

RESEARCH

The gap in life expectancy from preventable physical illness in psychiatric patients in Western Australia: retrospective analysis of population based registers

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Abstract

Objective To examine the mortality experience of psychiatric patients in Western Australia compared with the general population.

Design Population based study.

Setting Western Australia, 1985-2005.

Participants Psychiatric patients (292 585) registered with mental health services in Western Australia.

Main outcome measures Trends in life expectancy for psychiatric patients compared with the Western Australian population and causes of excess mortality, including physical health conditions and unnatural causes of death.

Results When using active prevalence of disorder (contact with services in previous five years), the life expectancy gap increased from 13.5 to 15.9 years for males and from 10.4 to 12.0 years for females between 1985 and 2005. Additionally, 77.7% of excess deaths were attributed to physical health conditions, including cardiovascular disease (29.9%) and cancer (13.5%). Suicide was the cause of 13.9% of excess deaths.

Conclusions Despite knowledge about excess mortality in people with mental illness, the gap in their life expectancy compared with the general population has widened since 1985. With most excess deaths being due to physical health conditions, public efforts should be directed towards improving physical health to reduce mortality in people with mental illness, in addition to ongoing efforts to prevent suicide.

Introduction

The excess mortality associated with mental illness has been extensively documented.¹⁻² Much of the attention has focused on the increased risks of suicide,³ even though most of the risk of excess mortality is due to physical health illnesses, such as cardiovascular disease, respiratory disease, and cancer.⁴⁻⁶ Excess mortality in people with mental illness is generally reported in

terms of standardised mortality rates and mortality rate ratios, but other measures can be used, such as potential years of life lost,⁷ average age at death, and life expectancy. As mortality rates in people with mental illness vary with time since onset of the disorder and age of onset, one disadvantage of using mortality rate ratios is that the composition of the cohort studied and the follow-up time can affect the outcome.⁸ Life expectancy can be a useful alternative. Because it is calculated by cumulating across all ages, life expectancy can reflect changes in mortality rates across ages. It also expresses the results in a metric that is intuitively easy to understand. Life expectancy is most commonly used to describe the mortality rates of geographically defined populations, but the technique has also been used for populations defined by demographic characteristics or diagnosis.

Of the few studies of life expectancy in people with mental illness, some have been restricted to inpatients and others to people with severe mental illnesses, such as schizophrenia and bipolar disorder. One study reported a reduction in life expectancy of 14 years for males and six years for females treated by the Massachusetts Department of Mental Health.⁹ Another study reported a reduced life expectancy in nine diagnostic groups from patients in contact with Swedish psychiatric clinics.¹⁰ More recently several reports on life expectancy in Nordic countries have been published, with the life expectancy of psychiatric patients reduced by 20 years in males and by 15 years in females compared with the general population.¹¹⁻¹² A group of patients with severe mental illness from a secondary care case register in London were found to have a reduced life expectancy of between eight and 15 years for males and 10 and 18 years for females.¹³ These were generally cross sectional studies and little is known about whether these benefits have extended to those with mental illness

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International classification of diseases codes used to define major causes of death

and whether the life expectancy gap between people with mental illness and the general population has changed over time. Although some research has shown that the mortality rate for people with schizophrenia has increased in the past three decades,^{14 15} only one study has examined this relation longitudinally using measures of life expectancy.¹² This study showed only a modest narrowing of the life expectancy gap in Denmark, Finland, and Sweden, countries with arguably some of the best and most equitably distributed healthcare in the world.¹⁶

We examined the mortality experience of psychiatric patients in Western Australia compared with the general population. Using a population based register of contacts with mental health services (including inpatient, outpatient, and community care based clients), we calculated trends in life expectancy among psychiatric patients compared with the total Western Australian population. We also examined causes of excess mortality in psychiatric patients and calculated the contribution of major causes of death to excess mortality rates, including cancer, heart disease, respiratory disease, and unnatural causes of death.

Methods

We extracted the data for this study from population wide databases covering the state of Western Australia. This state is well suited to population based record linkage studies because of its relative geographical isolation. The population of Western Australia increased from 1.4 million in 1985 to 2.02 million in 2005.¹⁷

Data sources

Mental health information system

The mental health information system records contacts with mental health services in Western Australia. This database started as a register of patients in psychiatric hospitals in 1966, and its scope was expanded in the 1970s to include all other hospitals and community mental health services. Since 1980 it has covered all inpatient admissions to private or public hospitals in Western Australia where a diagnosis of mental disorder or self harm has been made or where contact has occurred with a specialist psychiatric service, along with all outpatient and community based contacts with public mental health clinics.⁵

The system records basic personal data about each patient, including date of birth and sex, and service use data including dates of admission and discharge, periods of leave, and primary diagnoses. The register is comprehensive in its coverage of contacts with these services in Western Australia¹⁸; a validation study of selected diagnoses in the register found a high sensitivity and specificity for schizophrenia and affective psychosis diagnoses.¹⁹

Death registrations

All deaths occurring in Western Australia are registered by the registrar general. Cause of death is coded by the Australian Bureau of Statistics based on information provided on the death certificate or by the coroner's determination of cause of death. Cause of death was coded using ICD-9 (international classification of diseases, ninth revision)²⁰ until 1998 and then ICD-10²¹ from 1 January 1999.

