

Death by homicide, suicide, and other unnatural causes in people with mental illness: a population-based study

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Summary

Background People with mental illness are at great risk of suicide, but little is known about their risk of death from other unnatural causes. No study has commented on their risk of being victims of homicide; public concern is pre-occupied with their role as perpetrators. We aimed to calculate standardised mortality ratios (SMRs) and directly standardised rate ratios for death by homicide, suicide, and accident in people admitted to hospital because of mental illness.

Method We did a population-based study in which we linked the data for 72 208 individuals listed in the Danish Psychiatric Case Register between 1973 and 1993, and who died before Dec 31, 1993, with data in the Danish National Register of Causes of Death.

Findings 17 892 (25%) patients died from unnatural causes. Our results show raised SMRs for homicide, suicide, and accident for most psychiatric diagnoses irrespective of sex. The all-diagnosis SMRs for women and men, respectively, were: 632 (95% CI 517–773) and 609 (493–753) for homicide, 1356 (1322–1391) and 1212 (1184–1241) for suicide, and 318 (305–332) and 466 (448–484) for accident. We recorded an increased risk of dying by homicide in men with schizophrenia and in individuals with affective psychosis. The highest risks of death by homicide and accident were in alcoholism and drug use, whereas the highest risks of suicide were in drug use.

Interpretation People with mental disorders, including severe mental illness, are at increased risk of death by homicide. Strategies to reduce mortality in the mentally ill are correct to emphasise the high risk of suicide, but they should also focus on other unnatural causes of death.

Lancet 2001; **358**: 2110–12

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Introduction

People with mental disorders have high rates of suicide, although estimates of risk vary according to duration of follow-up and in some diagnoses—ie, learning disability and dementia—high risk has not been seen.¹ There is less evidence on other kinds of unnatural mortality, and specific causes of death such as accidents and homicides are frequently not distinguished.² Reports on homicide in association with mental illness focus on the mentally ill as perpetrators rather than victims,^{3,4} and discrimination against the mentally ill is thought to arise in part from the perception that they are dangerous.⁵ However, people with mental illness are also frequently victims of violent crime.⁶ Our aim was to ascertain the risk of death by homicide, suicide, and accident in psychiatric patients.

Methods

We did a study based on information collected about the Danish population over 21 years and entered in two databases: the Danish Psychiatric Case Register and the Danish National Register of Causes of Death. The Danish Psychiatric Case Register is a record of all people aged 15 years and older who have been admitted to hospital in Denmark with a psychiatric disorder since 1973.⁷ We used the unique identification number that every Danish resident is assigned to link the data in these two registers. We thereby identified people on the case register between 1973 and 1993 who had died on or before Dec 31, 1993, from suicide (includes open verdicts), accident, or homicide. Open verdicts are often included in suicide analyses; without their inclusion, suicide figures are underestimated.⁸

We included the following variables in our analysis: sex, age, year of death (for standardisation), cause of death, and psychiatric diagnosis at first admission. During the study, we identified diagnoses and causes of death according to International Classification of Diseases, 8th edition (ICD8). This coding system changed in 1993, and subsequent diagnoses by ICD10 were not strictly comparable. We included year of death because of the variability by year of death rates between different age groups.

We calculated standardised mortality ratios (SMRs) and 95% CIs by a person-years at risk method. Because SMRs can vary according to the age structure of the reference population, making internal comparisons—eg, between dementia and schizophrenia—difficult, rate ratios standardised directly to a common age distribution are sometimes preferable. In our study, the 1983 Danish population was used to calculate directly standardised rate ratios (DSRRs), and where these differ from SMRs they are also reported. Both SMRs and DSRRs are reported as proportions. We used STATA (version 6.0) to calculate SMRs.

Results

From 1973 to 1993, 257 720 patients were added to the case register: 119 543 women and 138 177 men. During this period, 29 702 women and 42 506 men died, 17 892 (25%) from unnatural causes (8098 women and 9794

men). Of these unnatural deaths, 181 (1%) were by homicide, 12 977 (73%) by suicide, and 4734 (26%) by accident. The table shows the SMRs and crude rates by diagnosis and sex for homicide, suicide, and accident. In most diagnostic groups, there is a high rate of homicide. The highest relative risks were associated with drug use, alcoholism, personality disorders, schizophrenia (men), and organic psychoses (women). Overall, the risk of being a victim of homicide was increased six-fold for people with a mental illness compared with those without. DSRs were similar to SMRs in most groups, but were higher in women with alcoholism (DSRR 3176) or who had dementia (4088), and in men with learning disabilities (2094) or who were drug users (4178).

