is more likely to be given later in an admission, this tallies with findings that patients with affective disorder are at greater risk earlier in their admission. In addition it would appear that cases with schizophrenia are more likely to be compulsorily detained, whereas cases with affective disorder are less likely to be so. Thus the varying results from case control studies for this variable are probably explicable in terms of the proportions of these two diagnoses in the study samples. Furthermore cases with schizophrenia seem likely to be significantly younger, while patients with affective disorder are significantly older. Again here, countervailing associations across different diagnoses are likely to have confounded the generic case control studies. Finally, it would appear that a previous history of self-harm may be more frequent amongst cases with affective disorder.

Discussion

Summary: Reported rates of inpatient suicide varied by all three commonly used denominators – admissions, population and total number of suicides – indicating that such figures are influenced by social and service organisation factors. Rates in some countries have risen during the latter half of the 20th Century. The reasons for this are

unknown, but suicide rates are strongly associated with admission rates, which have risen over the same period. Clusters of suicides have been reported, but seem to be very rare and do not appear to make a substantial contribution to overall rates. Roughly 40% of suicides take place on the ward, 40% on agreed leave, and 20% whilst the patient is absent without permission. Locking the ward door does not appear to reduce suicide rates, but may change the location of the suicidal act. Methods of suicide reflect availability, but hanging seems to be a regular feature for those committing suicide on the ward. Reduced staff supervision and support (leave, failure of constant observation, raised risk in evenings/nights) appears to be associated with suicide. There is no convincing evidence that negative staff attitudes are associated with suicide. There are few features that in general consistently distinguish inpatients who commit suicide from others. They are the same age, gender, marital status, employment status, ethnicity, religion, are no more likely to live alone or to be aggressive to others, use drugs and alcohol to the same degree, have the same educational attainment level and forensic history. Whether compulsory detention is associated with suicide seems to depend on the legal and psychiatric system in the country concerned. Both schizophrenia and affective disorder are associated with suicide, but these are the two most common diagnoses amongst those admitted as inpatients. Although both diagnostic groups are at increased risk early in the admission, this is more so for people with affective disorder, whilst those with schizophrenia continue to be at risk over longer periods of time. Difficulties with family relationships may be important, and are particularly related to patients with schizophrenia and for those taking their lives whilst on agreed leave. Evidence suggest that diagnosis, gender and age might be associated with differing risk factors and profiles. The most reliable indicators differentiating suicides from non suicides are previous self-harm and depressive symptoms.

Changes in suicide rates over time: The association of inpatient suicide rates with admission rates is intriguing, especially given the matching of both rising and falling trends, and across many different datasets from different countries. Coupled with this, old and new studies have found a connection between admissions and self-harm/suicide (Bowers et al. 2005a;Bowers et al. 2007). High admission rates may undermine sustained bonds of support between people, accentuating alienation and prompting more suicides, in a process akin to that described by Durkheim, and suggested by one author in 1968 (Kahne 1968b). Studies of suicide clusters also raise the idea that staff turnover and turmoil might have a similar affect on social bonds and patient support, although there is less hard evidence for this.

Sample heterogeneity: The most consistent finding from this review is of inconsistency between the findings of different studies, even between those conducted within the same country and psychiatric system. This could mean that the features of in-patient suicides have been changing all the time within a psychiatric that has been in transition towards community care. If this is so, it might never be possible to identify unique and enduring valid features of in-patient suicides, as the nature of the inpatient population continuously changes. Other possibilities are that the use of uncertain as well as certain cases of suicide, or the inclusion in some studies of patients in post-discharge period, has led to too much dissimilarity between the samples. However only three of the case control studies included post-discharge patients, all were small, and one contributed nothing to the above review (Fernado & Storm 1984;Goldney, Positano, Spence, & Rosenman 1985;Medlicott & Medlicott

1969). Alternatively, in-patient suicides may not be a homogenous group, a supposition which is supported by several studies. Different subgroups are possible between different diagnostic groups or within them, or might intersect with other demographic features. For example there may be two groups, the first being younger, male, unemployed, suffering from schizophrenia and single, and the second being older, female, divorced/separated and suffering from affective disorder. There is also indicative evidence that in-patient suicide by alcohol and drug dependent patients may differ from others. Certain life and adjustment dilemmas might be more salient for certain diagnoses, genders, ages etc., and thus underlie the observed heterogeneity. If so, the variation in findings between studies may result from the differential presence of dissimilar groups within the suicide samples. A number of contradictory findings may become consistent if differing groups are examined separately.