Record linkage

The mental health information system and death registrations in Western Australia have been linked using probabilistic record linkage techniques as part of the Western Australian data linkage

system.²⁰ Because there are no unique identification numbers common to both datasets, probabilistic matching is undertaken using name, residential address, date of birth, and sex as the principal matching fields. Probabilistic linkage allows for the possibility of errors or changes in the identifying information used for matching. Once record linkage has been undertaken, deidentified linked files are provided to researchers and all analysis is undertaken on anonymised data. The proportion of invalid and missed links using this method has been estimated at 0.11%.²²

Measures

Principal psychiatric diagnosis

The mental health information system identifies mental disorders using codes: ICD-8 (international classification of diseases, eighth revision),²³ ICD-9-CM (Australian version of the international classification of diseases, ninth revision, clinical modification)²⁴ or ICD-10-AM (international statistical classification of diseases and related health problems, 10th revision, Australian modification).²⁵ ICD-9 was introduced in 1979, followed by ICD-10-AM in 2000. We identified hospital admissions and contacts with mental health clinics for mental disorders if an ICD-8 or ICD-9 chapter 5 diagnosis or ICD-10 chapter F diagnosis was made. For the purposes of this study, we excluded patients with all types of dementia, because of the typically older age of onset of this disorder. On the mental health information system, a separate diagnosis is recorded for each episode of care. Where patients have had multiple episodes of care, more than one principal diagnosis may have been assigned over the course of those admissions. We assigned a principal psychiatric diagnosis by using the most recent diagnosis subject to a hierarchy that gave preference to an earlier diagnosis if the later one was less informative or likely to refer to a comorbidity. Full details of this method are described elsewhere.⁵ Briefly, if the last episode of care recorded a diagnosis of alcohol dependence but a previous episode recorded schizophrenia, then we would assign a diagnosis of schizophrenia. This method was designed to give precedence to more severe disorders and to allow for certain conditions, such as substance dependence, to be considered as a potential comorbidity. We then grouped diagnoses into eight categories: alcohol or drug disorders, schizophrenia, affective psychoses, other psychoses, neurotic disorders, stress or adjustment reaction, depressive disorders, and other mental disorders. At this level, more than 70% of people on the mental health information system had only one diagnosis recorded.

Major causes of death

We coded deaths according to both ICD-9 and ICD-10. To ensure maximum comparability over time, we identified major causes of death using comparable ICD-9 and ICD-10 codes as recommended by the US Centers for Disease Control.²⁶ The supplementary table shows the ICD-9 and ICD-10 codes used to define each major cause of death. Cause of death is coded by the Australian Bureau of Statistics. Where there is more than one contributing cause of death, the disease or injury that initiated the train of morbid events directly leading to death is coded as the main cause of death.²⁷ Accidental and violent deaths are classified according to the external cause of death. Suicide is initially determined by coronial verdict. Where the coroner is unable to make a finding as to intent because of the high legislative standard for determining this or because of cultural or religious sensitivities, the Australian Bureau of Statistics undertakes further investigation of the death using information

on the national coronial information system and codes the death as a suicide where there is evidence of intent. Deaths where intent cannot be established are coded as other accident or injury.²⁸

Statistical analysis

Life expectancy

We calculated life expectancy at birth using the abridged life tables method as previously described.²⁹ The concept of life expectancy in any given year is based on what would be expected to happen to a hypothetical cohort if each individual was subjected throughout his or her life to the same age-sex specific mortality rates that were observed during that year. As such life expectancy does not refer to any specific individual, as mortality rates change over time.

The abridged life tables method uses mortality rates in a specific cohort within five year age groups to estimate life expectancy. This method is used by the UK Office for National Statistics to estimate life expectancy for regional areas owing to its suitability for smaller cohorts.^{30 31} To smooth out variability from smaller cohort sizes, we used deaths within five year periods rather than single year figures to calculate age specific mortality rates. For example, the life expectancy estimate for 1985 was based on deaths occurring in 1983-87, the estimate for 1986 was based on deaths occurring in 1984-88, and so on. As a result, although data were available from 1983 to 2007, the results presented in this study cover the period 1985 to 2005. Because of the small numbers of psychiatric patients under the age of 15 years, we assumed that the mortality rate in psychiatric patients before age 15 was equal to the mortality rate in the general population for that age group.

Mortality rates within five year age groups formed the basis on which we constructed abridged life tables. We calculate these mortality rates by dividing the number of deaths within the cohort within the appropriate age group and year span, by the total number of person years contributed by people in the cohort by age group and year range. For the eight disorder groups we calculated mortality rates and life expectancy at birth separately for males and females.

We compared life expectancy in the cohort of psychiatric patients with life expectancy at birth for the total Western Australia population, which is published by the Australian Bureau of Statistics.³² The bureau uses a moving three year average for calculating the mortality rates that underpin the population wide life tables.

As the mental health information system only started in 1966, and as life expectancy in the general population has increased and the nature of mental health service delivery has expanded with greater emphasis on community based care, the tendency has been for the proportion of the population with a history of contact with mental health services to increase over time. To tackle this problem we defined a cohort of "active" cases on any given date as people with ongoing contact with mental health services or who had contact with services in the five years preceding that date. This gave a more constant basis for observing changes in life expectancy over time. Therefore our primary cohort definition was based on people who had contact with mental health services in the past five years for each reference year. Within each five year window, we calculated person years at risk from date of first contact with mental health services if this date was within the past five years, or from the start of the five year period if first contact with mental health services was before that date.

Excess mortality by cause of death

We calculated the expected numbers of deaths in the cohort by major cause of death by using cause specific death rates by age group, sex, and time period for Western Australia obtained from the Australian Bureau of Statistics.³³ We applied these rates to the total person years in the cohort of psychiatric patients. We then calculated excess mortality by cause as the difference between the observed number of deaths and the expected number of deaths.

All analysis was undertaken using SAS software.³⁴

Results

Overall, 292 585 people were in contact with mental health services in Western Australia between 1983 and 2007, of whom 47 669 died in the same period. Table 1 shows the numbers of active cases and deaths in the first and last cohorts included in this study, those of 1983-87 and 2003-07. From the person years contributed by the cohort we calculated the age standardised prevalence of each mental health condition, as defined by contact with mental health services, and we estimated resident population counts for Western Australia from the Australian Bureau of Statistics.¹⁷ The active prevalence of disorder (proportion of the population in contact with mental health services in the preceding five years) increased over time for some disorders (fig 1), in particular affective psychoses and stress or adjustment reactions. The mental health information system is a population based case register of service contacts so these prevalence rates represent the active prevalence of having been treated for a psychiatric condition by mental health services in the previous five years. These increases in active prevalence may reflect changes in diagnostic practices or a greater focus on community based treatment options, which may result in larger proportions of the population coming into contact with services.

