Sudden death in patients with serious mental illness

Erik Monasterio, Andrew McKeen, Vimu Sinhalage Christopher Frampton, Roger Mulder

ABSTRACT

AIM: Sudden death is used to define a death under suspicious circumstances, where there is no clear indication of existing medical illness (natural cause) that accounts for the death or clear indication for the cause of death. This includes all deaths from suicide, unintentional poisoning, drowning, falls and violence. Sudden death contributes to the increased mortality in people with serious mental illness (premature mortality) but is far less frequently studied and understood. This study analyses data of all sudden deaths of patients who had been under the care of the Canterbury District Health Board’s Specialist Mental Health Service, New Zealand’s second-largest population region. The study identifies key sociodemographic, diagnostic, legal and causative factors in the study population. This study aims to identify targeted interventions to mitigate premature mortality in this population.

METHOD: Data was obtained from the clinical files and the coroner’s findings for all sudden death patients with established contact with Specialist Mental Health Services in the Canterbury region of New Zealand, between 2005 and 2009.

RESULTS: A total of 313 patients were identified. The median age at the time of death was 42 years (IQ Range 32.5–53 years). Of these, 65% (n=203) were male. Seventy-six percent (n=239) were of European descent and 9% Māori (n=29); 68% (n=280) were under care at the time of their death and 15% (n=32) were under the Mental Health Act. The sudden death rate was 0.36% for those under voluntary care and 0.7% for those under compulsory care. The most common primary diagnoses were alcohol or other drug abuse (29%); depression (25%); psychotic disorders (18%); BPAD (9%) and personality disorder (5%). The most common cause of death was suicide (51.8%) followed by motor vehicle crashes and falls, (23.3%) medical causes (17.6%) and homicide (1.3%). Of those that died by suicide, 75% were male. Hanging was the most common method (48%) followed by carbon monoxide poisoning (9.3%); medication overdose (5.8%) and falls from a height (3.5%).

CONCLUSIONS: The most common cause of sudden death was suicide, which was overwhelmingly the leading cause of sudden death in patients discharged or lost to follow up. The most potent predisposing factor appeared to be drug and alcohol problems. Mental health services should therefore advocate for comprehensive and evidence-based alcohol and drug policies, including access and availability to treatment programmes.

People who experience serious mental illnesses (SMI) are known to have poor health status and significantly premature mortality compared to the general population. Cunningham et al examined premature mortality rates and causes of death for adults using psychiatric services in New Zealand from 2003 to 2010. They found that adults who use secondary mental health services had more than double the mortality rate of the total population, with an increased risk of death from natural causes such cardiovascular disease, cancer, and from external causes (suicide and accidents). This excess mortality in all age groups and decreased life expectancy for those suffering from SMI (schizophrenia and related disorders, bipolar disorder, depressive disorder, neurotic disorder and substance use disorder) has been widely and consistently documented for several decades. Sudden or unexpected death is used to define a death under suspicious circumstances, where there is no clear indication of existing medical illness (natural cause) that accounts for the death or clear indication for the cause of death. This includes all deaths from suicide, unintentional poisoning,
drowning, falls and violence. The Coroner has a statutory responsibility to investigate all such deaths.

Sudden death contributes to but does not entirely account for the increased mortality in people with SMI. However, sudden death is far less frequently studied and understood than premature mortality in SMI. A matching survey linking deaths registered to the State Coroner of Victoria and a database of all patients who had received care from public sector mental health services in Victoria in 1995 found that sudden deaths were five times higher in people with histories of psychiatric contact. Those who had prior contact with mental health services were on average 11 years younger at the time of death than those without a record of prior psychiatric contact and who did not suffer from organic disorders. The sudden deaths in those with prior contact with mental health services were most commonly due to natural causes, suicides and accidents.

A more recent study of patients receiving inpatient and community care from a large psychiatric hospital in New York, between 1984 and 2009, focused solely on sudden death from natural causes and found that the incidence of these deaths had increased greatly in the first decade of the 21st Century. The cause of death was only determined in 48% of cases, and was mostly due to acute coronary syndromes.

The Mental Health Service of the Canterbury District Health Board (MHSCDHB) provides secondary and tertiary psychiatric care, in a variety of community and inpatient facilities, to a population of approximately 540,000. This population ranks second in size out of the 16 regions in New Zealand and accounts for 12.7% of the national population.

