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COLLABORATION

Australia's Mental Health and Physical Health Tracker

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August 2018

Harris, B, Duggan, M, Batterham, P, Bartlem, K, Clinton-McHarg, T, Dunbar, J, Fehily, C, Lawrence, D, Morgan, M & Rosenbaum S
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About the Australian Health Policy Collaboration

AHPC is an innovative Australian think tank working to improve health and reduce preventable chronic disease in Australia.

We work to inform and influence public policy and its practice with the aim of improving the health of Australians, in particular those from socio-economically disadvantaged communities.

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Foreword

I have had the privilege of working with people living with mental health conditions for many years. In the previous century I worked as a Minister in the Victorian Government that took great strides in de-institutionalising care and seeking to integrate services. I have worked with consumer and carer organisations, and was proud to serve as a National Mental Health Commissioner.

The objective of this new publication from the Australian Health Policy Collaboration, *Australia's Mental and Physical Health Tracker,* is to bring attention to the issues of higher risk factors and incidence of preventable chronic disease for Australians with mental health conditions.

More than four million Australians live with mental health conditions such as anxiety, depression or psychosis (1).

This report demonstrates that these four million Australians – many of whom are our friends, our family and our neighbours – are at much greater risk of chronic disease and much greater risk of dying an early death. Australian data show that the gap in life expectancy for people living with severe mental illness is approximately 10-15 years, and more than three quarters of the excess mortality comes from physical health conditions such as cardiovascular disease and cancer (2). Many of these early deaths are preventable.

In 2011, mental and substance use disorders were responsible for 12.1% of the total disease burden in Australia, disproportionately affecting younger and middle-aged people. Mental and substance use disorders were the third most burdensome category of disease, behind cancer and cardiovascular disease. These disorders were also the leading cause of non-fatal burden of disease, contributing almost a quarter (23.6%) of all years lived with disability (3).

This background paper discusses the data and information that was used to develop the *Australia's Mental and Physical Health Tracker* report card. It addresses more indicators than the report card and provides a brief context for both chronic disease risk factors and for co-occurring health conditions.

The paper also includes a brief discussion of where the data highlights areas for further action in academic and policy research.

Over decades of work to improve the lives of people living with mental health conditions, the most stubborn and heartbreaking problem I have come across is our collective failure to improve the life expectancy and physical health of people living with mental health conditions. Living with mental health issues can be hard, and a lot tougher when you add the burden of another chronic disease.

It my hope and expectation that clinicians, researchers, policy professionals, health funding organisations and consumers, their friends, families and advocates will use these data to improve the lives of people living with mental health conditions.

The Hon Robert Knowles AO,
Chair, AHPC Advisory Board

Australia's Mental and Physical Health Tracker

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The greatest mistake in the treatment of diseases is that there are physicians for the body & physicians for the soul, although the two cannot be separated.
- Plato

Introduction

Chronic and complex health conditions are now the predominant health burden for Australians, affecting education and employment, individual and family wellbeing. They contribute substantially to the cost of health care and have negative economic impacts.

There is a strong link between chronic physical and mental health conditions. Australian Bureau of Statistics figures show more than 2.4 million people live with both a mental health condition and a chronic physical health condition (1).

This paper contextualises and extends the data summarised in the *Australia's Mental and Physical Health Tracker* report card, published by the Australian Health Policy Collaboration, which provides a report card on Australia's performance in tackling the major risk factors for and high incidence of preventable chronic physical disease amongst Australians with mental ill health.

Scope

This paper address adult mental health conditions and physical ill health. This paper does not consider the growing evidence about comorbid mental and physical illnesses amongst children and young people or those associated with childbirth, medically unexplained symptoms or dementia, and other forms of cognitive impairment.

The data are disaggregated by gender to highlight the implications of the gendered dimensions of multimorbidity for future policy.

The paper concludes with a discussion of potential policy directions to lift the rate of progress in improving the health of people with mental and physical multimorbidities.

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Background

This paper and the *Australia's Mental and Physical Health Tracker* report card supplement the data presented in the Australian Health Policy Collaboration Report *Targets and Indicators for Chronic Disease Prevention in Australia* (2). These targets and indicators are Australian adaptations of indicators developed by the World Health Organization (WHO) within the scope of the *Global Action Plan for the Prevention and Control of NCDs*[1] *2013-2020* (3). Australia is a signatory to the Global Action Plan. AHPC brought together brought together experts from a variety of disciplines and specialities; they selected the Australian indicators to highlight the steps Australia needs to take to respond to the Global Action Plan and reduce the burden of non-communicable diseases by 2025.

Current evidence suggests that Australia is making slow progress – and in some instances is lagging behind other countries – in progress towards the WHO targets (4). Australia's lack of progress in relation to the risks of poor health amongst Australians in the lower two socio-economic quintiles is particularly evident. *Australia's Health Tracker by Socio-Economic Status* sets out the stark data on the unequal burden of chronic disease experienced by individuals affected by multiple forms of disadvantage (5). Over 10 million people are at much greater risk of poor physical and mental health than the rest of the population.

The AHPC trackers, cumulatively, provide a summary on progress in tackling chronic disease in Australia. It is clear that Australia could do better in preventing both chronic physical and mental health conditions, particularly amongst population groups and communities affected by disadvantage.

[1] Non-communicable diseases

Definitions and terminology

Chronic diseases

Chronic diseases (also referred to as non-communicable diseases or long-term conditions) have replaced infectious diseases and injuries as the major causes of disability and premature death in Australia and other developed countries (3, 6). Chronic diseases include a range of conditions that are long-lasting and diminish health status due to disease symptoms, functional impairment and disability, and can reduce healthy life expectancy and cause premature deaths. This paper applies a definition of chronic diseases which includes mental health conditions.

Multimorbidity

Multimorbidities are a growing concern worldwide, driven by population ageing and improvement of public health leading to lower mortality rates (7). Multimorbidity is commonly defined as the presence of two or more chronic medical conditions in an individual (8). However, multimorbidity has no single definition and is often given other names, including multiple morbidity and comorbidity (9). We have adopted the Academy of Medical Sciences' terminology for describing multiple chronic conditions; that is, comorbidity is the co-existence of other conditions with an index condition (for example, mental health) that is the specific focus of attention, and multimorbidity is the coexistence of several conditions, none of which is considered an index condition (9, 10).

Mental health conditions

The Australian Health Policy Collaboration recognises that the language used to describe mental health conditions – including disorder, illness, behavioural issues and other terminology – may cause confusion and distress to some people living with these conditions. The Australian Bureau of Statistics uses the term 'mental and behavioural issues' to describe their data. This report uses the term 'mental health conditions' when describing these data.

Mental health in Australia

The National Health Survey 2014-15 reported 4.017 million Australians (17.5% of the population) living with mental health conditions which vary in both severity and duration. The most common conditions reported in the survey were anxiety-related issues (11.2%) and mood disorders (9.3%), including depression (1). Less prevalent but often severe conditions include schizophrenia, schizoaffective disorder and bipolar disorder (11). Definitions of the conditions mentioned in this publication and the numbers of people affected are provided in the appendix *Notes on the data*.

From the 2007 National Survey of Mental Health and Wellbeing, it was estimated that 45 per cent of Australians aged 16–85 years had experienced a mental health condition in their lifetime (11). Overall, prevalence was higher for women than men across all ages. These figures are similar to those from other high-income countries (12).

Mental health conditions can vary in severity and be episodic in nature. A recent review estimated that 600,000 Australians (2–3% of the population) have severe disorders, as indicated by diagnosis, intensity and duration of symptoms, and degree of disability (13). This group includes people with psychotic conditions, who represent about a third of those with severe mental health conditions, and people with severe and disabling forms of depression and anxiety. Another 4–6% of the population have a moderate condition and a further 9–12% a mild condition (13).

Mental health conditions such as depression, anxiety and behaviours such as drug use are major causes of disability. Mental health conditions were the leading cause of the non-fatal burden of disease in Australia in 2011, estimated to be responsible for a quarter of the total non-fatal burden (6). In addition, in December 2017, more than 257,000 people in receipt of the Disability Support Pension had a primary medical condition of 'psychological/psychiatric' – more than a third of the people receiving this payment (14).

Improving the physical health of people with mental health conditions

People living with mental health conditions have consistently advocated for better physical health care. In recent years, the Australian Government and state and territory governments have prioritised physical health in mental health policy and planning documents.

Australia's National Mental Health Commission has partnered with a range of stakeholders to develop a national consensus statement, *Equally Well* (15). The consensus statement seeks to improve the quality of life of people living with mental illness by providing equity of access to quality health care, with the aim of bridging the life expectancy gap between people living with mental health conditions and the general population. The consensus statement has been endorsed by over 70 organisations (16).

Australian states and territories have increased their focus on physical and mental health policy in recent years. The Mental Health Commission of New South Wales has stated: "The chronic physical health problems and premature deaths of many people who experience mental illness are not acceptable" and produced an evidence guide to improve practice (17). The *Western Australian mental health, alcohol and other drug services plan 2015-2025* notes that:

> It is essential that mental health, alcohol and other drug services work together across primary care, community and hospital-based services and across health and human service sectors in an integrated, coordinated way to improve consumer, family and carer experience and outcomes. (18)

Victoria's 10-year mental health plan (19) and the mental health plans of Queensland (20), South Australia (21) and Tasmania (22) also note the importance of integrated services.

Meanwhile, Australia's mental health professional bodies are advocating for better integrated care for people with mental and emotional issues. The Royal Australia and New Zealand College of Psychiatrists (RANZCP) states:

> The RANZCP is seriously concerned about the inequalities in terms of physical health and life expectancy of people with serious mental illness compared with the rest of the population… These inequalities are exemplified by lower treatment rates for mental health conditions compared with physical health conditions, and premature mortality of people with mental health problems. The gap in treatment and outcomes between people with serious mental illness and others is inequitable and socially unjust. These poor outcomes also incur a range of avoidable social and economic costs to health care and welfare systems. (23)

The World Health Organization's *Mental health action plan 2013-2020* also puts a focus on comprehensive, integrated and responsive care, noting the need to attend to physical health care needs (24).