In the general population, life expectancy for males increased from 73.1 years in 1985 to 79.1 years in 2005 and for females from 79.3 years to 83.8 years (table 2). Among psychiatric patients, males and females with alcohol or drug disorders had the lowest life expectancy in 1985, and the gap in life expectancy exceeded 20 years at each time point. With the exception of females with stress or adjustment reactions, all disorders were associated with a significant gap in life expectancy throughout the study. For all mental disorders combined, the gap in life expectancy for males increased from 13.5 years in 1985 to 15.9 years in 2005 and for females from 10.4 years in 1985 to 12.0 years in 2005.

In terms of individual diagnoses, the gap increased for both males and females with adjustment reaction, affective and other psychoses, and depression (figures 2 and 3). The largest increases in the life expectancy gap were seen for people with other psychoses (14.8 to 22.7 years for males and 14.1 to 22.6 years for females) and stress or adjustment reactions (7.3 to 13.2 years for males and -0.2 to 9.3 years for females, table 2).

Overall, most excess deaths were due to physical health conditions, with cardiovascular disease (including stroke) the main cause of 26.2% of excess deaths in male psychiatric patients and 35.3% in female psychiatric patients, and cancer the main cause of 13.6% of excess deaths in males and 13.3% in females (table 3). Suicide was the cause of 16.6% of excess deaths in males and 10.1% in females. Other accidents and injuries accounted for another 8.1% of excess deaths in males and 7.0% in females.

Although suicides represented a larger proportion of excess deaths for patients with affective psychoses (46.4% of males and 27.4% of females), stress or adjustment reactions (53.3% of males and 33.5% of females), and other mental disorders (33.4% of males and 14.8% of females), physical conditions represent the majority of excess deaths for all psychiatric disorders. Cardiovascular disease was the main cause of a substantial proportion of excess deaths for all psychiatric conditions, but particularly for schizophrenia (31.8% of males and 46.3% of females), other psychoses (32.5% of males and 40.6% of females), and neurotic disorders (38.3% of males and 37.6% of females).

Discussion

Our study shows that the size of the gap in life expectancy for people with psychiatric disorders in Western Australia increased between 1985 and 2005, from 13.5 to 15.9 years for males and from 10.4 to 12.0 years for females. The majority of excess mortality was attributed to physical health conditions, such as cardiovascular disease, respiratory disease, and cancer. Although some studies have shown that the mortality rate has increased over time for people with schizophrenia,^{14 15} only one study, based on data from Denmark, Finland, and Sweden, has examined changes in the life expectancy gap over time for a wider range of psychiatric conditions.¹² In contrast with the Nordic study, which showed a slight reduction in the life expectancy gap, we found that the overall gap in life expectancy increased by 2.4 years for males and by 1.6 years for females between 1985 and 2005. Particularly large increases were found for both males and females with stress or adjustment reactions and with other psychoses. Given that the Nordic countries have some of the most comprehensive and equitable healthcare and social welfare in the world, our results may be more typical of the experience in other places. The increased gap is largely driven by increasing life expectancy in the general population rather than a reduction in life expectancy in psychiatric patients. While life expectancy in Western Australia is high among developed countries, the magnitude of increase in life expectancy between 1985 and 2005 in Western Australia is consistent with that seen in the United Kingdom, the United States, and many European countries.³⁵ By examining gaps in life expectancy rather than mortality rates and by revealing that these gaps have increased over time, the results of this study are significant in that they show that outcomes for people with mental illness have worsened since the 1990s despite increasing knowledge about the impacts of such illness.

The widest gap in life expectancy was seen in people with alcohol and drug disorders, and this gap of more than 20 years was maintained throughout the period of study. As we assigned a principal psychiatric diagnosis for each patient in this study, the category for alcohol and drug disorders did not include patients with another psychiatric diagnosis and a comorbid substance use disorder but only those with a primary diagnosis of a substance use disorder. Substance misuse is a well established risk factor for cardiovascular disease and many cancers, so it is not surprising that the majority of excess mortality was attributable to heart disease, cancer, and liver disease.

Our findings suggest that the gap in life expectancy between psychiatric patients and the general population is worse than that for other disadvantaged groups. For instance, for lifelong smokers—a population that receives considerable public health attention and intervention—life expectancy is around 10 years less than non-lifelong smokers.³⁶ The gap in life expectancy

between Indigenous (Aboriginal and Torres Strait Islander) and non-Indigenous Australians is approximately 12 years for males and 10 years for females.³⁷ While inequalities in the health experiences of Indigenous Australians have justifiably attracted substantial public investment,³⁸ little attention has focused on the mortality rates of people with mental illness in Australia, and there are few interventions designed to reduce the morbidity and mortality associated with common physical illnesses in people with mental illness.

Possible causes of poor health outcomes in people with mental illness

Apart from the increased risk of suicide with mental illness, most mental illnesses, although debilitating, are not direct causes of death. Traditionally, there has been a view that suicide and unintentional deaths were a major cause of excess mortality in people with mental illness, and the bulk of public efforts to reduce mortality in such people have been directed at suicide prevention.³⁹ Our data show that almost 80% of excess deaths in people with mental illness are due to physical health conditions. Important advances have been made in reducing the rate of mortality from common physical health conditions in the general population, such as heart disease, respiratory disease, and some cancers. It seems as if people with mental illness have not benefitted to the same extent from these advances.^{12 40}

Excess morbidity or mortality associated with mental illness is recognised as a complex multifactorial problem.^{40 41} Higher rates of substance use have been well documented in people with mental illness, including tobacco, alcohol, and illegal drugs,⁴²⁻⁴⁴ as well as a higher prevalence of unhealthy lifestyles, including poorer diets and less exercise.⁴⁵⁻⁴⁷ The side effects of drugs, particularly the metabolic side effects of antipsychotics, have also received considerable attention.^{48 49} Finally, inequalities in access to, and use of, healthcare are well documented.⁵⁰ All of these factors may have contributed to the overall substantial and widening gap in life expectancy for people with mental illness in this study. Socioeconomic disadvantage is also more common in people with mental illness and is associated with health risk behaviours and reduced access to healthcare.⁵¹ However, studies that adjusted for socioeconomic status still found significantly worse morbidity and mortality for people with mental illness,^{2 8} showing that social deprivation and disadvantage are not the sole determinants of poor health outcomes in people with mental illness.