As part of its routine data collection on adverse incidents, the MHSCDHB collects information in relation to all sudden or unexpected deaths (sudden death register) that occur for all current and previous patients under the care of these services. All such deaths are subject to specialist review and involve an inquest from the Coroner’s Office to determine the cause of death.

The purpose of this study is to examine clinical information and the Coroner’s findings for deceased patients from the sudden death register. Linking information across these two different data sets provides more detailed information on sudden death in SMI than can be obtained from examining the data sets individually. It adds to the very limited pool of research into the characteristics of sudden deaths in patients with SMI, which can assist to identify targeted interventions to mitigate premature mortality from sudden death in this population.

Consistent with national and international findings on premature and sudden death, the authors hypothesised that natural causes, particularly from cardiovascular disease, would be the most common cause for sudden death in patients with SMI.

As there have been no publications in this area in New Zealand, the study will assist in determining to what extent sudden death characteristics are the same as those for premature mortality.

### Methods

#### Sources of data

This study analysed data from the MHSCDHB sudden death register between 1 January 2005 and 31 December 2009. As described above, the Coronial Services of New Zealand defines sudden death to be a death under suspicious circumstances, where there is no clear indication of existing medical illness (natural cause) that accounts for the death or clear indication for the cause of death.

As the Coroner has a statutory responsibility to investigate all such deaths, cases identified by name, age and gender are referred to the Canterbury Regional Mental Health Service to determine whether contact with specialist mental health services has occurred. This information is cross-referenced to the electronic database for all patients’ contacts with the MHSCDHB. All those identified to have had past or present contact with MHSCDHB are included in the sudden death register, and without exception were included in the study. As the Coroner has a statutory responsibility to investigate these deaths, all sudden deaths are likely to have been identified by this process.

In addition, the Coronial and clinical files for each patient in the sudden death register, identified by their National Health Index (NHI) number, were manually reviewed by the researchers. All the data
was anonymised. Ethics approval by the Upper South Regional Ethics Committee was obtained (ref: URA/09/07/EXP).

Variables

Sociodemographic variables
Age, sex and ethnicity data. Ethnicity was grouped into European (including New Zealand European), New Zealand Māori, Pacific, Asian and other.

Cause of death
Suicide, medical, accidental, homicide and ‘unable to be determined’ (as determined by coronial verdict).

Length of time elapsed since last contact with MHSCDHB and time of death
Reported in months for all subjects.

Mental Health Act Status
Voluntary and involuntary status and whether under the care of the MHSCDHB at the time of death. Involuntary status included those subject to assessment or a community or an inpatient treatment order of the Mental Health (Assessment and treatment) Act 1992 [MHA].

Diagnosis
Extracted from the clinical files and/or Coroner’s reports, which utilise ICD 9 or ICD10 coding.

Specialist mental healthcare provider
If receiving care from MHSCDHB at the time of death, whether inpatient or outpatient, and which service provided care.

Identified stressor before death
Relationship stress, other family stress, criminal charges, death of a loved one, drug/alcohol withdrawal, financial stress, incarceration or recent prison release, major physical illness diagnosis, occupational problem and other (determined from coronial files and/or MHSCDHB clinical files).

Results
The data sources for determining the appropriate denominator (to calculate the sudden death rate) are limited, therefore the mean number of 11,054 patients/year under the care of the MHSCDHB between 2005 and 2009 has been adopted for this. This includes a number of people under care over more