While most institutions are supportive of integrating and improving mental and physical health, the reality remains that care for the cohort of people living with comorbid mental and physical health conditions is often sub-optimal, both in terms of outcomes and efficiency.

A gap in life expectancy

People living with mental health conditions die earlier than the average Australian, and those with severe mental illness die 10–15 years earlier. More than three quarters of the excess mortality comes from chronic physical health conditions (25). Many of these early deaths are preventable.

Research on the life expectancy gap in Australia has focused on people who access psychiatric services, not the complete cohort of over four million Australians who report mental health conditions. Data on early deaths for the complete cohort are not available.

The data on life expectancy for people with severe mental illness comes from a Western Australian study of trends for psychiatric patients and the general population in that state (25). The data have been validated with comparable international studies (26), and accepted by Australian governments in setting policy directions (15, 17).

Most excess deaths (77%) were due to physical health conditions. Cardiovascular diseases and cancer were the two major causes of early deaths (25, 27), which are consistent with the leading causes of death for the general population in Australia (28). While mortality rates for these conditions have decreased significantly in recent decades (6, 29, 30), the relative outcomes for people with severe mental illness have worsened (25).

While caution is needed in extrapolating the gap in life expectancy for patients of psychiatric services to the complete cohort of Australians living with mental health issues, there is convincing evidence that mental health conditions are associated with shorter life expectancy (17, 26, 31-33), and that mental health conditions increase the risk of death for patients with other chronic health conditions (33-39).

The RANZCP has drawn on extensive evidence to outline the seriousness of this problem. It called for systemic, collaborative action between psychiatrists, other health disciplines, the pharmaceutical industry and governments to reverse “the culture of endemic low aspirations and system fragmentation” that contributes to these poor outcomes (23).

Major physical conditions for people with mental health conditions

About half of all Australians live with a chronic health condition, including circulatory diseases, mental health conditions, back problems, arthritis, asthma, diabetes, chronic obstructive pulmonary disease and cancer (1).

Chronic health conditions contribute most of the burden of disease in Australia. In 2011, 4.5 million life-years were lost due to premature death or living with illness. The leading four disease groups contributing to the most burden were cancer (19%), cardiovascular diseases (15%), mental and substance use disorders (12%) and musculoskeletal conditions (12%) (6).

More than five million Australians live with more than one chronic health condition (1). Multimorbidity is increasing in the general population, particularly amongst older people, women and those from disadvantaged backgrounds (9).

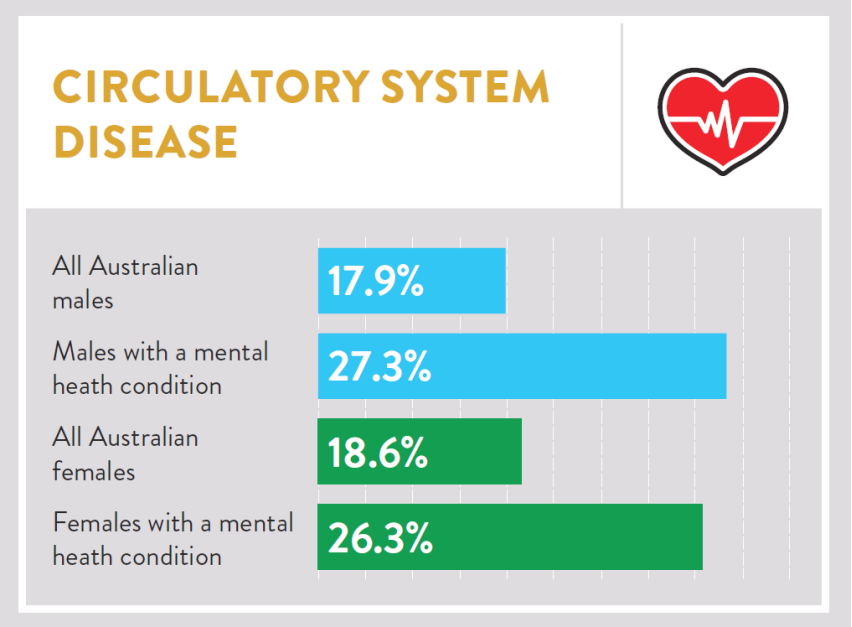
More than 2.4 million Australians live with a mental health condition and at least one other chronic health condition. People living with mental health conditions are much more likely than the general population to have another chronic health condition. An estimated 29.3% of this cohort are living with another chronic disease, and 30.5% are living with two or more additional chronic diseases (1). There is evidence that people who have both a mental and physical health condition report poorer general health and ability to partake in daily activities than those who have a physical or mental health condition alone (40, 41).

Data in this report were collected by the Australian Bureau of Statistics as part of the National Health Survey 2014–15, a stratified multistage area sample which included around 19,000 people in nearly 15,000 private dwellings. Definitions of conditions and links to the National Health Survey 2014–15 methodology are included in the appendix *Notes on the data*. To determine the association between mental and physical health conditions, we examined the prevalences of physical health conditions among people reporting mental health conditions and compared those data to the population as a whole. Data showing the major physical conditions affecting people with mental health conditions are presented and discussed below.

Circulatory diseases and mental health

Almost 4.2 million Australians live with a circulatory disease such as heart failure or hypertension. An estimated 1.075 million Australians live with both mental health conditions and circulatory diseases (1).

People reporting mental health conditions in the National Health Survey are much more likely to have circulatory system diseases than the general population. Men with mental health conditions are 52% more likely to report having a circulatory system disease, while women with mental health conditions are 41% more likely to report having a circulatory system disease.



Circulatory diseases are Australia's biggest killers. Ischaemic heart disease is the leading cause of death in Australia, with 19,077 deaths in 2016, or 12.0% of all deaths. Cerebrovascular disease, such as stroke, is the third-leading cause of death (28). Overall, cardiovascular diseases were responsible for 29% of all deaths in Australia in 2015 (42). The next most common cause of death is dementia, which shares many of the same risk factors. Coronary heart disease is the leading cause of burden of disease in Australia, and stroke is the eighth highest contributor (6).

Australia spends more on cardiovascular diseases than on any other disease group (43). The costs of cardiovascular diseases amount to over 12% of all health care expenditure. In 2011, cardiovascular diseases was the second most burdensome disease group in Australia, causing 15% of the total 4.5 million disability-adjusted life-years lost (44). In addition, there were over 1.1 million hospitalisations for cardiovascular diseases in 2015–16, 11% of all hospitalisations (30). Over 53,000 hospitalisations for heart failure could have been prevented, accounting for 15.3% of potentially preventable bed days (45).

Adults living in the lowest socioeconomic areas in Australia are more than twice as likely to have coronary heart disease as adults living in the highest socioeconomic area (46, 47). Migrants, people living in rural and remote communities, and Aboriginal and Torres Strait Islanders have significantly increased risk of both cardiovascular disease and dementia (48, 49).

There is a well-defined link between severe mental illness and cardiovascular disease. People with clinical depression, who are socially isolated or who have a lack of quality social support are at higher risk of cardiovascular disease. The risk of cardiovascular disease is 2–3 times higher for people with minor depression and 3–5 times higher for those with major depression (50). The existence of risk factors such as smoking and high blood pressure worsens the prognosis (50).

Co-occurring mental health issues complicate the treatment of cardiovascular and circulatory conditions, often leading to poorer outcomes and higher costs. For example, Carter et al. (2016) demonstrated that psychiatric comorbidities have a significant and clinically important impact on length of hospital stay for patients admitted with heart failure (51).

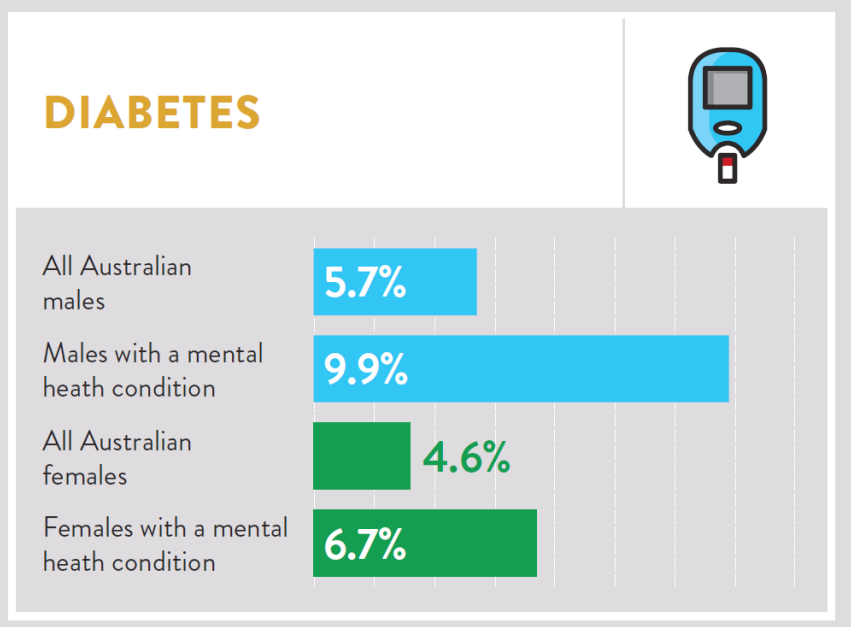
Quality of life is also affected. For example, an Australian study has demonstrated that co-occurring depression and cardiovascular disease leads to significantly poorer work outcomes, and employed people with these two conditions were eight times as likely to experience impairments in work function (52).

