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Suicide methods and specific types of accidental death and fatal poisoning among discharged psychiatric patients: a national cohort study

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Abstract

Objective—Persons discharged from inpatient psychiatric units are at greatly elevated risk of dying unnaturally. We conducted a comprehensive examination of specific causes of unnatural death post-discharge in a national register-based cohort.

Methods—A cohort of 1,683,645 Danish residents born 1967-1996 was followed from 15th birthday until death, emigration or December 31st 2011, whichever came first. Survival analysis techniques were used to estimate incidence rate ratios (IRRs) comparing risk for persons with and without psychiatric admission history in relation to: (a) suicide method; (b) accidental death type; (c) fatal poisoning type; (d) homicide.

Results—More than half (52.5%, n=711) of all unnatural deaths post-discharge were fatal poisonings, compared with less than a fifth (17.0%, n=1012) among persons in the general population not admitted. Just 6.8% (n=92) of all unnatural deaths post-discharge were transport accidents - the most common unnatural death type in the general population (53.4%, n=3184). Suicide risk was 32 times higher among discharged patients (IRR 32.3; 95% CI 29.2-35.8), and was even higher during the first year post-discharge (IRR 70.4; 95% CI 59.7-83.0). Among the suicide methods examined, relative risk values were significantly larger for intentional self-

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poisoning (IRR 40.8; 95% CI 33.9-49.1) than for 'violent' suicide methods (IRR 29.4; 95% CI 26.1-33.2). The greatest relative risk observed was for fatal poisoning (irrespective of intent) by psychotropic medication (IRR 93.7; 95% CI 62.5-140.5). The highest post-discharge mortality rate was for accidental self-poisoning among persons diagnosed with a psychoactive substance abuse disorder: 290.1 per 100,000 person-years.

Conclusion—Closer liaison between inpatient services and community care, more effective early treatment for co-morbid substance abuse, enhanced psychosocial assessment following self-harm and tighter medication surveillance could decrease risk of unnatural death post-discharge.

Introduction

Mental illness is associated with premature mortality, 1–3 and persons with a history of inpatient psychiatric treatment are at especially elevated risk.^{4–8} Relative risk of dying unnaturally in this population, compared to persons not admitted for psychiatric treatment, is much higher than that of dying naturally.⁸ However, no published studies have comprehensively examined specific causes of unnatural death in a single cohort thereby enabling direct comparison of risks. Whereas a substantial body of literature is available on mental illness and suicide risk,^{9–12} far fewer studies have reported on other unnatural causes of death such as accidents in this population.^{13,14}

We conducted a national register-based cohort study to examine the following causes of unnatural death among persons following first discharge from inpatient psychiatric services: 1) suicide method; 2) accidental death type; 3) fatal poisoning type; 4) homicide. Most previous studies have examined suicide methods^{15–18} or types of accidental death¹³ separately. Thus, as only a limited literature^{19,20} reports on multiple causes of unnatural death in the same population, an especially novel feature of this study is assessment of different suicide methods and specific types of accidental death and fatal poisoning, including the poisoning agent used, all in one national cohort. We hypothesized that risk would be markedly elevated for each cause of death examined versus persons not admitted for inpatient psychiatric treatment, and that relative risk for intentional self-poisoning would be greater than for 'violent' suicide methods.¹⁷

Methods

Data sources

The study was approved by the Danish Data Protection Agency, the State Serum Institute and Statistics Denmark. In accordance with the Act on Processing of Personal Data, anonymity and confidentiality were strictly maintained by replacing identification numbers with randomly generated personal identifiers. We analyzed data extracted from the Civil Registration System (CRS), which has captured vital status information on all Danish residents since 1968. This register can be linked with other national registers via a personal identification number.²¹ We linked information from the CRS with information from the Psychiatric Central Research Register²² and the Register of Causes of Death.²³

Study cohort

We examined all persons born in Denmark during years 1967-1996, inclusive who were residing in the country at their 15th birthday (N=1,683,645). To eliminate potential confounding due to elevated psychopathology risk among immigrants²⁴ we restricted the cohort to persons with both parents born in Denmark. We also excluded individuals discharged from inpatient psychiatric care at least once before their 15th birthday (n=5529). Follow-up commenced on cohort members' 15th birthdays and was terminated at death, emigration or end of follow-up, whichever came first. During the follow-up period, January 1st 1982 to December 31st 2011, we compared persons who experienced their first discharge from an inpatient psychiatric unit, or a psychiatric ward in a general hospital, after their 15th birthday to persons without history of psychiatric inpatient treatment (i.e. the reference group). Depending on whether cohort members' 15th birthdays occurred adjacent to the beginning or end of the study's 30 year observation period, the minimum age in years when their follow-up ceased was 15 and the maximum was 44, which was also the age range at first discharge from inpatient psychiatric care. The amount of person-time at risk that each cohort member could possibly contribute to the denominator ranged from 1 day to 30 years.