Improving health outcomes for people with mental illness

As multiple factors contribute to worse health outcomes in people with mental illness, a range of solutions is required both to deal with health risk factors at individual patient level and to ensure equitable access to healthcare. To tackle systemic barriers to healthcare provision, a range of solutions has been proposed, including integrated care models such as co-location of physical and mental health services or the use of case managers or other liaison staff to undertake a coordination role between services.^{50 52} General practitioners also have an important part to play in managing the overall health needs of people with mental illness. Increasing access to screening and funding models that allow general practitioners to spend more time with patients with more complex problems may be advantageous.^{53 54} In terms of health risk factors at individual patient level, the use of peer supporters or provision of healthcare skills training may help people with mental illness manage their health.^{55 56} Improvements in risk factor profiles, such as reducing smoking, improving diets, and increasing physical activity, have

contributed to improvements in life expectancy in the general population. Adapting population health and health promotion approaches to more specifically target disadvantaged populations, including those with mental illness, could help extend these gains to population groups with multiple problems or disadvantages.⁵⁰ Major improvements in health outcomes for people with mental illness are unlikely without system wide commitment to achieving equality in health service delivery and access. This may require health systems committing to targets for improvements in outcomes, regular monitoring of progress, equitable allocation of resources based on health need, and the integration of the needs of people with comorbid mental health problems into mainstream healthcare and public health initiatives.⁵⁷ One example is Queensland's strategy to improve the physical health of people with severe mental illness (Activate: Mind and Body).⁵⁸

One researcher¹⁶ argued that the continued gap in life expectancy shows the poor value that society places on people with mental illness and that the lost years of life are viewed by society with "cynical disregard." Psychiatric patients in this study represented over 5% of the Western Australia population, including a large proportion of people who had only short contacts with services.⁵⁹ Although the pervasive stigma associated with mental illness may lead some to believe otherwise, many adults in this group have families, are employed, and would be expected to be making a contribution to their families and communities. The opportunity for them to do so is being foreshortened by premature mortality.⁶⁰ Addressing both the physical and mental health of people with mental illness would allow such people to participate more fully in society, including through increased employment opportunities and reduced absenteeism.

Limitations of this study

Limitations of this study include the reliance on administrative data of contacts with services. Not all people with mental illness have contact with services, and these data have to be considered representative of the population of people in contact with services, not all people with mental illness. For instance, the register does not cover people with undiagnosed and untreated disorders and those who are only treated by general practitioners or private psychiatrists and psychologists. People with disorders who are not in contact with services may have different mortality, and possibly worse, outcomes than those in contact with services. Changes in life expectancy over time could be influenced by changes in service delivery and diagnostic practices. As the overall prevalence of contact with mental health services has increased over time, however, and if it is assumed that the most severe cases at any point in time are most likely to receive treatment, the increasing prevalence would be expected to reduce the observed gap in life expectancy, not increase it, assuming that the most severe cases have the worst mortality outcomes. Because the mental health information system started at a fixed time, and to avoid change over time being biased by the accumulation of more and more cases, we used an active case definition—that is, people who had ongoing contact with services or contact within the five years before each reference date. Changes in cause of death coding over time could have affected the estimates of excess death by cause. For instance, HIV has been coded as a cause of death in Australia only since 1996, and this would lead to an underestimation of HIV deaths in our cohort. In addition, ICD-10 replaced ICD-9 for the coding of deaths from 1999 onwards. However, an analysis of time trends in causes of death published by the Australian Bureau of Statistics suggests that the introduction of ICD-10 had little impact on rates.²⁷ Furthermore, changes to

some ICD codes would not affect our findings that psychiatric patients in general, and in each psychiatric diagnostic group, experienced a large gap in mortality, and that the majority of excess mortality was attributable to physical health conditions, including cancer and cardiovascular disease.

Conclusions

In summary, these results show the substantial impact of mental illness on life expectancy in Western Australia. Mental illness is common and associated with large increased risks of morbidity and mortality. While strategies aimed at the prevention of suicides and violent deaths remain an important component of efforts to reduce excess mortality in people with mental illness, our results show that almost 80% of excess deaths are associated with physical health conditions. The most common causes of death in the general population—heart disease, respiratory disease, and cancer—are also the most common causes of excess deaths in people with mental illness. Because of the complex, multifactorial nature of these conditions, multipronged approaches will be required to tackle these inequalities, in the same way that multipronged approaches have been used to reduce the mortality associated with these common conditions in the general population. These strategies should include both individual and population based components. It is more challenging treating people with multiple concurrent problems, but it is likely that treating both physical health problems and associated risk factors in people with mental illness would result in improvements to both physical and mental health.

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Ethical approval: This study was approved by the Human Research Ethics Committee, Department of Health, Government of Western Australia.

Data sharing: No additional data available. Access to these and other data from the Western Australia Data Linkage System can be sought through www.datalinkage-wa.org/.