Table 1: Sociodemographic, diagnosis and mental health service variables.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Median age (interquartile range) (years)</td>
<td>42 (32.5–53)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>203 (64.9%)</td>
</tr>
<tr>
<td>Female</td>
<td>110 (35.1%)</td>
</tr>
<tr>
<td>Ethnic origin</td>
<td></td>
</tr>
<tr>
<td>NZ and other European</td>
<td>239 (76.4%)</td>
</tr>
<tr>
<td>Māori</td>
<td>29 (9.3%)</td>
</tr>
<tr>
<td>Pacific</td>
<td>6 (1.9%)</td>
</tr>
<tr>
<td>Asian</td>
<td>6 (1.9%)</td>
</tr>
<tr>
<td>Not recorded</td>
<td>33 (10.5%)</td>
</tr>
<tr>
<td>Mental Health Act Status at time of death</td>
<td></td>
</tr>
<tr>
<td>Informal</td>
<td>280 (89.5%)</td>
</tr>
<tr>
<td>Involuntary</td>
<td>32 (10.2%)</td>
</tr>
<tr>
<td>Primary diagnosis</td>
<td></td>
</tr>
<tr>
<td>Alcohol/substance abuse</td>
<td>82 (26.2%)</td>
</tr>
<tr>
<td>Depressive disorder</td>
<td>72 (23%)</td>
</tr>
<tr>
<td>Psychotic disorder</td>
<td>51 (16.3%)</td>
</tr>
<tr>
<td>Bipolar affective disorder</td>
<td>26 (8.3%)</td>
</tr>
<tr>
<td>Personality disorder</td>
<td>14 (4.5%)</td>
</tr>
<tr>
<td>Adjustment disorder</td>
<td>13 (4.2%)</td>
</tr>
<tr>
<td>Anxiety disorder</td>
<td>7 (2.2%)</td>
</tr>
<tr>
<td>Dementia</td>
<td>5 (1.6%)</td>
</tr>
<tr>
<td>Other*</td>
<td>13 (4.2%)</td>
</tr>
<tr>
<td>Not recorded on data sets</td>
<td>30 (9.5%)</td>
</tr>
<tr>
<td>Primary Mental Health Service</td>
<td></td>
</tr>
<tr>
<td>Community Drug and Alcohol Service</td>
<td>65 (30%)</td>
</tr>
<tr>
<td>Psychiatric Emergency Service</td>
<td>38 (18%)</td>
</tr>
<tr>
<td>Adult Inpatient Service</td>
<td>38 (18%)</td>
</tr>
<tr>
<td>Adult Community Service</td>
<td>35 (16%)</td>
</tr>
<tr>
<td>Adult Specialist Services</td>
<td>15 (7%)</td>
</tr>
<tr>
<td>Psychiatric Services for the Elderly</td>
<td>11 (5%)</td>
</tr>
<tr>
<td>Forensic Service</td>
<td>7 (3%)</td>
</tr>
<tr>
<td>Child, Youth Family Service</td>
<td>5 (2%)</td>
</tr>
<tr>
<td>Not under care of services</td>
<td>99 (31.6%)</td>
</tr>
</tbody>
</table>

*Intellectual Disability, PTSD, Eating Disorder, Conduct Disorder, Paraphilia, Alcoholic Hepatitis, ADHD, Parkinson’s.
than a single year period. Of those, 52% were male; 81% were New Zealand and other European, 12% were Māori, 1.6% Pacific and 1.7% were not coded; 935 patients/year received treatment under the MHA (8.5%).

A total of 313 patients were identified on the sudden death register during the five-year study period. These patient characteristics are discussed in Table 1.

**Demographic variables**

The mean age at time of sudden death was 43.6 years and the median was 42 years old (interquartile range 32.5–53 years old); 203 (65%) were male and 110 (35%) were female; 239 (76%) were New Zealand and other European, 29 (9%) Māori, 6 (2%) were Pacific, 6 (2%) were Asian and 33 (11%) had no ethnicity recorded.

**Mental Health Act Status**

Two hundred and fourteen (68%) subjects were receiving care from MHSCDHB at the time of their sudden death, 32 (15%) of those under the MHA and 99 (46%) were also under the care of two specialist services. Fifty (16%) were inpatients at the time of their deaths. Ninety-nine (32%) were not under specialist care. Therefore the sudden death rate from 2005–2009 was 0.36% for those under voluntary care and 0.7% for those under the MHA.

**Length of care**

The total length of time that MHSCDHB provided (in- and out-patient) care was available for 284 (90.7%) patients. The mean time in care was 1,346 days (median = 565 days, interquartile range = 107–2,105 days). The mean number of ‘cases’ was 7.8 (s.d. = 10.5), (median = 5, interquartile range = 2 to 10). Each ‘case’ is a separate admission and discharge hospital or community care episode. There were 24 patients (8%) who had total length of stay (LOS) of 0 or 1, which means that they had no specialist follow-up following an initial assessment.

**Contact with MHS**

The time between the last contact with mental health services and sudden death was available for 258 (82%) patients. The mean was 13.3 months but the median was one month (interquartile range 0 to 12 months). Sixty-five percent had had contact with MHSCDHB within three months of their death.