Outcomes and covariates

We extracted information from the Register of Causes of Death to classify underlying causes of death based on the International Classification of Diseases, 8th revision (ICD-8) 25 and 10th revision (ICD-10); 26 ICD-9 was never introduced in Denmark. Supplementary eTable1 lists the ICD-8 and ICD-10 codes used for these classifications. Deaths by self-poisoning with psychotropic medication and self-poisoning with narcotics and hallucinogens were restricted to ICD-10 coded deaths that occurred from January 1st 1994 onwards, due to inconsistency between ICD 8th and 10th revisions. We obtained clinical information, including first discharge date and psychiatric diagnosis at first inpatient episode, from the Psychiatric Central Research Register. We utilized primary and secondary diagnostic codes and applied a hierarchical approach^{8,27} to classifying them to ensure mutual exclusivity between groups (Supplementary eTable2).

Statistical analyses

Risks of dying from specific causes were compared between persons discharged from their first inpatient psychiatric episode versus individuals without history of psychiatric admission. The registry data available did not distinguish between deaths that occurred in the community on discharge date versus those that happened during the inpatient episode, with those cases categorized as inpatient deaths. We calculated incidence rates and estimated incidence rate ratios (IRRs) and their 95% confidence intervals (CIs) using Poisson regression with person-time denominators. The Poisson models were adjusted for age and calendar-year, both categorized into 5-year bands, and gender, to account for these potential confounding influences at first discharge and throughout post-discharge follow-up.

Results

Cohort characteristics

Among the 1,683,645 cohort members, 47,077 (2.8%) were discharged at least once from inpatient psychiatric care on or after their 15th birthday. eTable 3 profiles their sociodemographic and clinical features. There was a slight female predominance (51.1%) and 55.4% were aged below 25 years at first discharge, with more than a quarter (26.9%) being in their mid-late teens at this event. Thus, cohort members were studied mostly at young adult age, but their maximum age during follow-up was 44 years. Among the psychiatric diagnostic categories examined, neurotic, stress-related and somatoform disorders (25.8%) were the most common followed by psychoactive substance abuse (22.3%). Most discharged patients (94.0%) were admitted voluntarily at their first inpatient episode, and most of them had a length of stay of 30 days or less (71.5%). Among discharged persons, 19.4% had harmed themselves before their first inpatient treatment episode.

Incidence rates and distribution of deaths by specific cause

The incidence rate was higher for suicide than for accidental death among the discharged patients whereas, among persons not admitted, accidental death occurred more frequently than suicide (Table 1). For both groups, the incidence rate for ‘violent’ suicide methods was higher than for intentional self-poisoning, with hanging, strangulation or suffocation being the most common method in both. This method, combined with intentional self-poisoning, accounted for approximately two-thirds of all suicides among discharged individuals (67.8%, n=436) and among the comparator cohort members (63.7%, n=812). Among discharged patients who died accidentally, far more persons died from accidental self-poisoning than from transport accidents or accidental falls. This contrasted with individuals without psychiatric admission history, who had higher incidence rates for dying from transport accidents than by accidental self-poisoning. More than half (52.5%, n=711) of all unnatural deaths in the discharged group were fatal poisonings, compared with less than a fifth (17.0%, n=1012) among persons not admitted; just 6.8% (n=92) of all unnatural deaths in the discharged group were transport accidents, compared with more than a half (53.4%, n=3184) among those not admitted. From 1994, the year from when we could examine this particular ICD-10 category, approximately half of all the fatal poisonings involved a narcotic or hallucinogenic drug among both discharged cohort members (47.0%, n=314) and those without psychiatric hospitalization history (51.7%, n=457). In eTables 4 and 5 in the supplementary material, incidence rates for specific causes of death are reported by diagnostic category. For intentional self-poisoning, accidental self-poisoning and all other accidental deaths, the highest incidence rates were among persons discharged with a psychoactive substance abuse disorder diagnosis. In this diagnostic category, the incidence rate for accidental self-poisoning (290.1 per 100,000 person-years) was almost 4 times higher than for intentional self-poisoning (77.9 per 100,000).