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What is already known on this topic

People with mental illness have a shorter life expectancy than the general population

What this study adds

The gap in life expectancy between people with mental illness and the general population of Western Australia increased between 1985 and 2005, particularly for people with stress or adjustment disorder, affective psychoses, and other psychoses

Significant gaps in life expectancy remained for other psychiatric disorders

The majority of excess mortality in people with mental illness was attributed to common physical health conditions such as cardiovascular disease, respiratory disease, and cancer

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Tables

Table 1 | Numbers of active cases and deaths in first and last cohorts included in study

Primary diagnoses	Males				Females			
	1983-87		2003-07		1983-87		2003-07	
	Active cases	Deaths	Active cases	Deaths	Active cases	Deaths	Active cases	Deaths
Alcohol or drug disorders	5198	438	8163	764	1665	95	4191	209
Schizophrenia	3440	228	8073	399	2733	182	5027	286
Affective psychosis	2995	130	8798	537	5402	160	14537	660
Other psychoses	1973	178	2753	531	1823	182	1941	456
Neurotic disorders	2732	97	4988	372	5153	129	8633	561
Stress or adjustment reaction	3918	67	9563	381	6032	44	13 673	312
Depressive disorder	3501	193	7630	719	6891	213	13 813	750
Other mental disorder	5312	79	17 888	444	3824	56	19 743	310
Total	29 069	1410	67 856	4147	33 523	1061	81 558	3544

Table 2| Life expectancy and difference in life expectancy for people in recent contact with mental health services in Western Australia 1985, 1995, and 2005, by primary psychiatric diagnosis and sex

Primary diagnoses	Years (95% CI)		
	1985	1995	2005
Males			
Western Australian population	73.1	75.4	79.1
Alcohol or drug disorders:			
Life expectancy	52.7 (51.1 to 54.4)	52.5 (50.8 to 54.2)	57.4 (56.0 to 58.9)
Difference	20.4 (18.7 to 22.1)	22.9 (21.2 to 24.6)	21.6 (20.1 to 23.1)
Schizophrenia:			
Life expectancy	58.6 (56.5 to 60.7)	60.0 (58.5 to 61.5)	62.7 (61.1 to 64.3)
Difference	14.5 (12.4 to 16.6)	15.4 (13.9 to 16.9)	16.4 (14.7 to 18.0)
Affective psychosis:			
Life expectancy	64.0 (61.7 to 66.3)	65.1 (63.3 to 66.8)	64.9 (62.9 to 67.0)
Difference	9.1 (6.7 to 11.4)	10.3 (8.6 to 12.1)	14.1 (12.1 to 16.2)
Other psychoses:			
Life expectancy	58.3 (54.5 to 62.0)	53.4 (50.5 to 56.4)	56.3 (54.2 to 58.5)
Difference	14.8 (11.0 to 18.6)	22.0 (19.1 to 25.0)	22.7 (20.5 to 24.9)
Neurotic disorders:			
Life expectancy	63.5 (61.2 to 65.8)	68.1 (66.0 to 70.3)	66.7 (64.7 to 68.8)
Difference	9.6 (7.3 to 11.9)	7.3 (5.1 to 9.4)	12.3 (10.3 to 14.4)
Stress or adjustment reaction:			
Life expectancy	65.8 (62.5 to 69.1)	65.9 (63.9 to 68.0)	65.9 (64.1 to 67.7)
Difference	7.3 (4.0 to 10.6)	9.5 (7.4 to 11.6)	13.2 (11.3 to 15.0)
Depressive disorder:			
Life expectancy	60.7 (58.7 to 62.8)	62.0 (60.0 to 64.0)	63.8 (62.3 to 65.3)
Difference	12.4 (10.3 to 14.4)	13.4 (11.4 to 15.5)	15.3 (13.8 to 16.8)
Other mental disorder:			
Life expectancy	62.5 (59.8 to 65.2)	68.8 (65.2 to 72.4)	65.7 (64.1 to 67.2)
Difference	10.6 (7.9 to 13.3)	6.6 (3.0 to 10.2)	13.4 (11.9 to 15.0)
All mental disorders:			
Life expectancy	59.6 (58.8 to 60.3)	60.8 (60.2 to 61.5)	63.2 (62.6 to 63.7)
Difference	13.5 (12.7 to 14.3)	14.6 (13.9 to 15.3)	15.9 (15.3 to 16.5)
Females			
Western Australian population	79.3	81.4	83.8
Alcohol or drug disorders:			
Life expectancy	55.4 (52.0 to 58.8)	57.3 (54.9 to 59.7)	63.1 (60.1 to 66.1)
Difference	23.9 (20.5 to 27.3)	24.1 (21.6 to 26.5)	20.7 (17.7 to 23.7)
Schizophrenia:			
Life expectancy	66.5 (64.2 to 68.7)	69.5 (67.9 to 71.1)	71.3 (69.3 to 73.3)
Difference	12.9 (10.6 to 15.2)	11.8 (10.2 to 13.5)	12.5 (10.5 to 14.5)
Affective psychosis:			
Life expectancy	72.1 (70.2 to 74.0)	73.3 (72.0 to 74.6)	73.9 (72.5 to 75.3)
Difference	7.2 (5.3 to 9.1)	8.0 (6.7 to 9.3)	9.9 (8.4 to 11.3)
Other psychoses:			
Life expectancy	65.2 (61.9 to 68.6)	58.9 (53.0 to 64.9)	61.2 (57.6 to 64.8)
Difference	14.1 (10.7 to 17.5)	22.4 (16.5 to 28.4)	22.6 (19.0 to 26.2)
Neurotic disorders:			
Life expectancy	71.0 (69.0 to 73.1)	76.7 (75.0 to 78.5)	74.1 (72.4 to 75.7)
Difference	8.3 (6.3 to 10.3)	4.6 (2.9 to 6.4)	9.7 (8.0 to 11.4)

Table 2 (continued)