Suicide clusters: Evidence for the existence of such clusters is poor, and they seem to be extremely rare. There is much better evidence for clustering of suicides in the community, with one large study reporting that imitative effects account for 10% of suicides by current and recent patients (McKenzie et al. 2005), suggesting that hospital based clusters may certainly be a possibility. The best supported mechanism is that of one patient copying the suicidal act of another. The first act my thus introduce into a vulnerable persons mind the possibility of suicide, making it more real, of might suggest the means by which the act could be completed, therefore easing access to the means. A person seems to be more likely to be vulnerable to acting upon a strong suicidal impulse if someone else has gone before and provided the idea on how to do so. As inpatient suicides are so infrequent, the effect might be stronger and more easily seen if serious attempts included in future analyses, as some studies have already done (Rissmiller & Rissmiller 1990).

Suicide causation, absconding and leave: Clearly a substantial number of patients plan their suicide and then abscond in order to do so. However a number also do not immediately commit suicide, suggesting that these are ambivalent or impulsive acts that are stimulated by features of the out-of-hospital environment, or enabled to be enacted because of the absence of staff support and supervision at a critical moment. As we have only one study that gives timing information of absconds in relation to suicide, we cannot put a reliable estimate on the relative proportions of these two groups. While those who leave with intent and a plan may not respond to nursing interventions that are known to reduce absconding (Bowers, Simpson, & Alexander 2005;Bowers, Alexander, & Gaskell 2003), the impulsive group might do so, lending support to the idea that such an intervention can reduce the number of suicides. We have no information at all about intent in relation to agreed leave. Patients may plan and wait for their opportunity to be given leave, or it may be an impulsive act that comes to fruition because of the absence of a supportive and containing environment (or the presence of hostile and conflict ridden one). What information we do have suggests that it is the presence of emotional conflicts with the family that triggers suicide during leave. Additionally, the absence of activity and social interaction, which are known to be protective factors, might make patients who are isolated from the hospital more vulnerable (Bowers, Whittington, Nolan, Parkin, Curtis, Bhui, Hackney, Allan, Simpson, & Flood 2007;Duberstein et al. 2004). More research is clearly required into planning and intent by inpatients, and their precise psychological state in relation to the suicidal act. Such data could be obtained from the survivors of serious attempted suicide. Information should also be collected (and analysed) on

differences between those inpatients who suicide on the ward, on agreed leave, or whilst absconded. While one study allowed such a secondary analysis to be undertaken based on the published figures (Appleby, Shaw, Kapur, Windfuhr, Ashton, Swinson, & While 2006), stronger statistical approaches could be used on the raw data.

Methodological lessons for future research: It might be thought that given the number of studies already conducted, that retrospective descriptive studies had already been mined of their full potential. This is not the case. Such studies could be improved by the collection of larger samples, more comprehensive information with better definitions of variables and standardised approaches to the extraction of primary and secondary diagnoses from records, for example. Exclusion of post-discharge studies from samples would also be an improvement, as several studies show significant differences between these and in-patient suicides (King, Baldwin, Sinclair, & Campbell 2001;Sundqvist-Stensman 1987). However the largest single improvement would be for such studies to run exploratory sub-group analyses and contrasts (between genders, diagnoses, age groups, drug/alcohol use, location of suicide, etc.) in order to ascertain reliably identifiable dissimilar groups. Such work may considerably improve the capacity for prediction and the scope for titrating intervention to patient. Case control studies could make valuable improvements by incorporating subgroup analyses. One has done this (Roy & Draper 1995), and others have pursued work on suicides by patients with specific diagnoses (Modestin, Zarro, & Waldvogel 1992). Much more of this work is required for progress to be made. Longitudinal analyses have so far been rudimentary, with little more than trend analysis so far conducted, and no exploration of the capacity for utilising different time segments, such as weeks or months rather than years. This would allow the testing of different theories and potentially more statistically powerful analyses. Far more is possible with modern longitudinal statistical techniques, via the decomposition of time series data into trends, seasonality, and cycles, coupled with a more sophisticated statistical approach. Such efforts should also examine sub-group differences by themselves and in relation to historical change in in-patient psychiatry, for example the change in the balance of genders amongst in-patients (Prior & Hayes 2001). A beginning in this direction has been made, but only in a study where inpatients were outweighed fourfold by outpatients within a year of discharge (Barner-Rasmussen, Dupont, & Bille 1986). Studies could also usefully conduct further tests for random order to assess for the presence of a contagion effect (Anon 1977;McKenzie, Landau, Kapur, Meehan, Robinson, Bickley, Parson, & Appleby 2005).