The modifiable risk factors for cardiovascular disease include high blood pressure, high cholesterol, smoking and physical inactivity. People living with mental health conditions are much more likely to exhibit the risk factors contributing to cardiovascular disease, and much more likely to be at risk of developing a circulatory condition. For people living with psychosis who participated in the 2010 Australian national psychosis survey, one quarter were at high risk for a cardiovascular event in the next five years on the Framingham risk equation or already had cardiovascular disease (53).

Whilst it is important to acknowledge that the incidence and prevalence of cardiovascular disease is decreasing in Australia and elsewhere in the developed world as a direct result of the actions already being taken to address the known risk factors (54), much more could be achieved (55). The Australian Health Policy Collaboration has recommended that Absolute Cardiovascular Risk Assessment be implemented for at-risk populations (56), which should include all people in the relevant age range, including people with mental health conditions.

Diabetes and mental health

Almost 1.2 million Australians live with diabetes mellitus. An estimated 321,400 Australians live with both mental health conditions and diabetes (1). Men with mental health conditions are 74% more likely to report having diabetes than the population as a whole, while women with mental health conditions are 46% more likely to report having diabetes.



Diabetes was the primary cause of 4,770 deaths in 2016, the seventh leading cause of death in Australia (28). However, diabetes is more likely to be reported as an associated cause of death than an underlying cause of death. There were 8,327 diabetes-related deaths in 2016, and 16,451 deaths where diabetes was mentioned on the death certificate and considered a contributory factor (28).

Diabetes was the second leading cause of death for Aboriginal and Torres Strait Islander Australians in 2016, with the standardised death rate five times that of non-Indigenous Australians (28).

Diabetes was also the 12th leading cause of burden of disease in Australia in 2011 (6). Over 40,000 hospitalisations for diabetes complications could have been prevented in 2013–14, accounting for 10.6% of potentially preventable bed days (45). A recent study in the United States concluded that the prevalence of depression among diabetic inpatients is increasing rapidly (57), and a separate study notes that patients with diabetes and depression have a greater risk of intensive care admission (58).

Diabetes is more than two and half times as prevalent in the lowest socioeconomic quintile than the top quintile, and more common in rural and regional areas than in major cities (1). Analysis of data from the Australian Aboriginal and Torres Strait Islander Health Survey 2012–13, adjusting for differences in age structure, found that Aboriginal and Torres Strait Islander people were more than three times as likely as non-Indigenous people to have diabetes/high sugar levels (59).

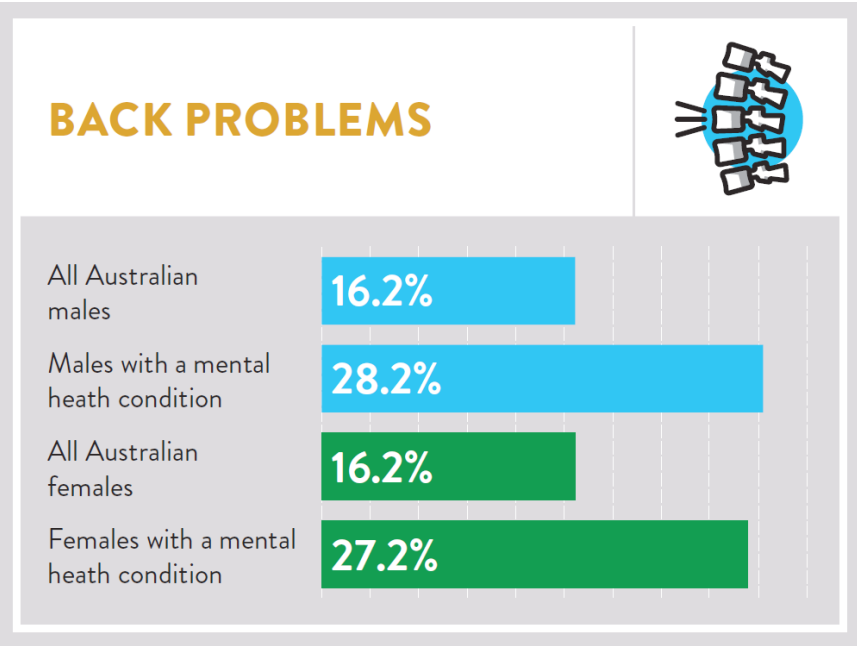
Katon et al. (2010) reported that people with diabetes and co-morbid depression had 36–38% greater risk of all-cause mortality over a two-year follow-up period (60). A systematic review from 2011 suggests that costs are higher for people with diabetes and mental health conditions, with findings of higher rates of hospitalisations, outpatient visits, emergency department visits and medication costs consistent with those from a retrospective study in the United States (61, 62). Co-occurring diabetes and mental health conditions also result in lower levels of physical and mental functioning than diabetes alone (63).

The second national survey of psychotic illness, conducted in 2010, found that people with a severe mental illness were more than three times as likely to report having been diagnosed with diabetes than the general population (53). These data are consistent with the findings of Holt and Mitchell (2015), who also noted that the consequences of diabetes mellitus are more severe and frequent in people with severe mental illness, with increased rates of microvascular and macrovascular complications, acute metabolic dysregulation and deaths related to diabetes mellitus (64).

The metabolic side effects of many psychoactive medications may contribute to higher rates of obesity and diabetes among people with mental health conditions (65-67).

Back problems and mental health

More than 3.7 million Australians live with back problems (or dorsopathies). An estimated 1.112 million Australians live with both mental health conditions and back problems (1). Men with mental health conditions are 74% more likely to report having back pain and women with mental health conditions are 68% more likely to report having back pain than the general population.



In 2011, back pain and problems accounted for 3.6% of the national disease and injury burden. In 2008–09, around 1.8% of total health-care expenditure in Australia ($1.2 billion) was attributed to back problems (68). There were over 171,000 hospitalisations due to back problems in Australia in 2015-16 (69).

Aboriginal and Torres Strait Islander peoples are significantly more likely to report back problems, particularly females (69). Men in inner regional and rural and remote Australia are more likely to report back problems than men in major cities, but this pattern is not evident for women (69). Australians in the two lowest socioeconomic status quintiles are more likely to have back problems than adults living in the highest two socioeconomic quintiles (69).

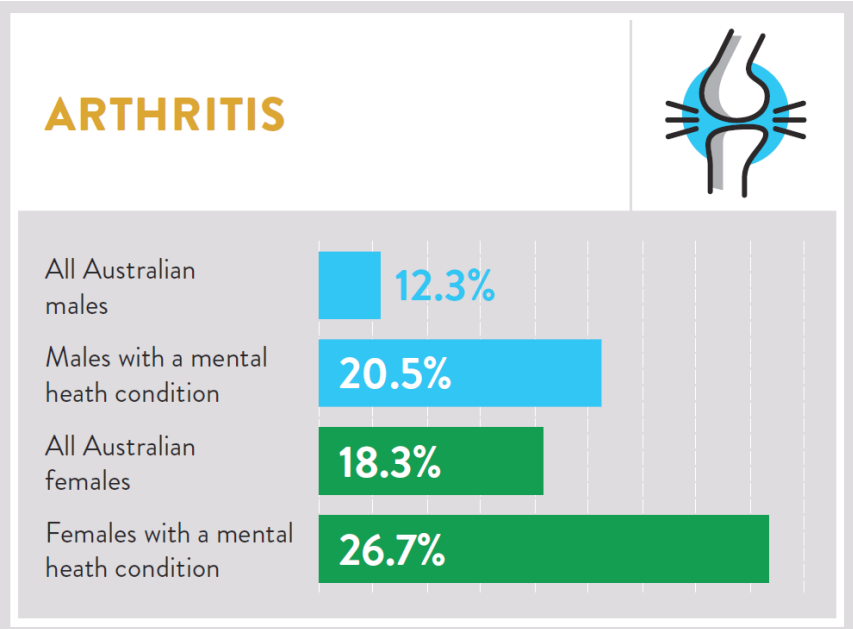
Unlike many other chronic health conditions, back problems affect a significant proportion of younger cohorts, affecting more than 2.8 million people aged 15–64 (69). This means that many people affected by both back problems and mental health conditions are of prime working age. There are over 468,000 people aged less than 44 years with both back problems and mental health conditions, with mental health conditions affecting 30.9% of people with back problems in this age group, while only 14.3% of people in this age group without back problems experience mental health conditions (70). The relationship between pain and mental health conditions may be bidirectional, with pain potentially linked to poorer mental health and poor mental health, increasing vulnerability to pain (71-73).

A literature review from Baumeister et al. (2012) notes consistent findings of increased direct costs in chronic back pain patients with mental disorders (74). Quality of life is also affected, as people with chronic back pain are more likely to report limitations and restrictions in relation to mobility, self-care, employment and social participation (68).

The 2010 Australian survey of psychotic illness found that almost a third of people with a severe mental illness reported having been diagnosed with chronic neck, back or other pain, and were more likely to report these conditions than the general population (53).

Arthritis and mental health

More than 3.5 million Australians live with arthritis, including osteoarthritis and rheumatoid arthritis. There are 959,000 Australians with both mental health conditions and arthritis (1). Men with mental health conditions are 66% more likely to report having arthritis, while women with mental health conditions are 46% more likely to report having arthritis than the general population.



In the Australian Burden of Disease Study 2011, musculoskeletal conditions (including arthritis and back pain) were ranked as the fourth leading contributor to burden of disease, and the second leading contributor to the non-fatal burden of disease (75). 'Other musculoskeletal conditions' (1st) osteoarthritis (6th) and rheumatoid arthritis (8th) are major contributors to the non-fatal burden of disease in Australia (ie. number of years lived with disability) (6). There were over 763,000 hospital separations in 2015–16 for diseases of the musculoskeletal system and connective tissue (76).