Primary diagnoses	Years (95% CI)		
	1985	1995	2005
Stress or adjustment reaction:			
Life expectancy	79.5 (72.4 to 86.6)	80.4 (77.2 to 83.6)	74.5 (72.5 to 76.4)
Difference	-0.2 (-7.3 to 6.9)	0.9 (-2.3 to 4.1)	9.3 (7.3 to 11.3)
Depressive disorder:			
Life expectancy	69.1 (67.4 to 70.9)	72.7 (71.0 to 74.4)	71.3 (69.6 to 72.9)
Difference	10.2 (8.4 to 12.0)	8.6 (6.9 to 10.4)	12.5 (10.8 to 14.2)
Other mental disorder:			
Life expectancy	67.7 (63.6 to 71.9)	70.1 (66.9 to 73.3)	71.7 (70.0 to 73.5)
Difference	11.6 (7.4 to 15.8)	11.2 (8.0 to 14.4)	12.1 (10.3 to 13.8)
All mental disorders:			
Life expectancy	68.9 (68.1 to 69.6)	70.9 (70.3 to 71.5)	71.8 (71.2 to 72.4)
Difference	10.4 (9.6 to 11.2)	10.5 (9.8 to 11.1)	12.0 (11.3 to 12.6)

Table 3| Distribution of excess deaths in people with mental illness (percentage), by cause of death, sex, and primary psychiatric diagnosis

Causes of death	Primary psychiatric diagnoses								
	All disorders	Alcohol or drug disorders	Schizophrenia	Affective psychosis	Other psychoses	Neurotic disorders	Stress or adjustment reaction	Depressive disorder	Other mental disorder
Males									
Total No of deaths	8064	2142	1218	795	1457	511	487	1027	427
Expected No of deaths	3133	526	398	419	479	287	289	470	265
Distribution of excess deaths by cause:									
Ischaemic heart disease	14.4	13.7	16.2	16.0	13.4	24.7	4.2	15.8	6.1
Cerebrovascular disease	5.7	4.8	6.5	2.2	11.0	6.8	0.0	2.4	2.5
Other heart disease	6.1	4.8	9.1	3.0	8.1	6.8	4.6	5.1	3.6
Malignant neoplasms	13.6	17.0	8.9	1.7	17.9	12.9	14.0	15.9	0.0
Chronic obstructive pulmonary disease	6.4	6.7	5.8	5.8	5.4	8.5	2.2	9.8	5.0
Influenza and pneumonia	3.6	4.5	4.3	3.3	5.0	1.0	0.0	0.6	2.4
Diabetes mellitus	1.9	0.7	3.3	3.2	2.7	1.5	0.0	1.1	4.1
HIV	0.3	0.1	0.3	0.2	0.4	0.0	1.3	0.7	1.0
Chronic liver disease or cirrhosis	5.3	12.2	1.1	0.0	3.3	2.5	0.5	3.3	0.2
Kidney disease	0.9	0.6	1.3	0.3	1.5	0.8	0.0	0.5	0.7
Dementia	0.5	0.1	1.2	0.3	1.6	0.0	0.0	0.0	0.3
Alzheimer's disease	0.4	0.0	1.9	0.0	1.1	0.0	0.0	0.0	0.0
Other	15.3	18.2	11.8	10.2	17.4	11.0	8.9	14.1	19.1
Suicide	16.6	6.1	19.8	46.4	5.3	16.2	53.3	22.7	33.4
Homicide	0.6	1.4	0.4	0.4	0.2	0.0	0.1	0.3	0.0
Complications of medical or surgical care	0.2	0.1	0.5	0.5	0.1	0.4	0.4	0.1	0.0
Other accident or injury	8.1	9.0	7.5	6.5	5.4	6.9	10.6	7.7	21.5
Females									
Total No of deaths	6553	579	1066	988	1399	682	378	1177	284
Expected No of deaths	3125	103	399	546	561	479	283	619	135
Distribution of excess deaths by cause:									
Ischaemic heart disease	16.9	11.5	18.2	14.4	17.0	25.1	0.0	23.2	8.6
Cerebrovascular disease	11.3	7.4	18.3	7.3	16.6	8.1	0.0	6.4	5.3
Other heart disease	7.1	7.9	9.8	4.6	7.0	4.4	0.6	7.8	3.9
Malignant neoplasms	13.3	16.4	7.1	5.2	16.9	17.3	20.9	15.9	10.4
Chronic obstructive pulmonary disease	6.5	5.9	5.6	9.1	5.7	12.7	0.9	7.0	2.0
Influenza and pneumonia	2.5	3.2	3.0	2.6	3.7	0.0	0.0	1.8	2.1
Diabetes mellitus	2.7	3.1	4.0	1.8	2.9	0.4	2.2	2.2	2.4
HIV	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chronic liver disease or cirrhosis	3.2	13.2	0.8	0.0	1.5	2.6	7.7	1.6	4.4
Kidney disease	1.8	1.6	2.2	1.4	2.6	0.9	0.0	2.1	0.0
Dementia	1.0	0.4	3.5	0.2	2.0	0.0	0.0	0.0	0.9
Alzheimer's disease	0.7	0.0	3.3	0.2	1.1	0.0	0.0	0.0	0.5
Other	15.1	18.4	11.0	15.8	15.7	11.9	16.2	11.3	32.6
Suicide	10.1	2.1	7.1	27.4	2.9	8.3	33.5	11.8	14.8
Homicide	0.4	1.4	0.2	0.1	0.0	0.7	4.4	0.1	0.4
Complications of medical or surgical care	0.3	0.4	0.1	0.3	0.2	0.2	0.0	0.4	0.5

Table 3 (continued)

Causes of death	Primary psychiatric diagnoses								
	All disorders	Alcohol or drug disorders	Schizophrenia	Affective psychosis	Other psychoses	Neurotic disorders	Stress or adjustment reaction	Depressive disorder	Other mental disorder
Other accident or injury	7.0	7.1	5.7	9.5	4.0	7.2	13.6	8.2	11.1