**Cause of death**

The cause of sudden death most commonly recorded was suicide (163 patients, 52%) or 0.3% of patients under specialist care. This was followed by accidents, predominantly from motor vehicle crashes and falls (73 patients, 23.3%), medical causes from predominantly cardiovascular and respiratory diagnoses (55 patients, 17.6%) and homicide (4 patients, 1.3%). The cause of death was not able to be determined in 18 patients (5.8%) and in most of these the Coroner was unable to determine whether the death was accidental or from suicide.

Suicide was by far the most common cause of sudden death (87%) for patients discharged from MHSCDHB. A total of 112 (69%) males and 51 (31%) females died by suicide; 26 (16%) were under inpatient care. The mean age at time of sudden death was 43.6 years and the median was 42 years old (interquartile range 32.5–53 years old); 203 (65%) were male and 110 (35%) were female; 239 (76%) were New Zealand and other European, 29 (9%) Māori, 6 (2%) were Pacific, 6 (2%) were Asian and 33 (11%) had no ethnicity recorded.

**Figure 1:** Time to death from last contact with Mental Health Services (months).
care and 86 (53%) of those were not under specialist care, at the time of death.

Hanging was the most common method of suicide (77 patients, 48%): 58 males (75%) and 19 females (25%) died by hanging. Other means of suicide included carbon monoxide poisoning (29 patients, 9.3%), medication overdose (including both over the counter and prescribed medications) (18 patients, 5.8%) and falls from a height (11 patients, 3.5%). Less common methods included poisoning (5 patients, 3%); cutting throat and/or wrists (4 patients, 2.4%); suffocation (4 patients, 2.5%); recreational drug overdose (2 patients, 1.2%); electrocution (2 patients, 1.2%); drowning (2 patients, 1.2%); car crashes (2 patients, 1.2%); trains (2 patients, 1.2%); gunshot wounds (1 patient, 0.6%); and not clearly determined from multiple causes (3 patients, 0.2%) (Table 2).

The Coroner’s Office has only provided suicide statistics since 2007/08, and from this point to 2009/10 there were a total of 176 deaths for the Canterbury DHB Region. During the period 2007–2009 there were 100 suicide deaths identified in the sudden death register, indicating that a very high proportion of these (approximately 57%) of all suicides in the Canterbury Region had had contact with specialist mental health services.

Diagnoses

The primary diagnosis was available for 283 (90.4%) of the 313 patients. Alcohol and other drug abuse was the primary diagnosis for 82 (29%), depression for 72 (25%), psychotic disorder for 51 (18%); bipolar affective disorder for 26 (9%), personality disorder for 14 (5%), adjustment disorder for 13 (4.6%), anxiety disorder for 7 (2.5%), dementia for 5 (1.8%), intellectual disability for 4 (1.4%), PTSD for 3 (1%), eating disorder for 2 (0.7%) and conduct disorder, paraphilia, ADHD and Parkinson’s disease for one patient each respectively.

For those who died by suicide the predominant primary diagnoses were: depression for 55 (34%), alcohol and other drug abuse for 32 (20%), psychotic disorder for 19 (12%); bipolar affective disorder for 11 (7%); adjustment disorder for 11 (7%) personality disorder for 8 (5%); anxiety for 6 (3.5%), PTSD for 3 (2%), no diagnosis for 14 (9%) (Table 2).

### Table 2: Causes of death and diagnoses in suicides.

<table>
<thead>
<tr>
<th>Cause of suicide death</th>
<th>Number of people (n=163)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hanging</td>
<td>77 (47.2%)</td>
</tr>
<tr>
<td>Carbon monoxide poisoning</td>
<td>29 (17.8%)</td>
</tr>
<tr>
<td>Medication overdose</td>
<td>18 (11.0%)</td>
</tr>
<tr>
<td>Fall</td>
<td>11 (6.7%)</td>
</tr>
<tr>
<td>Other poisoning</td>
<td>5 (3.1%)</td>
</tr>
<tr>
<td>Other*</td>
<td>19 (12%)</td>
</tr>
<tr>
<td>Not recorded</td>
<td>4 (2.5%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Diagnosis for suicides</th>
<th>Number of people (n=163)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depressive disorder</td>
<td>55 (34%)</td>
</tr>
<tr>
<td>Alcohol/substance abuse</td>
<td>32 (20%)</td>
</tr>
<tr>
<td>Psychotic disorder</td>
<td>19 (12%)</td>
</tr>
<tr>
<td>No diagnosis</td>
<td>14 (8.6%)</td>
</tr>
<tr>
<td>Adjustment disorder</td>
<td>11 (7%)</td>
</tr>
<tr>
<td>Bipolar affective disorder</td>
<td>11 (7%)</td>
</tr>
<tr>
<td>Personality disorder</td>
<td>8 (5%)</td>
</tr>
<tr>
<td>Anxiety disorder</td>
<td>6 (3.5%)</td>
</tr>
<tr>
<td>Other**</td>
<td>7 (4.5%)</td>
</tr>
</tbody>
</table>