Incidence rate ratios (IRRs)

Suicide—Persons discharged from inpatient psychiatric services had a markedly elevated suicide risk compared to those without psychiatric admission (Figure 1). Although incidence

of suicide by any violent method was higher than for intentional self-poisoning, relative risk was significantly higher for intentional self-poisoning (IRR 40.8; 95% CI 33.9-49.1 vs. IRR 29.4; 95% CI 26.1-33.2), and was also significantly higher for intentional self-poisoning specifically with prescribed or illicit drugs (IRR 64.8; 95% CI 50.9-82.6) than for all other poisoning agents combined (IRR 19.3; 95% CI 13.9-26.8). Among 'violent' methods, the largest relative risk value observed was for jumping from a height: IRR 85.6; 95% CI 55.6-132.0. It is, however, important to emphasize the imprecision of this estimate, and also that this specific method accounted for only 8.1% of all suicide cases and 3.8% of all unnatural deaths post-discharge. Persons diagnosed with schizophrenia and related disorders, mood disorders and personality disorders had particularly elevated suicide risks, as shown in supplementary eTable 4.

Accidental death—The relative risk for accidental death (Figure 2) was more than three times lower than that for suicide. Compared to persons not admitted for psychiatric treatment, discharged patients were at much greater elevated risk for accidental poisoning (IRR 32.5; 95% CI 28.2-37.5) than for other accidental death types. As was observed for intentional self-poisoning, the IRR was significantly higher for accidental self-poisoning from prescribed and illicit drugs (IRR 33.8; 95% CI 29.2-39.2) than for all other poisoning agents combined (IRR 13.2; 95% CI 6.2-28.2). Compared to other types of accidental death, the risk of fatal transport accidents was only modestly elevated among discharged patients compared to those without psychiatric admission. Nonetheless, discharged patients were at least twice as likely to die from this cause as individuals without inpatient psychiatric history (IRR 2.7; 95% CI 2.2-3.4). As presented in supplementary eTable 5, among the diagnostic categories examined, psychoactive substance abuse conferred the greatest risk of dying accidentally (IRR 21.4; 95% CI 19.0-24.1), with a particularly marked risk elevation observed for accidental self-poisoning among persons in this diagnostic group (IRR 78.3; 95% CI 66.5-92.1).

Homicide—This outcome occurred exceptionally rarely even among persons discharged, although elevated risk (IRR 7.4; 95% CI 4.7-11.7) was observed versus individuals not admitted.

Fatal poisoning—The observed IRRs did not vary markedly when comparing intentional, accidental and self-poisoning of undetermined intent, with accidental self-poisoning having a slightly lower IRR value compared with the other two fatal self-poisoning categories (Figure 3). For all fatal poisonings (irrespective of intent), the relative risk was significantly higher for poisoning with prescribed or illicit drugs (IRR 42.0; 95% CI 37.6-47.0) than for all other poisoning agents combined (IRR 19.6; 95% CI 14.7-26.1). The highest IRR value among the cause-specific mortality outcomes examined was for poisoning by psychotropic medication, with discharged patients having approximately a 90 times elevated risk compared to persons not admitted (IRR 93.7; 95% CI 62.5-140.5).

Gender-specific IRRs

Compared to men, discharged women had significantly greater relative risks for suicide by any method, intentional self-poisoning, suicide by any 'violent' method, and any fatal

poisoning (Table 2); $p < 0.001$ for each of these four categories. There was no significant difference between the gender-specific IRRs in relation to accidental death; $p = 0.10$. Although the IRRs were consistently greater for women, the incidence rate was higher for men in both the discharged and comparison group for each of these five cause-specific categories.

IRRs within a year of first discharge

Within one year post-discharge, suicide risk among former inpatients was 70 times higher versus persons not admitted ($n = 161$; IRR 70.4; 95% CI 59.7-83.0). Similarly, relative risks for intentional self-poisoning ($n = 46$; IRR 82.6; 95% CI 60.5-112.8), for suicide by any 'violent' method ($n = 115$; IRR 66.6; 95% CI 54.8-80.9), and for fatal poisoning (irrespective of intent) ($n = 108$; IRR 55.6; 95% CI 45.6-67.8) were greatly elevated during the first year post-discharge.