Risk of committing suicide was raised for both sexes in all diagnostic categories. Patients with alcoholism who were drug users, or who had affective psychoses or personality disorders were most at risk. Those least likely to commit suicide were patients with learning disabilities or dementia. Overall there was at least a 12-fold increase in risk in both sexes. DSRs were similar to SMRs in most groups, but were higher in patients with affective

psychoses (women 2322, men 2299), dementia (1812, 840), and other non-psychotic conditions (2338, 2199). 1055 men (15%) and 779 women (13%) in the suicide sample received open verdicts. Excluding these patients from analyses made little difference to the SMRs except in the drug use (women 16 377, men 13 729) and alcoholism groups (12 976, 9517).

The risk of accidental death was also raised irrespective of diagnosis. The highest risks were in drug use and alcoholism. Overall, there was a three-fold increase in risk in women and a higher than four-fold increase in men. DSRs were generally similar to SMRs but were lower in women with alcoholism (694) and men who were drug users (1153).

Discussion

Our results indicate high rates of death from homicide, suicide, and accident in people who have been psychiatric inpatients. Most psychiatric diagnoses were associated with increased mortality from all three causes, the highest risks of homicide and accident being in drug use and alcoholism, and the highest risk of suicide being in drug

Diagnosis	Person-years	Cause of death								
		Homicide			Suicide			Accident		
		Number	Rate per 1000 person-years	SMR (95% CI)	Number	Rate per 1000 person-years	SMR (95% CI)	Number	Rate per 1000 person-years	SMR (95% CI)
Schizophrenia										
Women	54595	2	0.04	341 (85–1363)	188	3.44	1080 (936–1246)	62	1.14	287 (224–369)
Men	74539	7	0.09	734 (350–1539)	404	5.42	1073 (973–1183)	70	0.94	213 (168–269)
Affective psychoses*										
Women	309639	10	0.03	327 (176–608)	1704	5.50	1600 (1526–1678)	390	1.26	210 (190–232)
Men	155337	5	0.03	305 (127–732)	1446	9.31	1644 (1562–1731)	215	1.38	223 (195–254)
Non-affective psychoses†										
Women	130314	5	0.04	354 (148–851)	457	3.51	1109 (1012–1215)	170	1.30	269 (231–312)
Men	86696	4	0.05	353 (132–940)	597	6.89	1381 (1275–1496)	118	1.36	273 (228–327)
Neurosis										
Women	246226	5	0.02	197 (82–472)	844	3.43	1008 (942–1078)	175	0.71	233 (201–270)
Men	84782	2	0.02	204 (51–816)	364	4.29	808 (729–895)	88	1.04	232 (188–285)
Personality disorder‡										
Women	205211	19	0.09	782 (499–1226)	943	4.60	1568 (1471–1672)	196	0.96	465 (404–535)
Men	181404	14	0.08	536 (311–922)	1073	5.91	1198 (1128–1272)	287	1.58	406 (361–455)
Alcoholism										
Women	65835	13	0.20	1704 (990–2935)	337	5.12	1586 (1425–1764)	175	2.66	1341 (1156–1555)
Men	210039	21	0.10	821 (535–1259)	1213	5.78	1064 (1005–1125)	721	3.43	877 (815–944)
Drug use										
Women	39009	7	0.18	1562 (745–3277)	270	6.92	2397 (2128–2701)	132	3.38	1445 (1219–1714)
Men	39910	14	0.35	2459 (1456–4152)	450	11.28	2460 (2243–2698)	330	8.27	2034 (1826–2265)
Organic psychoses§										
Women	63046	9	0.14	1351 (703–2597)	289	4.58	1461 (1302–1639)	140	2.22	370 (313–436)
Men	60592	1	0.02	138 (19–978)	363	5.99	1139 (1028–1263)	209	3.45	536 (468–613)
Dementia¶										
Women	50767	1	0.02	240 (34–1701)	73	1.44	452 (359–569)	430	8.47	303 (275–333)
Men	36271	1	0.03	363 (51–2576)	92	2.54	382 (311–468)	328	9.04	463 (416–516)
Learning disability 										
Women	12220	1	0.08	707 (100–5018)	15	1.23	432 (260–716)	14	1.15	633 (375–1070)
Men	13198	1	0.08	571 (81–4056)	20	1.52	314 (203–487)	22	1.67	408 (268–619)
Other non-psychotic conditions**										
Women	212956	23	0.11	900 (598–1354)	817	3.84	1439 (1344–1541)	182	0.85	321 (277–371)
Men	176590	16	0.09	644 (394–1052)	1018	5.76	1232 (1159–1310)	280	1.59	360 (320–404)
Total										
Women	2332584	95	0.07	632 (517–773)	5937	4.27	1356 (1322–1391)	2066	1.49	318 (305–332)
Men	4787163	86	0.08	609 (493–753)	7040	6.29	1212 (1184–1241)	2668	2.38	466 (448–484)