Figures

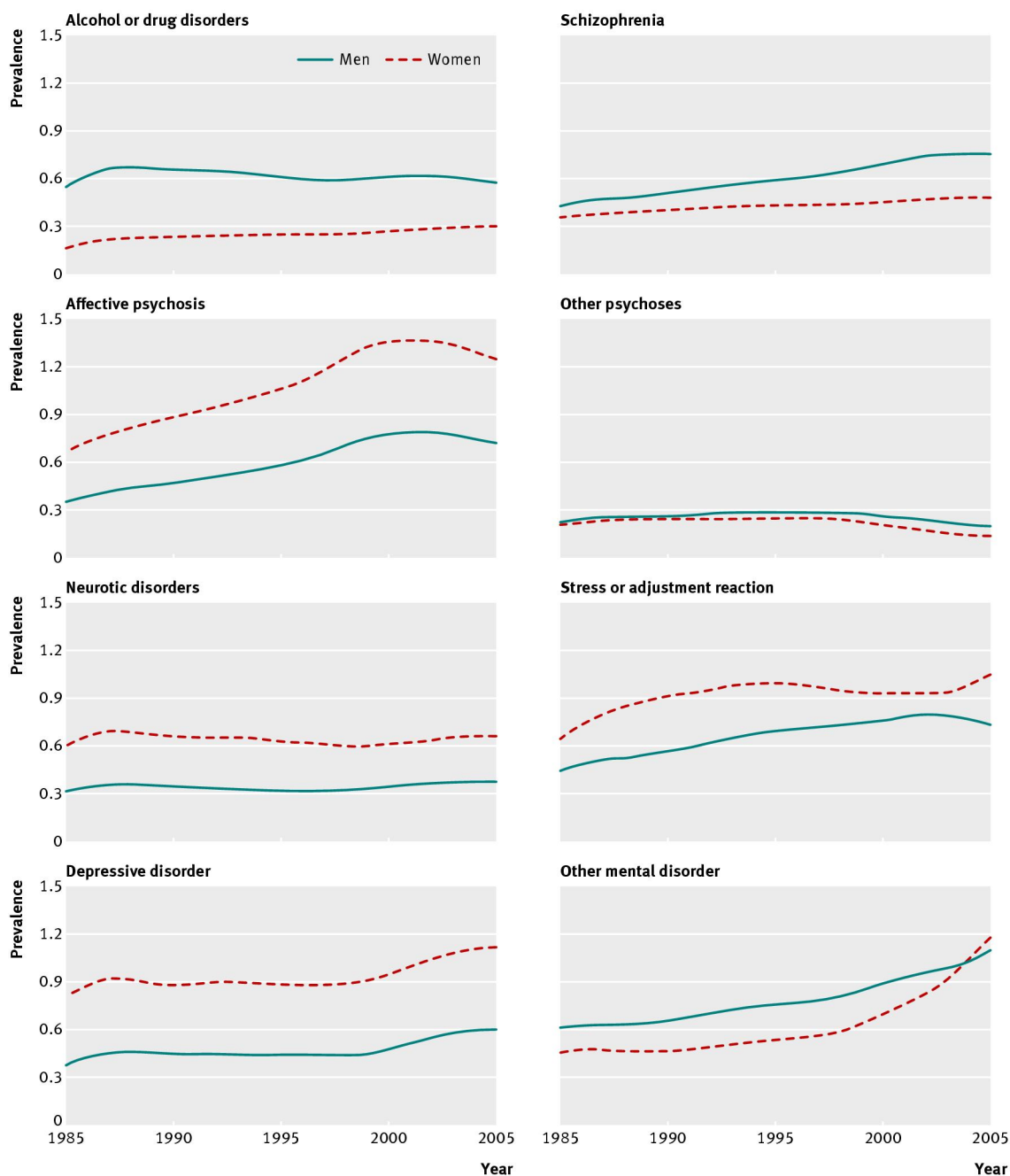


Fig 1 Active (five year) prevalence of mental disorders in people aged 15 and over, as assessed by contact with mental health services in past five years in Western Australia, by year and sex