*Cut throat/wrist (2.5%), suffocation (2.5%), electrocution (1%), recreational drug overdose (1%), impact by train (1%), drowning (1%), car crash (1%), gunshot (0.5%).

**PTSD, Paraphilia, ADHD, Parkinson’s Disease, Dementia.

Identified stress before death

Eighty-four (52%) of patients who had sudden death by suicide had an apparent stressful event recorded at the last contact with the service provider. The most common were intimate relationship problems for 33 (39%), incarceration or recent prison release for 18 (21%), financial stress for 9 (11%), death of a loved one for 8 (10%) and work problems for 6 (7%) and ‘other stressors’ for 20 (15%) of patients.

Specialist mental health care provider

The primary mental health teams for patients who were under care were Alcohol and Drug Services for 65 (30%) of patients, Psychiatric Emergency Service for 38 (18%),
Adult Inpatient Service for 38 (18%), Adult Community Service for 35 (16%), Adult Specialist Services for 15 (7%), Psychiatric Services for the Elderly for 11 (5%), Forensic Service for 7 (3%) and Child, Youth Family Service for 5 (2%) patient respectively. There were a further 99 patients (31.6%) that were not under care at the time of their death.

There were 99 patients who were also under an additional mental health service at the time of their death. The most common additional services were the Acute Inpatient Service for 25 (25%) patients, Psychiatric Emergency Service for 23 (23%), Adult Community Services for 16 (16%), and Forensic Community Team for 12 (12%).

**Discussion**

**Main findings**

This study examines the sudden death characteristics of patients who previously received care from New Zealand's second largest specialist mental health provider from 2005–2009. Consistent with our clinical experience of treating patients with SMI, over 90% of cases identified in the study received multiple episodes of community and hospital care over several years. The findings are therefore not unduly influenced by patients who had only a single contact with MHSCDHB. The Coronial Service of New Zealand does not have statistical data on the prevalence and causes of sudden death in the general population, to compare with the study population (Information Adviser, Specialist Courts, Ministry of Justice, 2017, personal communication). However, it is clear that the rate of sudden death in those with prior contact with MHSCDHB is significantly elevated, particularly from suicide and within three months of the last clinical contact.

The study findings do not support the authors’ hypothesis that natural causes were the most common cause for sudden deaths in patients with SMI with a history of contact with MHSCDHB. These findings are also not consistent with that of a similar study in Victoria, Australia in 1995, which found that sudden deaths in those with prior contact with mental health services were most commonly due to natural causes, then suicides and accidents. It is difficult to account for this. It is possible that there may be a difference in the Coronial process between Victoria and New Zealand, and that the threshold to investigate sudden deaths in patients with known histories of medical problems (which is likely to account for sudden death) is higher in New Zealand. This contention is supported by the finding of a previous study which found that natural causes accounted for the majority of premature deaths among patients with SMI in New Zealand.2

The findings of this study with regard to suicide are probably the most relevant and generalisable. There is a very high likelihood that all suicides have been captured by the study, as there is a statutory requirement that all suspected suicides are reported to the Coroner’s Office and there is a robust process to identify these with the MHSCDHB sudden death register. Suicide was the leading cause of sudden death for patients in the study and these suicides, by patients who had received specialist mental health care, appear to account for close to 60% of all suicides in the Canterbury region between 2007 and 2009. This contrasts with findings from England and Wales, which found that only 24% of all suicides had had contact with specialist mental health services in the preceding 12 months.11 The reasons for this difference is likely to include the fact that coroner’s inquests into unexpected deaths in England and Wales usually provide “short form” verdicts for the cause of death, and “open” verdicts are recorded when the cause of death is likely to be suicide but the legal criteria (beyond reasonable doubt) has not been met. This is likely to lead to an under reporting of suicide deaths.12 Also the UK study was limited to mental health contacts in the preceding 12 months, whereas the current study examines any past contact with mental health services. It may also suggest that access to specialist mental health care is more readily available in New Zealand than in the UK.