Discussion

Main findings

This national cohort study comprehensively investigated cause-specific unnatural death among persons discharged from their first episode of inpatient psychiatric care. These persons discharged were at elevated risk for each specific cause of unnatural death examined compared to persons without inpatient psychiatric history. The relative risk for suicide was approximately 3-4 times higher than that for dying accidentally or by homicide. Among patients who died by suicide, relative risk was greater for any fatal self-poisoning than for any 'violent' suicide method. Among accidental deaths in the discharged group, self-poisoning occurred more frequently than all other types of fatal accident, with transport accident deaths having the smallest risk increase among discharged patients versus those without admission history. For fatal self-poisoning, the relative risk was greater for poisoning with prescribed or illicit drugs than for all other poisoning agents combined. The highest IRR observed across the causes of death examined was for fatal poisoning with psychotropic medication (irrespective of intent). Females had consistently greater IRRs than males, even though male incidence rates were higher for each cause of death examined, among persons discharged and also those without inpatient psychiatric history. For most outcomes, risk was greatly elevated within one year post-discharge compared to the unrestricted follow-up. Persons discharged and diagnosed with schizophrenia and related disorders, mood disorders and personality disorders had especially elevated suicide risks. Individuals diagnosed with psychiatric substance abuse disorders were particularly prone to dying by accidental self-poisoning and incidence of accidental fatal overdose with a narcotic or hallucinogenic drug was especially raised for this diagnostic category post-discharge.

Comparison with existing evidence

Our findings are consistent with the published literature reporting on unnatural causes of death among persons diagnosed with mental illnesses. Several studies have shown that persons with histories of inpatient psychiatric care are at elevated suicide risk^{8,9,12,17,20,28} and a smaller number of investigations have also indicated raised accidental death risk.^{1,13} Our findings concur with those reported by Black et al., who examined suicide and

accidental death in a cohort of discharged psychiatric patients,²⁰ and who reported a higher standardized mortality ratio (SMR) for death by suicide compared to accidental death. In contrast to our results these authors found a difference between males and females in relation to fatal accidents, with females having a higher relative risk than males. In terms of suicide methods among former psychiatric inpatients, the published literature is inconclusive.^{15–17} A large registry study from Sweden¹⁷ examined persons diagnosed with personality disorders and showed, as in our study, that discharged patients were at particularly heightened risk for intentional self-poisoning compared to persons without psychiatric admission history. These authors reported that the lowest SMR was for death by firearms, irrespective of gender, as was also shown in our study; however, the highest SMRs that they observed were for jumping from height among men and hanging among women. Due to the small number of cases for some outcomes, we did not estimate gender-specific incidence rate ratios across the full array of unnatural causes of death. Several reasons can explain between-study variability in findings, including underlying differences between study populations such as country and psychiatric diagnoses, as well as inadequate statistical power for investigating rare cause-specific mortality outcomes. Our study cohort mostly comprised young adults, which could also be an important contributory factor in explaining these differences.

The most comprehensive study of accidental death to date has been carried out by Crump et al.¹³ using Swedish national registry data. Comparing the relative risks for several types of accidents between persons with history of inpatient or outpatient psychiatric care and the general population, the risk of accidental death by poisoning was reported to be markedly elevated, followed by fatal accidental falls and transport accidents. The same rank order of relative risks was observed in our Danish study, although our relative risk estimates were slightly higher than the ones presented by Crump et al. for each cause of death examined. Co-morbid substance abuse explained a sizeable amount of the excess risk for accidental death observed in the Swedish study,¹³ although other factors, such as sleeping problems^{29,30} or chronic fatigue³¹ could place discharged patients at elevated risk for accidental death. Heightened homicide victimization risk, as reported from other studies,^{32–34} may be partially explained by co-morbid substance abuse.³² Other factors involved in this risk elevation include reduced awareness of hazardous situations in persons with mental illnesses,^{33,34} and psychiatric patients more often living in deprived areas with higher violent criminality rates.³⁵

The preponderance of fatal poisonings involving a narcotic or hallucinogenic drug was likely due specifically to overdoses of methadone and heroin/morphine, which together accounted for 84% of all cases among fatally intoxicated drug addicts in an investigation conducted across three forensic medicine institutes in Denmark during 2007.³⁶ Despite strict regulations regarding heroin substitution and surveillance of methadone use, in Denmark the majority (60%) of opiate-related deaths are caused by methadone overdose (versus 34% by heroin), with methadone involved in a disproportionately high number of these fatal overdoses compared to other European countries like Sweden, Finland, Ireland and Estonia.³⁷