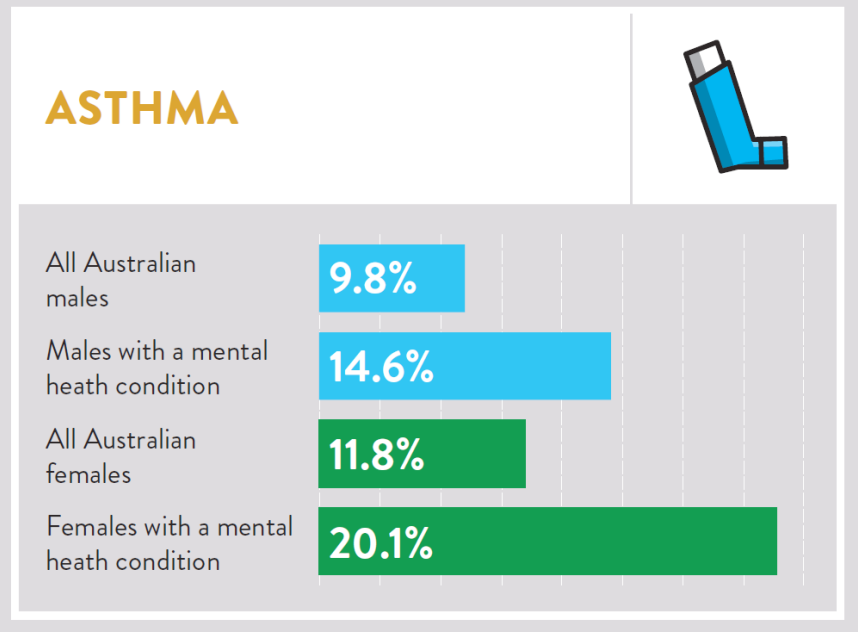
Arthritis is more common among the lower quintiles of socioeconomic status, and more common in rural and regional areas than in major cities (1).

Arthritis and mental health issues occurring together increase healthcare costs and decrease quality of life. As with back pain, the relationship may be bidirectional. Research from the University of Sydney suggests that anxiety/depression interacts synergistically with arthritis and neck/back disorders to increase the odds of reporting chronic pain beyond an additive model (77). Further, Australian data show that people aged 45–64 living with arthritis and depression are more than five times more likely to be out of the labour force than people with arthritis only (78).

The 2010 Australian survey of psychotic illness found that people with a severe mental illness were more likely to report having been diagnosed with arthritis than the general population (53).

Asthma and mental health

Almost 2.5 million Australians live with asthma, and 707,800 Australians live with both mental health conditions and asthma (1). Men with mental health conditions are 49% more likely to report having asthma, while women with mental health conditions are 70% more likely to report having asthma.



Asthma was responsible for 421 deaths in 2015 (79). Asthma was also the 11th leading contributor to the burden of disease in Australia in 2011, and the fifth contributor to the non-fatal burden of disease (6). While most chronic health conditions overwhelmingly affect adults, asthma was the leading cause of disease burden in males and the second leading cause of burden in females aged 5–14 years (80). In 2014–15, asthma was the principal diagnosis for 39,502 hospitalisations (80).

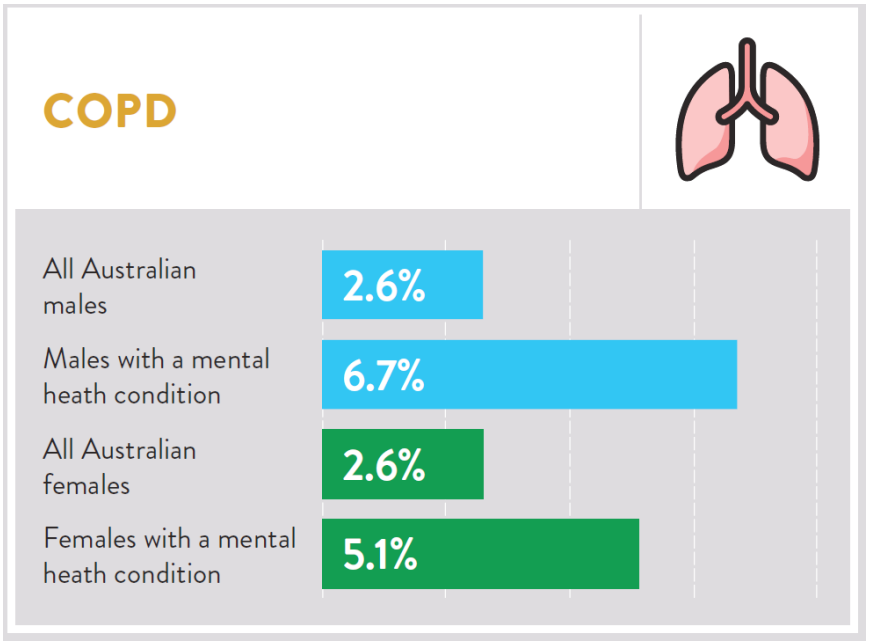
Asthma is more prevalent in lower socioeconomic groups, and more prevalent in rural areas than in major cities (79). After adjusting for differences in age structure between the two populations, Aboriginal and Torres Strait Islander people were almost twice as likely as non-Indigenous people to have asthma (59).

A recent analysis of primary care records in the United Kingdom reported that the mortality rate for individuals with comorbid asthma and depression was twice that among those with asthma alone (81). A systematic review of the literature by Hutter and colleagues (2011) notes a consistent meaningful impact of comorbid mental disorders on health care utilisation and costs in adult patients with asthma (82). Quality of life is also affected; for example, co-occurring asthma and depression are significant risk factors for work disability (83).

The 2010 Australian national survey of psychotic illness found that people with a severe mental illness were more likely to report having been diagnosed with asthma than the general population (53). Del Giacco et al. (2016) found a strong correlation between asthma and anxiety, with anxiety increasing the risk of asthma and of not being able to control asthma (84), with a recent Australian meta-analysis by Dudeney et al. (2016) showing that youth with asthma have a prevalence rate for anxiety that is more than three times higher than average, with over one in five youth living with asthma also living with anxiety (85).

Chronic obstructive pulmonary disease and mental health

6000,000 Australians live with chronic obstructive pulmonary disease (COPD), including bronchitis and emphysema. There are 227,700 Australians who live with both mental health conditions and COPD (1). Men with mental health conditions are 158% more likely to report having COPD, while women with mental health conditions are 96% more likely to report having COPD.



COPD is Australia's fifth leading cause of death, responsible for 7,714 deaths in 2015 (86). COPD was also the fourth leading contributor to burden of disease in Australia in 2011 (6).

In 71,828 hospitalisations of people aged 45 and over in 2015–16, COPD was the principal diagnosis (86). Over 60,000 hospitalisations in total for COPD could have been prevented in 2013–14, accounting for 15% of potentially preventable bed days (45).

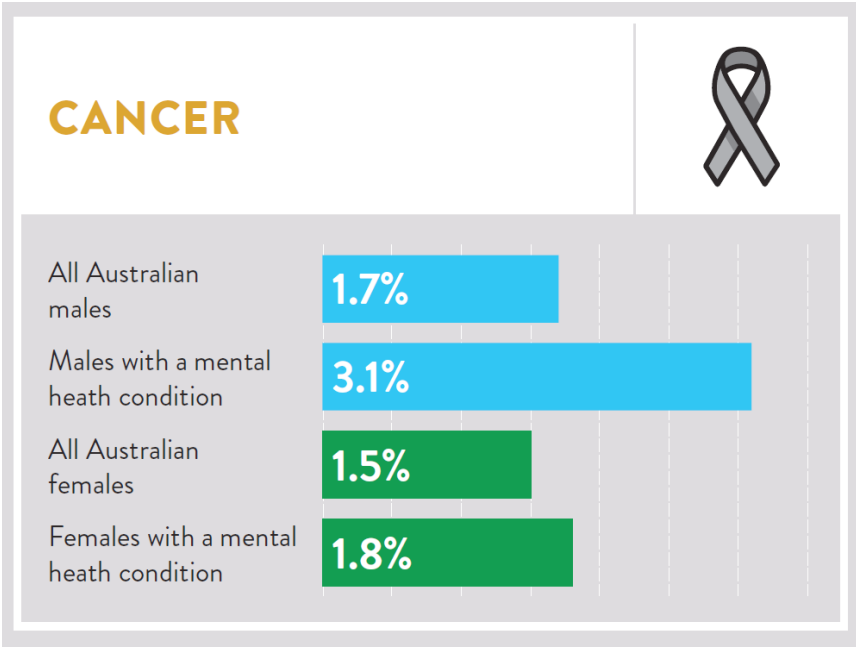
COPD is more than twice as prevalent in the lower two socioeconomic quintiles as in the top two quintiles, and more common in rural and regional areas than in major cities (1).

Together, mental health issues and COPD increase costs and decrease quality of life. German data suggests that psychiatric conditions substantially increase the direct costs of COPD treatment (87). A recent study of quality of life for people living with COPD noted the importance of mental health, suggesting that focusing on patient-reported outcomes and screening for depression and anxiety with potential successive treatment are promising approaches (88).

In 2011, three-quarters (75%) of the COPD burden was attributed to tobacco use (80) (see the section on tobacco below).

Cancer and mental health

An estimated 370,000 Australians live with cancer (malignant neoplasms), while 90,200 Australians live with both mental health conditions and cancer (1). Men with mental health conditions are 82% more likely to report having cancer, while women with mental health conditions are 20% more likely to report having cancer.



Cancers are among Australia's biggest killers, with 45,144 deaths in Australia attributed to malignant neoplasms (25,530 males and 19,614 females) in 2015 (28). Cancers contributed to over 330,000 years of life lost in 2016 (28). Happily, survival rates for cancers are improving, with some exceptions (29).