Consistent with most national and international findings, hanging was and remains by far the most common method of suicide across inpatient and community settings.11,13–15 In accord with these findings and international recommendations for suicide prevention, removal and monitoring for potential ligature points, such as non-collapsible curtain rails, door handles and towel rails has been widely introduced.
in New Zealand psychiatric hospitals and prisons to minimise the risk of suicides in these settings.\textsuperscript{16}

Stressful life events at the last contact with MHSCDHB were identified in approximately half of all suicides. This finding is consistent with the extant literature, which identifies recent stressful life events and precipitating factors (significantly higher than for control populations) with suicide, principally interpersonal and legal problems.\textsuperscript{17,18} An important finding was that 20\% of suicides occurred in relation to periods of incarceration, mostly after prison release, which sadly mirrors similar findings from the recent Suicide Mortality Review Committee of New Zealand, which found that 27\% of suicides (between 2007–11) had previous contact with the Department of Corrections.\textsuperscript{15} This is not surprising given the high prevalence of untreated SMI in New Zealand's prisons.\textsuperscript{19} The introduction of the New Zealand Prison Screening Tool in 2012 has significantly improved identification of SMI and treatment among prisoners.\textsuperscript{20} However, there has been no research conducted to determine whether this has led to improved access to mental health care, drug and alcohol treatment or reduction in suicides after prison release, and is a matter for urgent additional research.

Accidents were the second most common cause of sudden death, predominantly from motor vehicle crashes and falls. This is likely to be influenced by the high prevalence of drug and alcohol misuse, as a primary diagnosis and from co-morbid use, which is well established in patient with SMI and premature mortality.\textsuperscript{2,3}

Cardiovascular disease was the most common natural cause for sudden death. This is not surprising and is consistent with studies of premature death for patients with SMI and the general population.\textsuperscript{2–5,21,22} High rates of alcohol and substance misuse, including tobacco, higher prevalence of unhealthy lifestyles, and decreased access to primary and specialist medical services is consistently reported for patients with SMI and contributes to cardiovascular disease.\textsuperscript{1–5} Side effects from psychotropic medications, particularly the metabolic complications associated with antipsychotic treatment have also been reported in this population.\textsuperscript{1–5}

Clinical implications

‘Real world’ clinical information on the characteristics of sudden death for patients who have received previous care from a large specialist regional mental health provider can lead to targeted interventions to mitigate premature mortality in this population.

The overall suicide rate in this study is likely to be higher than 52\%, as in 6\% of cases the Coroner could not confidently differentiate accidental deaths from suicides. Suicide was overwhelmingly the leading cause of sudden death in patients discharged or lost to specialist service follow-up, indicating that more emphasis needs to be given to preventing loss of contact with services, maintaining treatment adherence and facilitating re-engagement with specialist services. As previous studies have shown that those with a past history of medically serious suicide attempts have a higher long-term risk of suicide mortality, follow-up in this group should be maintained for at least 12 months after a suicide attempt.\textsuperscript{23}

Our review of the clinical files found that suicide risk assessments were not routinely or systematically documented. More emphasis on an organisational approach to structured risk assessments was part of a range of recommendations from Coroners to specialist mental health services in relation to suicide prevention in New Zealand.\textsuperscript{24} While this seems reasonable at face value there is now consistent evidence that risk categorisation is of limited value and may be harmful.\textsuperscript{25} A systematic meta-analysis of controlled studies of suicide within a year of discharge from psychiatric hospitals found that risk categorisation was of no value in attempts to decrease the numbers of patients who will commit suicide after discharge. Sixty percent (60\%) of patients who commit suicide were likely to be categorised as low risk and only about 3\% of patients categorised as being at high risk could be expected to commit suicide in the year after discharge.\textsuperscript{26} No factor or combination of factors was strongly associated with suicide.