Strengths & limitations

The study's main strength is its novel comprehensive examination across the full spectrum of cause-specific unnatural death among persons discharged in a large national cohort. The cohort's size and the high-quality administrative registry data,²¹ which covers every Danish resident, enabled assessment of exceptionally rare cause-specific mortality outcomes with ample statistical power and precision. We examined specific suicide methods as well as types of accidental death and fatal poisoning. We assessed all psychiatric diagnoses in contrast to restricting our cohort to a certain diagnosis, as in previous studies.^{14,17}

The study was, however, limited in certain ways. As is true for registry studies generally, the availability of relevant covariates was restricted by the data being collected routinely for administrative rather than for research purposes.³⁸ For example, type of psychiatric unit or whether a person discharged themselves against medical advice,²⁸ could not be assessed. Despite the cohort's huge size, event counts were low for certain causes of death, especially homicide; therefore we could not stratify the rarest outcomes by gender. We could not distinguish between deaths that occurred immediately after discharge on the same day versus those that happened during inpatient episodes. Also, the ICD coding did not enable examination of fatal poisoning by prescribed medication versus an illicit drug as discrete causes of death. Classification of accidental versus intentional poisoning is particularly challenging in relation to fatal drug overdoses.³⁹ We could not, however, infer the degree to which such misclassification attenuated the relative risk estimates observed, and therefore we also reported 'any fatal poisoning' as a coalesced outcome category, as well as accidental, intentional and undetermined fatal poisonings separately. Also, cause of death determination procedures in Denmark may ascertain a greater proportion of equivocal suicide cases than in some other Western European countries such as England.⁴⁰ A final limitation concerns generalizability. In a study cohort of persons discharged for the first time from inpatient psychiatric care predominantly at younger adult age, most were diagnosed with non-psychotic disorders and almost all were admitted voluntarily. As equivalent data are unavailable elsewhere we do not know the degree to which study cohorts delineated similarly in other countries would be comparable clinically.

Conclusion

This national cohort study has revealed markedly elevated risks across the array of unnatural causes of death examined. Therefore an eclectic set of effective preventive measures is indicated if the incidence of unnatural death is to be reduced in this patient population with multiple vulnerabilities. Individuals discharged from inpatient psychiatric services for the first time are at greatly elevated risk of fatally poisoning themselves, irrespective of their intent, and particularly using prescribed or illicit drugs. Clinicians should strive to reduce risk of fatal poisoning with prescribed drugs by enhancing post-discharge care and introducing more vigilant monitoring of medication among discharged patients. Mental health services can enhance the safety of their patients by distributing drugs in smaller quantities at each prescription, although some patients may still hoard medication to acquire a quantity sufficient to end their life. Strategies that successfully enhance compliance in taking psychiatric medication⁴¹ could therefore be beneficial given the low adherence rates in this population.^{42,43} To reduce risk of suicide by violent suicide methods, it is crucial to

act on thoughts about using those methods disclosed by former inpatients, to ensure their safety by enhanced liaison between inpatient services and post-discharge community care. This is particularly relevant for individuals known to have attempted suicide using violent methods. Therefore it is crucial for clinicians to inquire about suicidal ideation, detailed plans of self-harm and previous thwarted suicide attempts. The markedly elevated risk of unnatural death, accidental poisoning in particular, among persons discharged with psychoactive substance abuse disorders indicates a need for interventions targeting dependency issues early on in treatment. Effective therapy and other support services post-discharge should be provided to individuals known to abuse substances, including alcohol, and enhanced psychosocial assessment and monitoring following self-harm episodes could also reduce risk of premature unnatural death in this population.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Clinical points

- More than a half of all unnatural deaths among persons first-discharged from inpatient psychiatric care were poisonings, whereas 1 in 6 of all unnatural deaths were poisonings among comparator cohort members in the general population.
- A diverse range of effective preventive measures will be required to achieve a significant reduction in risk of dying from unnatural causes post-discharge.
- Specifically, closer liaison between inpatient services and community care, more effective early treatment for co-morbid substance abuse, enhanced psychosocial assessment following self-harm and tighter medication surveillance could decrease risk of unnatural death.