In 2011, cancer was the leading cause of disease burden in Australia, accounting for 19% of disability-adjusted life years (29). In 2014–15, there were 1,090,513 cancer-related hospitalisations, accounting for about one in 10 hospitalisations in Australia (29).

Like chronic physical health conditions, mental ill health affects cancer costs, treatment and outcomes (27). For example, depressed cancer patients incur significantly higher health care charges across multiple cost categories including ambulatory care, emergency department visits, and hospital visits (89).

Data from Western Australia show that people with psychotic conditions are no more likely to develop cancer than the population as a whole, even though they have higher exposure to risk factors such as smoking and obesity (27). The cohort in this study included people who have been treated in hospital for a mental health condition or in a specialist mental health facility, a more specific cohort than people living with mental health conditions (as surveyed by the Australian Bureau of Statistics. There is a negative correlation between schizophrenia and cancer evident from the literature (27). While this cohort was no more likely to develop cancer, they were more likely to die from cancer, with possible factors including lower screening rates and delays to diagnoses (27) and lower rates of surgical intervention (27).

Smoking is the major cause of cancer, with other modifiable risk factors including alcohol consumption, diet, and excess body fat and physical inactivity (90).

The consequences of mental and physical multimorbidity

Increasing burden of disease

The National Strategic Framework for Chronic Conditions (2017) notes that "chronic conditions are threatening to overwhelm Australia's health budget, the capacity of health services and the health workforce" (91). This is because "people with chronic conditions use health services and medicines frequently and over extended periods of time – a pattern exacerbated by the presence of multimorbidities" (91).

The scale of the challenge is significant, with more than 2.4 million Australians living with both mental and physical health conditions (1). Many of these people have three or more diseases, increasing the burden further still.

Multimorbidity is associated with decreased quality of life, functional decline, and increased healthcare utilisation, including emergency admissions, particularly with higher numbers of coexisting conditions (92-99). Adjustments for multimorbidity, especially involving mental health conditions, substantially increase estimates of disease burden (100) and impairment (101).

Increasing costs

The costs of healthcare for people with multimorbidities are generally higher (9, 98), with a European study suggesting cost increases of 28–40% (96). The costs of treating co-existing mental and physical conditions are significantly greater than the costs of treating the physical conditions alone (102). Moreover, the strong association between poor mental health and increased costs of care and treatment is broadly consistent across all levels of medical severity and persists even when adjusted for clinical and demographic variables (102, 103). There are, in addition, wider negative impacts of multimorbidity on family functioning, standard of living, child development and educational attainment (104).

The Victorian Institute of Strategic Economic Studies (2016) estimated the annual cost of premature death in Australia due to serious mental illness and comorbidity, beyond the personal and societal costs, at $15 billion (105). This figure includes costs relating to people living with severe mental illness (approximately 474,000 in this study), but excludes those associated with many of the 4 million Australians living with mental health conditions.

Reduced quality of life

People with both mental and physical morbidities have much worse quality of life than people with two or more physical health problems (41). People with two or more physical health conditions have high or very high levels of psychological distress compared with the rest of the population, with women with physical conditions reporting a greater prevalence of high psychological distress than men (106). Moreover, people with two or more health conditions were about twice as likely to have had seven of the last 30 days 'out of role' (work and/or personal) due to their health (106).

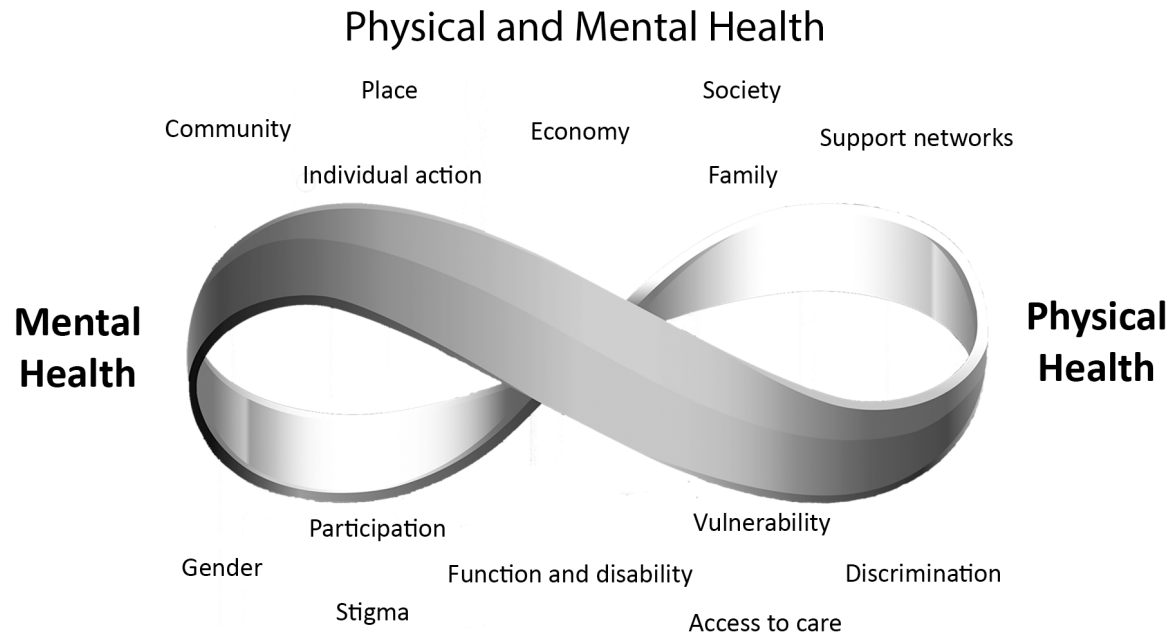
The World Mental Health Survey reports that mental health conditions are associated with higher individual-level disability than any of the wide variety of commonly occurring physical health conditions examined in parallel surveys, including arthritis, asthma, cancer, diabetes and heart disease. Comorbid mental health conditions can exacerbate functional disability (41). Mental and physical health problems together can have a greater effect on functional status and quality of life than physical illness alone (107-109). A significant part of the reason for these poorer outcomes is that a co-existing mental health problem may reduce a person's ability to actively manage their other health conditions (110, 111).

Patients with multimorbidity have a high treatment burden in terms of understanding and self-managing the conditions, attending multiple appointments, and managing complex drug regimens (112). Qualitative research highlights the "endless struggle" patients experience in trying to manage their conditions (113).

Mental and physical health: risk factors

Mental and physical ill health interact in the creation of comorbidities, with each being a risk factor for the other. There is strong evidence about the negative impact of mental health problems for people who already have chronic physical conditions, and there is equally strong evidence that a mental health problem (including depression or anxiety disorders) increases the risk of onset of a range of physical illnesses (114). For example, a review found that depression increases the risk of coronary artery disease and ischaemic heart disease by 50–100% (115). Similarly, a growing evidence base suggests that chronic stress has a direct impact on the cardiovascular, nervous and immune systems, leading to increased susceptibility to a range of diseases (116, 117). As a result of these associations, people with mental health conditions are more likely to die prematurely, principally from avoidable causes such as cardiovascular disease (25, 26, 33, 118).

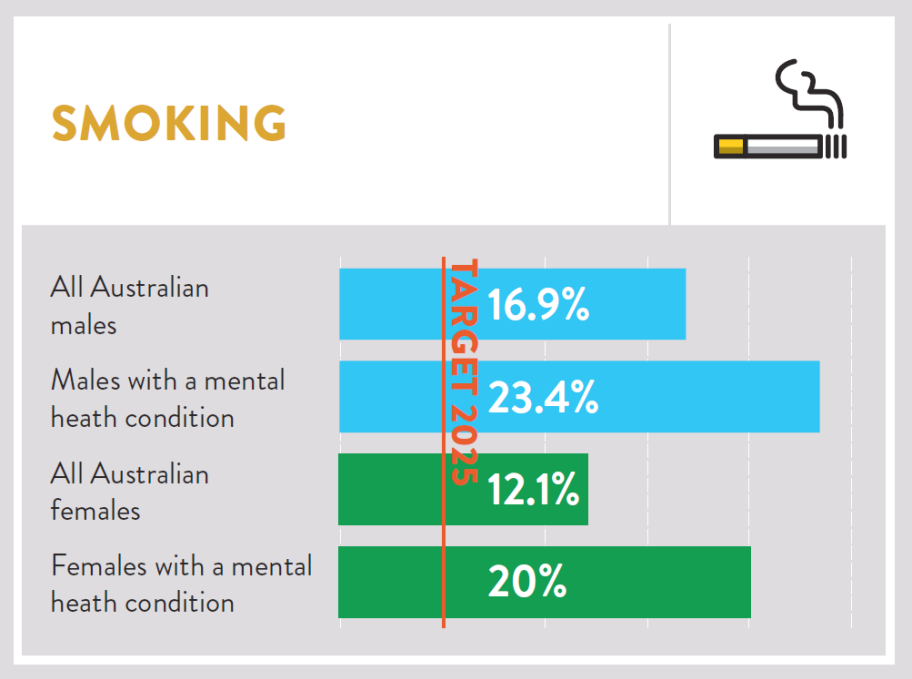
The relationship between mental and physical health is not well understood (ie. does physical ill health lead to poor mental health, or vice versa, or both?), although it is expected to be bidirectional (9). Evidence suggests that a combination of biological, psychosocial, environmental and behavioural factors is involved (119). Multiple causal factors interact at an individual and population level to influence the degree of disease burden, and unhealthy risks can be passed on through families, communities, and populations.



The prevalences of known risk factors for multimorbidities amongst people with mental health conditions are quantified below and compared to those for the Australian population. A significant proportion of chronic disease burden can be prevented or better managed by addressing these risk factors, including tobacco smoking, harmful levels of alcohol consumption, poor nutrition and lack of physical activity. Addressing these health behaviours can assist management of biomedical markers such as overweight and obesity, blood pressure and cholesterol. Each of these behavioural and biomedical risk factors influences chronic disease development. In addition to individual behaviours, risks of poor physical and mental health are strongly influenced by environmental, community and family factors.