In this context the challenge for clinicians is for risk management to be a part, rather than the focus of patient care. At an individual clinical level we argue for a
shift in focus towards engagement with the individual patient's specific problems and circumstances rather than placing them in arbitrary risk categories. Emphasis on stress management, service accessibility, provider education, use of digital media to engage and maintain contact with patients is important.

At a broader service level a number of service provider intervention strategies have been shown to lead to reductions in suicide rates. These include the provision of 24-hour crisis care, clear policies for management of dual diagnosis patients, and multidisciplinary review and information sharing with families after suicide attempts.27

It is noteworthy that one third of those who suicided were not in contact with mental health services at the time of their death. As a significant number of these patients were in contact with primary medical care, more emphasis on collaborative (shared) care between specialist mental health service and primary care, may provide an additional pathway for assessment, treatment and suicide prevention. Collaborative care is also likely to improve access to primary medical services, and lead to improved assessment and treatment of medical problems, in particular cardiovascular and respiratory diseases and cancers, which are under-treated and contribute not only to sudden death but also premature death and disability in patient with SMI.2–5

Multidisciplinary reviews of all suicide deaths should occur to identify gaps in local service provision and to identify additional opportunities for interventions.

Study strengths and limitation

There are several strengths to the study. It is the first study of sudden death for patients who have received care from specialist mental health services in New Zealand. It involves a relatively large sample and Coroner’s reports were available in all cases. This study however, also has several potential biases and limitations. Although Coroner’s investigations are thorough and take into consideration multiple sources of information, including from family members to improve accuracy of findings, the authors also relied on standard clinical information, which was at times incomplete and of inconsistent quality across different services. The accuracy of the diagnoses were not able to be validated and co-morbid conditions were so inconsistently documented that we were not able to utilise this data. It is well established in the literature and clinical practice that patients with SMI generally present with multiple conditions and therefore the limitation of sudden death data to only primary diagnosis has to be interpreted with caution. It is possible that sudden deaths from natural causes were under reported and investigated as these may have been mistakenly attributed to an already extant medical condition.

In addition there is no reliable data or process to estimate sudden death from natural causes in the general population and therefore there is no comparator population to give context to the findings. Patients with mental illness who have not been treated by the specialist mental health services, and have been treated solely by primary health services or in the private sector have not been captured by the data. It is therefore possible that the data has focused on a more financially and socially disadvantaged group of patients who could not afford to pay for care. Sudden death findings may therefore be more influenced by social disadvantage (such as unemployment and financial hardship) rather than mental illness. As the proportion of patients treated solely in the private sector in Canterbury is very small it is unlikely that this has significantly biased the findings.

Finally the data reflects sudden death causes from 1 January 2005 to 31 December 2009, and the patterns may have changed since then.

Conclusion

Psychiatric patients have high rates of sudden or unexpected death. The most common cause is suicide. The most potent predisposing factor appears to be alcohol and drug problems. This was the most prevalent primary diagnosis and is likely to be a comorbid diagnosis in many other diagnostic categories. In addition it is well established that alcohol and drug use problems are associated with accidents, imprisonment and cardiovascular disease.28 Therefore mental health services should
in particular be advocating for comprehensive and evidence-based alcohol and drug policies (such as increasing price and taxes on alcohol, restrictions on advertising, promotion and reducing availability of alcohol), including increased access and availability of drug and alcohol treatment programmes to help reduce sudden deaths among our patients.

**Competing interests:**
Andrew McKean has received speaker fees from Novartis.

**Author information:**
Erik Monasterio, Consultant in Forensic Psychiatry and Senior Clinical Lecturer, University of Otago, Christchurch, Hillmorton Hospital, Christchurch; Andrew McKean, Senior Pharmacist, Hillmorton Hospital, Christchurch; Vimu Sinhalage, House Surgeon, Waikato Hospital, Hamilton; Christopher Frampton, Professor, Department of Medicine, University of Otago, Christchurch; Roger Mulder, Professor, Department of Psychological Medicine, University of Otago, Christchurch.

**Corresponding author:**
Dr Erik Monasterio, Senior Clinical Lecturer, University of Otago, Clinical Director and Consultant in Forensic Psychiatry, Forensic Director Area Mental Health Services, Hillmorton Hospital, Private Bag 4733, Christchurch.

**URL:**

**REFERENCES:**


11. Appleby LL, Shaw J, Amos T, et al. Suicide within 12 months of