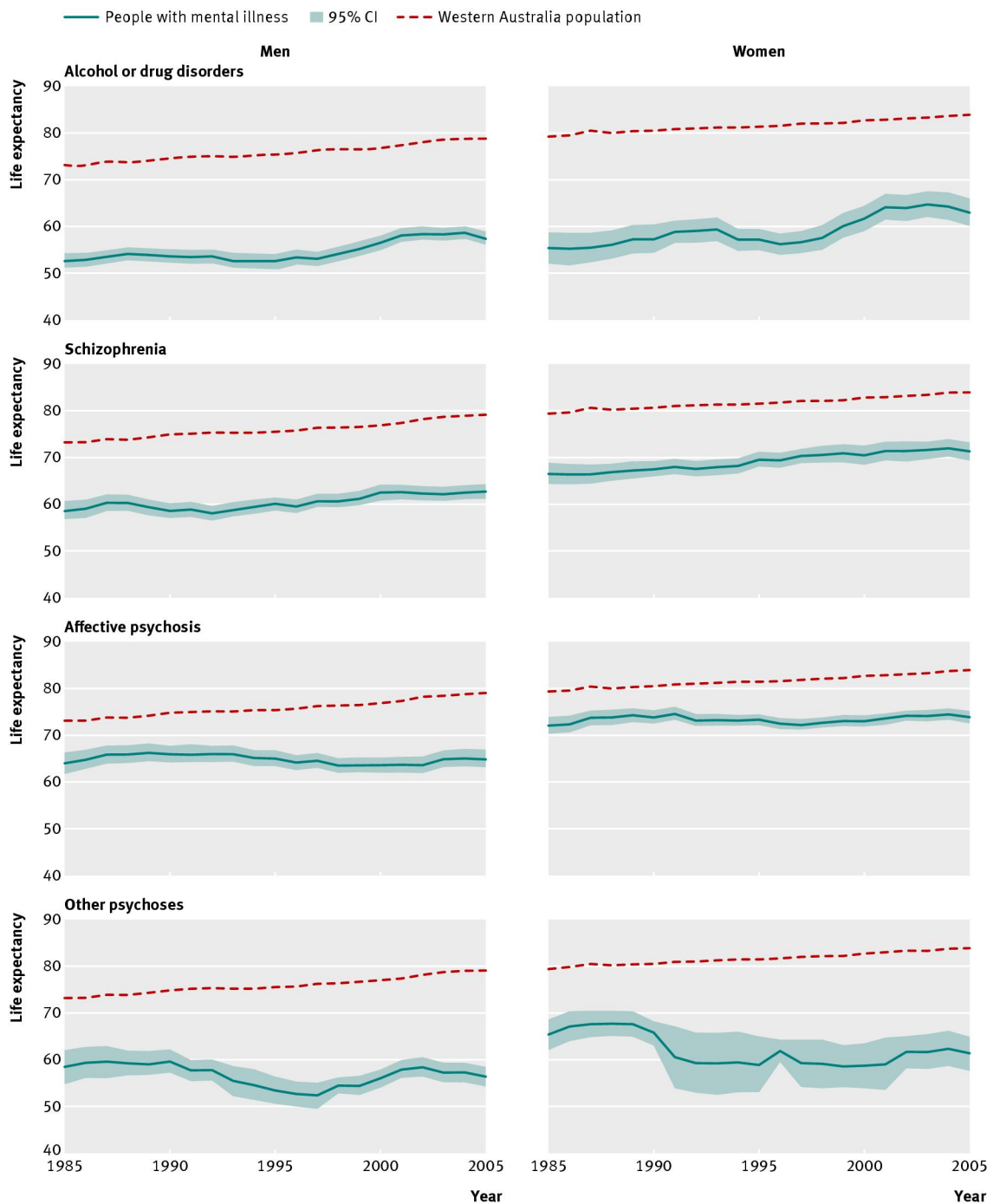


Fig 2 Life expectancy of people with alcohol or drug disorders, schizophrenia, and affective or other psychoses compared with the Western Australia population, by year and sex

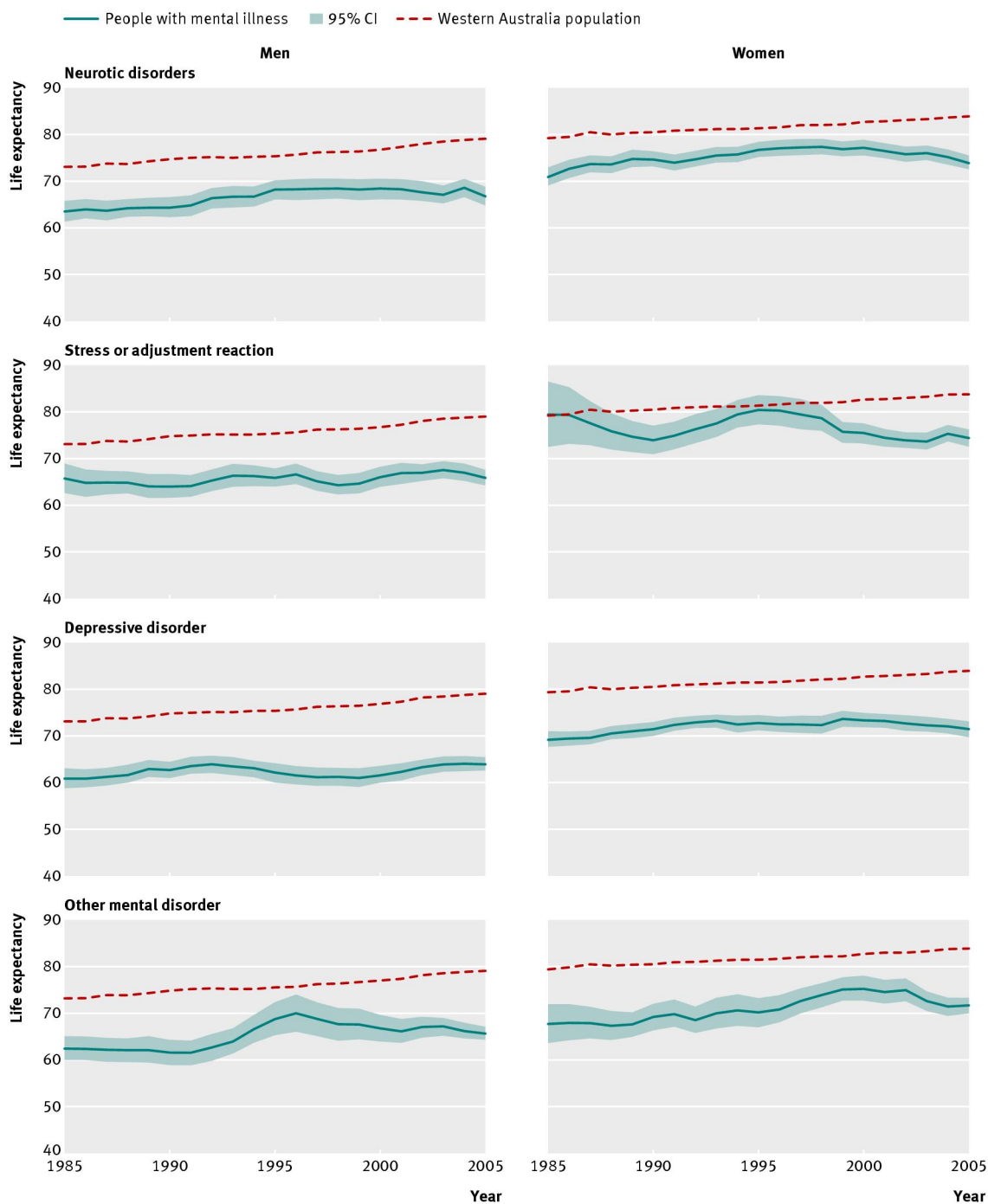


Fig 3 Life expectancy of people with selected non-psychotic mental disorders compared with the Western Australia population, by year and sex