Tobacco

Tobacco is a major risk factor for heart disease, cancers, musculoskeletal disorders and a range of other health conditions (120, 121)e. Overall, 12.8% of the population reports smoking daily (2). People reporting mental health conditions in the National Health Survey were much more likely to smoke than the general population. Men were 38% more likely to report smoking, while women were 69% more likely to report smoking than women in the general population.



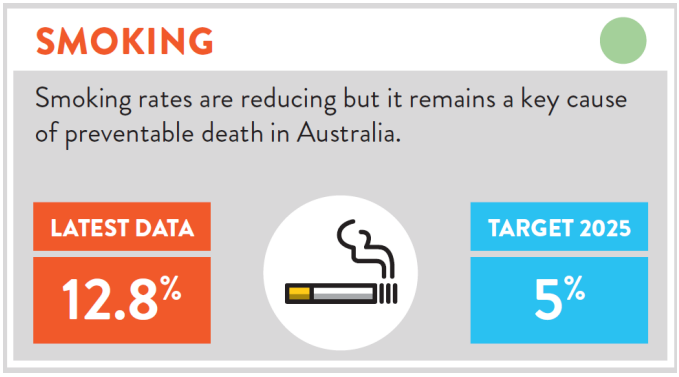
These population-level data are complemented by information from specific studies. For example, the 2010 Australian national psychosis survey found two-thirds (65.9%) of respondents were current smokers (males 70.3%; females 59.0%), consuming 21 cigarettes per day on average (122). In addition, Aboriginal and Torres Strait Islander people with a mental health condition are much more likely to smoke, with 46% reporting smoking daily compared to 33% of Aboriginal and Torres Strait Islanders with a physical health condition and 39% with no condition (123).

International reviews have consistently shown higher prevalence of smoking among people with mental health conditions, with smoking rates varying by diagnosis and setting. While high rates of smoking have been found among people living with depression (124), the highest rates of smoking are reported among people living with psychoses and substance use issues, and people accessing psychiatric inpatient services (125-127).

There are very few studies addressing risk factors specifically for people living with both mental and physical health conditions. In one Australian longitudinal study of mid-aged women, smoking was associated with increased psychosomatic multimorbidity over a 15-year period (including anxiety and depression) (128). In another study, Australian data from 2007–08 were used to demonstrate that people with diabetes who were current smokers were more likely to have a mental health condition and more likely to have medium, high or very high levels of psychological distress than people with diabetes who were not current smokers (129). Unlike in other sections of the population, smoking prevalence among people living with mental health conditions has not fallen, remaining relatively unchanged over the past two decades (130).

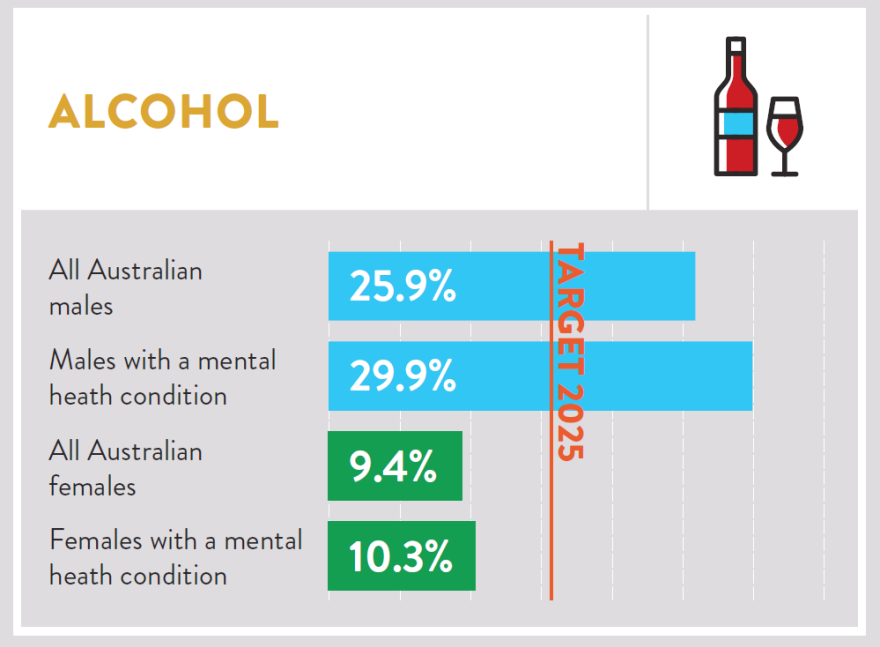
Quitting smoking can alleviate the effects of mental health conditions. A recent systematic review and meta-analysis by Taylor et al. (2014) demonstrated that smoking cessation is associated with reduced depression, anxiety and stress, and improved mood and quality of life compared with continuing to smoke. Taylor et al. found that the effect sizes from quitting are equal or larger than those of antidepressant treatment for mood and anxiety conditions (131).

Australia's Health Tracker recommends a target for the proportion of people in the population who smoke daily: 5% by 2025 (132).



Alcohol

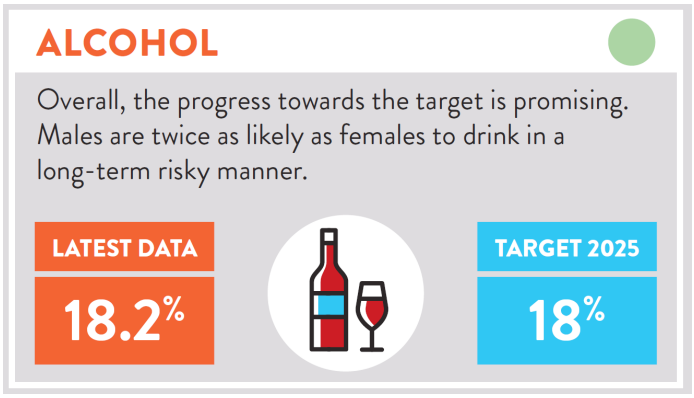
Risky drinking – reporting average alcohol consumption of more than two standard drinks per day over the past year – is associated with a range of injury risks, as well as chronic health conditions such as cancers, cardiovascular diseases, diabetes and musculoskeletal conditions (121, 133). An estimated 18.2% of the population reports risky drinking, with males twice as likely to report drinking in a long-term risky manner (2). People reporting mental health conditions in the National Health Survey were more likely to report risky drinking. Men with mental health conditions were 15% more likely to report risky drinking, while women with mental health conditions were 10% more likely to report risky drinking than the general population.



These findings are consistent with the high rate of comorbidity between mental health and substance use disorders (134). Half the participants in the 2010 Australian national psychosis survey had a lifetime history of alcohol abuse or dependence (122), a different measure than risky drinking.

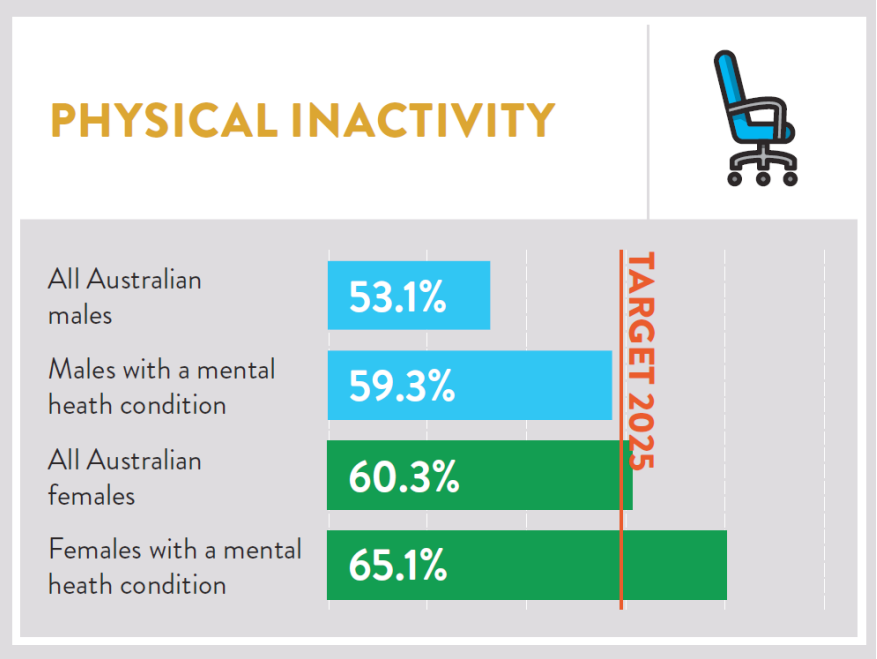
For Aboriginal and Torres Strait Islanders, rates of risky drinking for people with a mental health condition were similar to those for Aboriginal and Torres Strait Islanders without a mental health condition (59).

Australia's Health Tracker recommends a target for the proportion of people in the population who drink in a long-term risky manner: 16.1% by 2025 (132).



Physical inactivity

Physical inactivity is a risk factor for cancers, cardiovascular diseases, diabetes and musculoskeletal disorders (121). People reporting mental health conditions in the National Health Survey were much less likely to meet physical activity guidelines than the general population – meaning no or little exercise for fitness, recreation, sport or walking for transport in the last week. Men with mental health conditions were 11% more likely to report physical activity levels that did not meet guidelines, and the corresponding figure for women with mental health conditions was 8%.