*Includes manic depressive psychoses and certain reactive psychoses (ICD8: 298.03, 298.19); †Includes certain reactive psychoses (ICD8: 297, 298.19–298.39) and other non-classifiable psychoses (ICD8: 298.99, 299); ‡Includes psychopathy; §Includes psychoses due to syphilis in the central nervous system (CNS), psychoses and non-psychotic conditions associated with epilepsy, and psychoses and non-psychotic conditions associated with other physical illness; ¶Presenile and senile psychoses and psychoses associated with vascular disorders in the CNS (mostly vascular dementia); ||Listed as mental retardation; **listed as other diagnosis in Danish Psychiatric Care register.

Standardised mortality ratios (SMRs) for homicide, suicide, and accident, by diagnostic category

use. However, perhaps our most important finding is the high risk of death by homicide among people with mental disorders, including severe mental illnesses such as schizophrenia and affective psychoses. These findings on homicide have not been highlighted in previous reports of mortality in psychiatric patients.^{2,9}

Inpatient facilities in Denmark are all in public hospitals. Our findings are, therefore, based on figures from a whole population, and calculations of risk by two different methods did not affect overall conclusions. However, certain criticisms can be made. All individuals had been inpatients, suggesting severe illness. Estimates of risk, especially suicide risk, in a sample that included community patients might have been lower than the figures presented here. Furthermore, the diagnoses were based on judgments made by doctors and were not standardised. In some diagnosis or sex groups, especially in deaths by homicide, the estimated mortality ratios are based on only a few cases. Additionally, although the risk of homicide is raised, the actual risk remains substantially lower than the risk of suicide or death by accident. Finally, we do not know whether our findings can be extrapolated to other countries, which have different systems of mental-health care and for determining cause of death.

A high mortality from homicide in drug use and alcoholism might be predicted, since these groups would be expected to live in, and contribute to, a violent subculture. Why, however, should people with affective psychoses and men with schizophrenia be at increased homicide risk? Several factors might contribute. First, such people might be more likely to live in places where homicide rates are generally high, such as inner cities. Second, they might have behavioural characteristics, such as alcohol or drug misuse, that increase their risk. Third, they might provoke the hostility of others through the symptoms of illness, such as irritability or paranoia. Fourth, they might, as a result of illness, be less aware of their own safety needs. Fifth, they might be killed by other mentally ill people with whom they are in contact—mentally ill people who kill, most often kill family members.⁴ Finally, they might be more likely to be victims of motiveless killings because of their appearance. Whatever the cause, the public and the media, who have historically been concerned about the risk that the mentally ill present to others, should be made aware of the vulnerability of these patients to the violence of others.

However, most unnatural deaths in mental disorders

are by suicide. Our results suggest, by contrast with previous findings,¹ that high rates of suicide in people with mental disorders extend to all diagnostic groups, including learning disability and dementia, though this finding could reflect the fact that all patients were ill enough at one stage to be admitted to hospital. There is also a high risk of death from accidental causes in all mental disorders. Our results particularly emphasise the risk of unnatural death in people with alcoholism who are drug users. Services for these groups should routinely assess suicide risk and alert their patients to the risks they could face. Overall, our findings confirm the need to emphasise suicide in any strategy to reduce mortality among the mentally ill, but they also show the need for such strategies to cover all unnatural deaths.

Contributors

U Hiroeh, L Appleby, and P B Mortensen designed the study and wrote the report. U Hiroeh did the experimental work, supervised by L Appleby and P B Mortensen, and analysed the results. P B Mortensen did the record linkage and helped analyse results. G Dunn supervised the analysis and contributed to the final version of the report.

Acknowledgments

We thank Anne Vingård Olesen for advice on analysis, and Gurli Pertu for help with record linkage and preparation of the dataset.

The work was funded by the Danish Medical Research Council.

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