Clinical lessons for practitioners: For the UK, the frequency figures show that an average acute ward will experience an in-patient suicide once every 3-4 years. Thus, in the experience of clinical staff, this will be a rare event that is exceedingly difficult to predict, especially given that high numbers of patients are admitted with the only robust and consistently known risk factors: a history of self-harm and depressive symptoms. The findings of this review suggest that clinical staff should give as much attention to suicide risk in cases of schizophrenia as they do with affective disorder, which is more commonly known and logically associated with suicide. The early stages of an admission appear to be particularly risky, so it may be wise to place all new in-patients on a minimum level of intermittent observation, an intervention known to be associated with reduced self-harm (Bowers, Whittington, Nolan, Parkin,

Curtis, Bhui, Hackney, Allan, Simpson, & Flood 2007). However the dangers of chronicity and despair should not be ignored either, and longer staying patients should be repeatedly reassessed for their suicide risk.

Nursing psychosocial interventions to reduce absconding rates (Bowers, Simpson, & Alexander 2005) may lower risks through reducing the numbers of suicidal patients left unsupported and vulnerable to impulsive acts during the abscond, or due to their exposure to emotional conflicts at home.

Locking the door does not appear to reduce risks, and there are indications that while it reduces absconding, it increases feelings of stigmatisation, feelings of depression and decreases perceived staff support (Bowers, Whittington, Nolan, Parkin, Curtis, Bhui, Hackney, Allan, Simpson, & Flood 2007;Bowers et al. 2008). When risks are judged to be extremely high, for example when a patient is expressing credible suicidal ideation and/or has made a very recent attempt, constant special observation may be utilised. When on this level of observation the patient must never be left, and nursing staff must not informally adjust the intensity of observation, as described in some studies (Aidroos 1986).

The association of suicide with leave, absconding, and evenings/nights all suggest that reduced staff supervision increases risk. Staff therefore need to maintain vigilance, especially at times of reduced staffing (nights) reduced staff availability (handovers), of isolated unsupervised areas of the ward (bathrooms, toilets, single rooms); and make plentiful use of intermittent observation (Bowers, Whittington, Nolan, Parkin, Curtis, Bhui, Hackney, Allan, Simpson, & Flood 2007).

The fact that people abscond to commit suicide, or do so on leave, suggests that access to the means and absence of supportive supervision are critical factors in suicide prevention. We should therefore continue to take action to 'suicide-proof' wards through the removal of ligature points, banned items, etc. with due attention to local traditions and recently successfully used suicide methods.

Agreed leave should only be given with caution to potentially suicidal patients, and perhaps avoided where there are known family conflicts, as well as when the patient lives alone and will be unsupervised. It should not be assumed that giving leave when there is a relative in the home is necessarily always safer because of the provision of supervision and support, although this may apply where that supervision and support is truly available and conflict absent. Instead the findings point to the need to engage with the whole family for therapy and to recruit support for the patient prior to leave being given and probably also prior to discharge. This would be a substantive change in the models of care currently operated by acute inpatient services, where relatives are often kept at a distance and struggle to link up to the professionals (Simpson 2008). In addition, there may be ways for the ward team to support patients while they are on leave outside of hospital. Something as small as a phone call from the ward staff expressing concern and support may be enough to make a significant difference to some patients.

Reflection: The studies reviewed cover the deaths of nearly 15,000 people who were receiving in-patient care. This review is dedicated to them, so many and so often unremembered and unacknowledged, each and every one a tragedy for the person concerned and for those they left behind.

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