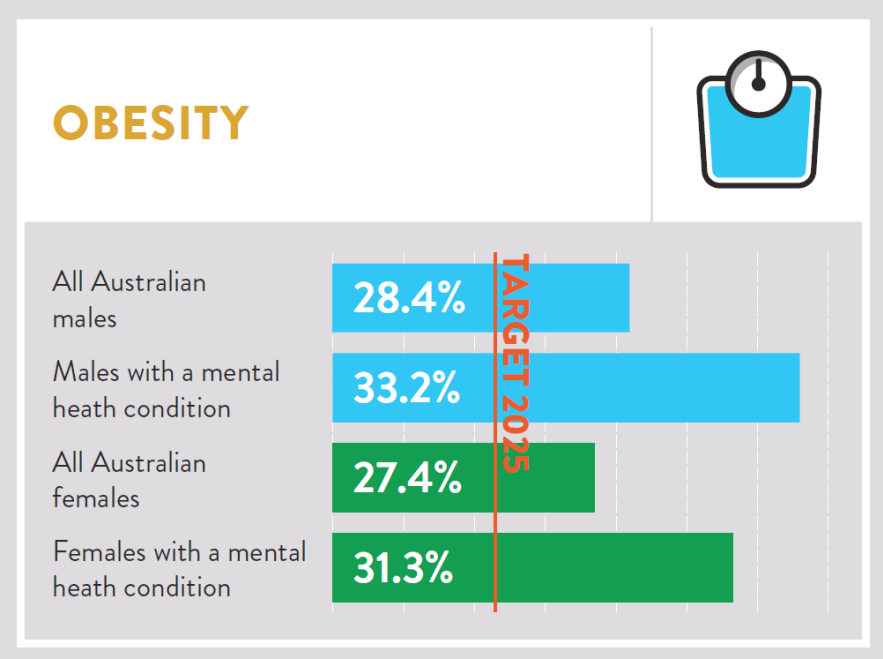
The 2010 Australian national psychosis survey assessed 33.5% of the cohort as sedentary in the seven days prior to interview (122). International systematic reviews and meta-analyses have also found more sedentary behaviour, less activity and lower fitness levels among people with severe mental health conditions (135-137).

In an Australian longitudinal study of mid-aged women, physical inactivity was associated with increased psychosomatic multimorbidity over a 15-year period (including anxiety and depression) (128). Conversely, there is sound evidence that physical activity is protective against the emergence of mental health conditions, including depression (138) and anxiety (139). Improved physical activity can also be an effective treatment component for mental health conditions (140-142).

Australia's Health Tracker recommends a target for the proportion of people in the population participating in no or low physical activity: 59.7% by 2025.

Obesity

Obesity is a risk factor for poor heart health, diabetes, musculoskeletal conditions and some cancers (56, 121, 143). Overall, 27.9% of the population report body measurements that classify them as obese (2). People reporting mental health conditions in the National Health Survey were more likely to be obese than the general population. Men with mental health conditions were 17% more likely to be classified as obese, and the corresponding figure for women with mental health conditions was 14%.

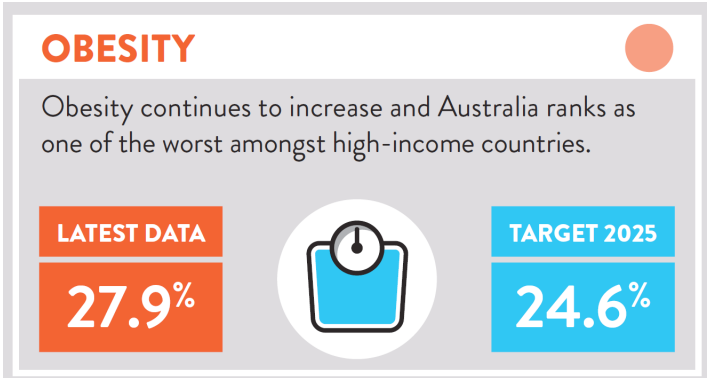


Interestingly, people living with mental health conditions are slightly less likely to be overweight than the general population, but much more likely to be obese (2).

Luppino et al.'s (2010) systematic review and meta-analysis of longitudinal studies found a reciprocal link between depression and obesity. Obesity was found to increase the risk of depression, and depression was found to predict development of obesity (144).

The 2010 Australian national psychosis survey found high rates of obesity among its cohort, at 45% (122). As previously noted, the side effects of many psychoactive medications may be a contributory cause (65-67).

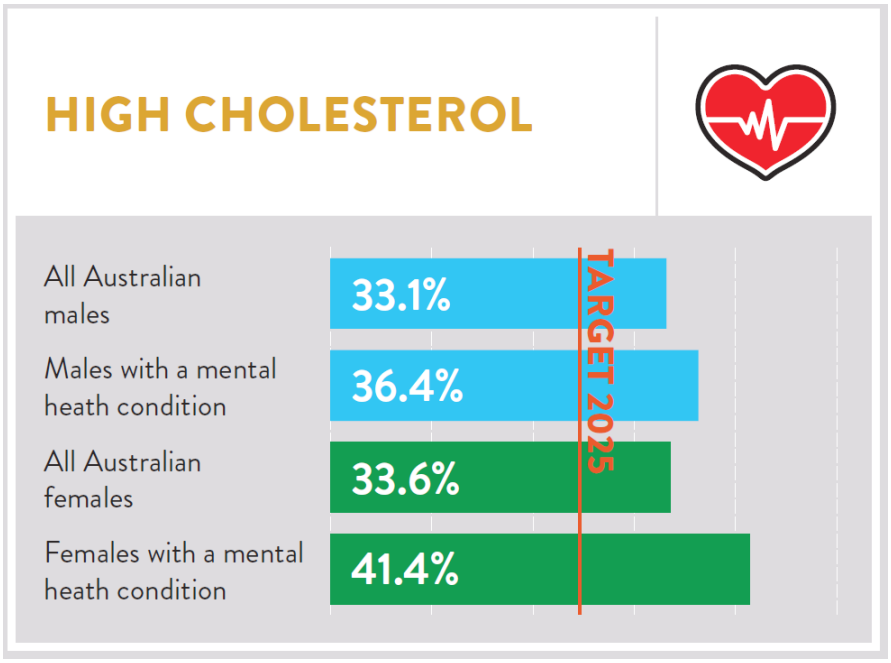
Australia's Health Tracker recommends a target for the proportion of people in the population who are obese: 24.6% by 2025 (132).



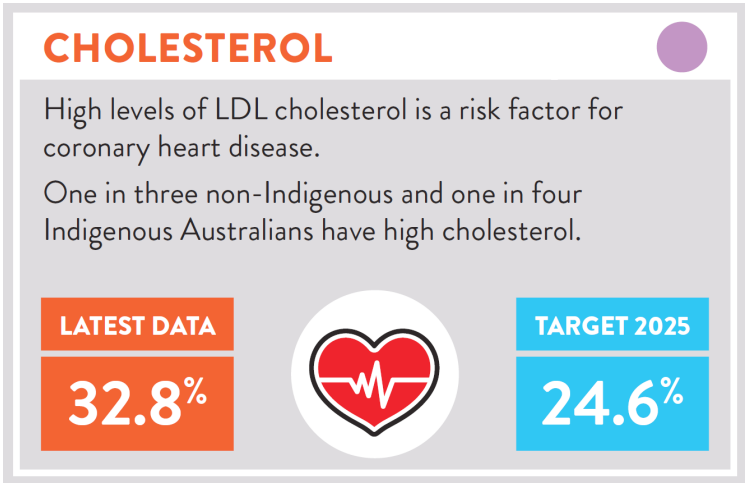
Cholesterol

High cholesterol is associated with poor cardiovascular health (56, 121). An estimated 32.8% of Australians have high cholesterol (145). People reporting mental health conditions in the National Health Survey were much more likely to have high cholesterol than the general population. Men with mental health conditions were 10% more likely to have high cholesterol, and the corresponding figure for women was 23%.

Note that the baseline for high cholesterol differs from other indicators (see *Notes on the data*).

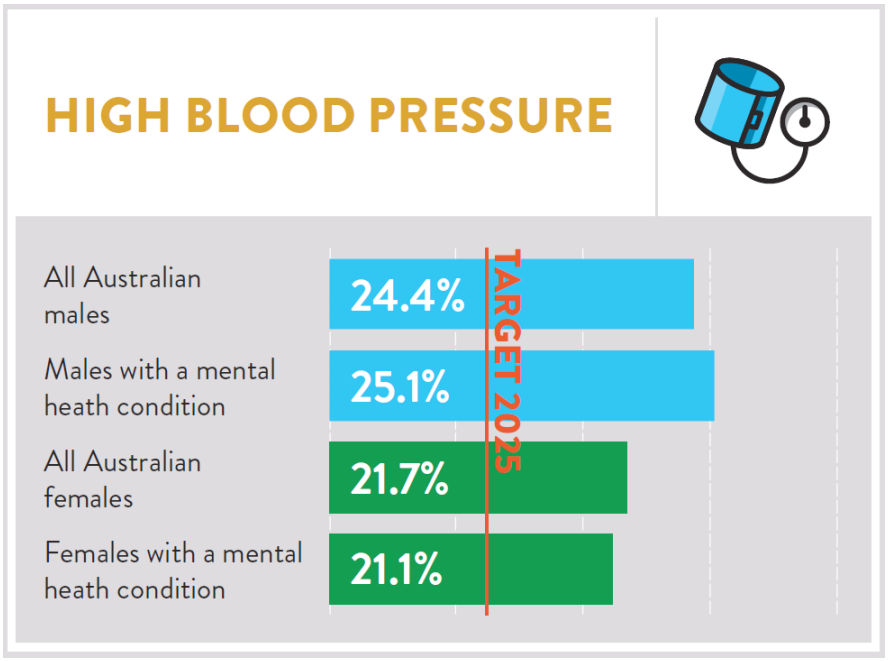


Australia's Health Tracker recommends a target for the proportion of people in the population with high cholesterol: 24.6% by 2025 (132).