Figure 1. Incidence rate ratios (IRRs) for suicide by specific method after first inpatient discharge compared to persons not admitted ^a

^a Estimated IRRs were adjusted for gender, age-and calendar year

Figure 2. Incidence rate ratios (IRRs) for specific types of accidental death after first inpatient discharge compared to persons not admitted ^a

^a Estimated IRRs were adjusted for gender, age-and calendar year

Figure 3. Incidence rate ratios (IRRs) for specific types of fatal poisoning after first inpatient discharge compared to persons not admitted ^{a,b,c}

^a Estimated IRRs were adjusted for gender, age-and calendar year

^b Estimated IRRs for 'Poisoning death' includes intentional self-poisoning (suicide), accidental self-poisoning and self-poisoning of undetermined intent

^c Estimated IRRs for 'Psychotropic medication' and 'Narcotic or hallucinogen' include only ICD-10 coded deaths that occurred from 1st January 1994 onwards; does not include ICD-8 coded deaths that occurred prior to 1st January 1994

Table 1
Number of deaths and incidence rates for specific causes of unnatural death

Cause of death	Discharged patients: N=47,077		Persons not admitted: N=1,636,568	
	Number of deaths	Incidence per 100,000 person years	Number of deaths	Incidence per 100,000 person years
Any unnatural death	1353	361.3	5959	24.9
Suicide				
Any suicide method	643	171.7	1274	5.3
Intentional self-poisoning	214	57.1	311	1.3
Prescribed or illicit drug	164	43.8	132	0.6
Other poisoning agent	50	13.4	179	0.7
'Violent' method	429	114.6	963	4.0
Hanging, strangulation, suffocation	222	59.3	501	2.1
Drowning	20	5.3	39	0.2
Firearm or explosive	37	9.9	230	1.0
Sharp instrument	16	4.3	13	0.1
Jumping from a height	52	13.9	45	0.2
All other 'violent' methods	82	21.9	135	0.6
Accidental death				
Any accidental death	494	131.9	4208	17.6
Accidental self-poisoning	332	88.7	523	2.2
Prescribed or illicit drug	323	86.2	482	2.0
Other poisoning agent	9	2.4	41	0.2
Transport accident	92	24.6	3184	13.3
Accidental fall	14	3.7	92	0.4
All other accidental deaths	56	15	409	1.7
Fatal poisoning ^a				
Any fatal poisoning	711	189.9	1012	4.2
Intentional	214	57.1	311	1.3
Accidental	332	88.7	523	2.2
Undetermined intent	165	44.1	178	0.7
Prescribed or illicit drug	644	172	784	3.3
Other poisoning agent	67	17.9	228	1.0
Psychotropic medication ^b	96	25.6	45	0.2
Narcotic or hallucinogen ^b	314	83.8	457	1.9
Homicide	21	5.6	186	0.8

^a Includes intentional self-poisoning (suicide), accidental self-poisoning and self-poisoning of undetermined intent

^b Includes only ICD-10 coded deaths that occurred 1st January 1994 onwards; does not include ICD-8 coded deaths that occurred prior to 1st January 1994

Table 2
Gender-specific incidence rate ratios (IRRs) for specific unnatural causes of death
following first inpatient discharge compared to persons not admitted

Cause of death	Number of deaths	Incidence per 100,000	IRR ^a	95% CI	
Any suicide ^b :					
Males	452	246.3	26.4	23.5	29.7
Females	191	100.0	68.9	55.3	85.8
Intentional self-poisoning ^b :					
Males	127	69.2	30.5	24.3	38.2
Females	87	45.5	80.4	57.0	113.4
'Violent' suicide method ^b :					
Males	325	177.1	25.1	22.0	28.8
Females	104	54.4	61.8	46.4	82.4
Any accidental death ^c :					
Males	382	208.2	8.9	8.0	9.9
Females	112	58.6	11.4	9.3	14.0
Any fatal poisoning ^{b, d} :					
Males	504	274.7	31.9	28.4	35.7
Females	207	108.4	70.2	56.5	87.3

^a Estimated incidence rate ratios were adjusted for age and calendar year

^b Significant interaction was observed between outcome and gender (P<0.001)

^c No significant gender interaction observed (P=0.10)

^d Includes intentional self-poisoning (suicide), accidental self-poisoning and self-poisoning of undetermined intent