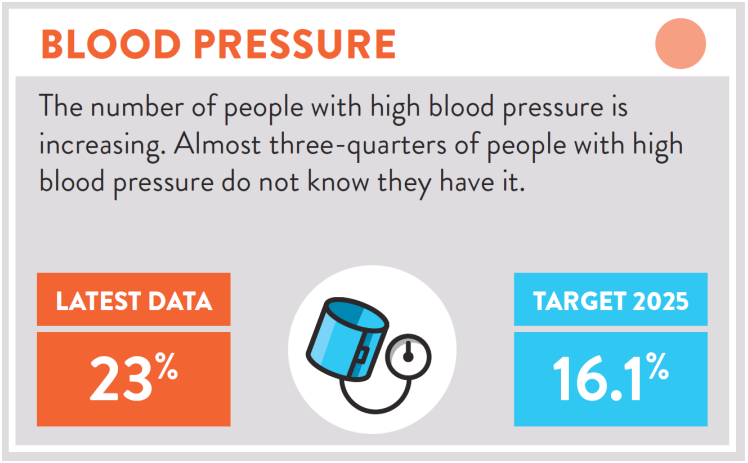


Blood pressure

High blood pressure is associated with poor cardiovascular health (146). An estimated 23% of the population has high blood pressure (2). Unlike other risk factors, the differences in prevalence of high blood pressure in the National Health Survey between people living with mental health conditions and the general population were small – slightly higher for men with mental health conditions, and slightly lower for women.



Australia's Health Tracker recommends a target for the proportion of people in the population who have high blood pressure: 16.1% by 2025 (132).



Tackling mental and physical health: policy and research challenges

The data presented in *Australia's Mental and Physical Health Tracker* are intended to inform consideration of policy and service options to improve the health of people living with, or at risk of, mental health conditions. High-level policy and practice-related actions that could bring about sustained improvements in the overall health and life expectancy for people with mental health conditions are suggested below, along with avenues for further research.

Transforming health systems to address multimorbidities

The impact of multiple chronic diseases is regularly identified as a challenge for Australia's health system (147), but the specifics of that impact are poorly understood by policymakers. Policy responses have been patchy and ineffective (148, 149).

Further, most health systems, including in Australia, are predicated on an historical single disease model (9, 150). A care provision approach based on single conditions does not reflect the reality of patients' health needs in the 21st century. The recent interim report from the Lord Darzi Review of Health and Care (2018) in the United Kingdom notes that:

> This transformation [increased multimorbidity] – part of the shift from acute to chronic illness – flips our definition of health on its head: aiming to achieve the absence of disease in this cohort of people is completely unachievable, instead we must focus on helping people to manage, adapt and make the most of life in the presence of chronic illness. (151)

These challenges were addressed in detail in the 2017 Productivity Commission report *Shifting the Dial*, which stated that "the patient experience of care receives little focus as a goal of the system. Notwithstanding the massive burden of chronic illness, its prevention and proper management is still in its infancy" (152). The 2015 report of the Primary Health Care Advisory Group proposed a series of reforms based on "the formalisation of the relationship between the patient with chronic and complex conditions and their Health Care Home: a setting where they can receive enhanced access to holistic coordinated care and wrap around support for multiple health needs" (153).

The Productivity Commission and the Primary Health Care Advisory Group both identified the importance of better targeting of services for patients with chronic and complex conditions. A risk stratification approach is needed to more effectively identify patients with high coordination and team needs and target services accordingly. The AHPC has similarly called for an integrated approach to tackling mental and physical health at individual, community and population levels (154).

Reforming healthcare funding

Health expenditure is increasing in Australia and internationally. The main determinants of increasing costs are population ageing, the costs of technologies and the burden of disease due to chronic conditions (152, 155, 156). These determinants are expected to persist and maintain the upward trend in expenditure over coming decades without radical action to address the structural issues with healthcare financing (152).

Despite the exponential rise in costs and the changing pattern of health and disease in the population, healthcare funding reinforces current health care structures and practices. Medicare, for example, was designed as a public insurance mechanism to manage one-off or episodic illnesses, based on a fee for service for each consultation. Medicare does not incentivise better management of multimorbid chronic disease, which requires continuing, integrated and coordinated care.

People with multiple conditions currently incur unnecessary costs within a fragmented system with services and providers working in isolation from each other, lack of continuity of care and treatment, and both wasteful duplication and gaps in services. These structural barriers militate against good outcomes for people with complex conditions who require proactive, long-term, coordinated, evidence-based management and team care. These outcomes represent a poor return on rising public and private investment in healthcare.

The AHPC previously has assessed health care funding models that are intended to better support chronic disease prevention and management. The AHPC has proposed that a mandatory integrated (public and private funding) health insurance market with regulated competition provides the best model for Australia given the characteristics of its mixed economy of health care provision. This model would provide the necessary components of a universal and sustainable health insurance model designed to provide for chronic health conditions and incentivise and reward practice change (157). Relying on fee-for-service medicine erects barriers to people with chronic health conditions (152), including mental health conditions.

Using health information better

Although Australia is party to the World Health Organization's Global Action Plan for the Prevention and Control of NCDs 2013-2020 (3), it does not yet have a minimum dataset for chronic diseases, including mental health conditions.

The low uptake of eHealth and other health technologies contributes to a lack of routine data collection that would allow policymakers to monitor outcomes, review performance and target interventions and funding (152, 153). The Productivity Commission has examined this issue in depth and recommended using data analytics to discover bottlenecks in integrated care systems, prospectively identify high-risk groups and identify the long-run effectiveness of preventive measures (152). In contrast, in Scotland for example, the available data allow for much better identification of people living with multimorbidity, the risk factors and intervention points (158).

The AHPC has worked with leading public health experts to review the suitability of the WHO 25x25 targets and indicators for Australian circumstances, and has produced a series of new targets and indicators which would enable a better understanding of progress – or the lack of it – in preventing chronic diseases and enabling better accountability for population health. Further effort is required to promote the importance of systematic monitoring of and reporting on these targets and indicators (2, 159).

A cross-sectoral approach

People with a mental health condition have contact with and receive care and support from a range of services and sectors including both public and private hospital services, primary care, private practices (including psychiatrists and psychologists), community health, and non-government (community managed) organisations (160). In addition to health-related support, people with a mental health condition may access services such as accommodation and employment support (161). Family members and carers also play a significant role, with approximately 2.4 million Australians (15% of the population) supporting a relative with a mental health condition (162). Improving the physical health and life expectancy for people with a mental health condition will require a cross-sectoral approach, utilising both health and non-health-related supports, and ensuring communication between sectors and strategies to ensure continuity of care.

Building capacity for prevention

The relatively low level of investment in prevention and treatment of chronic diseases in Australia ensures that there is little preventive capacity in the current system (121). Public health spending peaked at 2.22% of total recurrent health spending in 2007–08, and has declined significantly since. In 2013–14, spending on public health was only 1.34% of total recurrent health spending (163). Organisation for Economic Co-operation and Development data shows that Australia spends less on prevention and public health services than many other countries, including New Zealand (6.4%), Finland (6.1%), Canada (5.9%), Sweden (3.9%), the United States (3.1%) and Japan (2.9%) (155).

Action to close the life expectancy gap

Despite overwhelming evidence demonstrating a persistent gap in life expectancy between those with mental health conditions and the general population, there has been no widespread implementation of interventions to improve the physical health of people with mental health conditions (17, 164, 165). There is extensive evidence about the low priority accorded to mental health compared with physical health in policy and both generalist and specialist settings. This relates in part to funding. Investment in mental health services of all kinds has lagged behind investment in physical health. The RANZCP has drawn attention to the discrepancy between the burden of mental illnesses in the population (13%) and the fact that it receives only 7% of the treatment budget (166) and 8% of the research budget (167). However, whilst the level of funding is important, it is how the available funding is deployed that will be critical in improving outcomes (152).

Treatment risks

Extensive data suggest some treatments for mental health conditions can adversely affect physical health. Treatments for one disorder can, and often do, affect other systems in the body. People on long-term antipsychotic medicine, for example, can experience a range of metabolic disorders including weight gain, dyslipidaemia (elevated cholesterol) and diabetes (65-67). In a Dutch study of the six-year risk of cardiovascular disease in people with depression and anxiety, use of benzodiazepines was found to predict the risk of cardiovascular disease independent of psychopathological status (168). The RANZCP has published clinical practice guidelines for the management of schizophrenia and related disorders, including recommendations and guidance on the prescription of antipsychotic medications and the monitoring and treatment of side effects (169).

The management of multimorbidity with drugs is often complex, resulting in polypharmacy (multiple drugs being prescribed), with its attendant risks (170). Polypharmacy is known to create problems with adherence to drug regimens due to side effects that decrease quality of life, increased disorganisation, and high costs (8, 171). Researchers have highlighted opportunities to improve guidelines and support for discontinuing antidepressants (172).

Notwithstanding these data, screening for health risk factors and responsive and appropriate treatment is offered infrequently in many healthcare settings. The Lester Tool (173) is used in the United Kingdom to assist general practitioners and other primary health care workers to assess risk factors amongst people who are being treated with psychotropic medications, and defines levels and kinds of preventive interventions of physical health conditions. A version of this tool is also used in use in Australia for people prescribed psychotropic medication (174). This tool and other risk reduction mechanisms could be better used in a range of healthcare settings, including primary care.

Individual-level risk factors

The importance of addressing risk factors such as smoking (15), blood pressure, cholesterol, physical activity (175, 176) and diet (177) for people living with mental health conditions is well recognised. Australian research indicates that most mental health patients with risk factors such as smoking, physical inactivity and inadequate fruit and vegetable consumption are considering making improvements (178-180).

While receiving preventive care from mental health providers appears to be highly acceptable to people living with mental health conditions, there is a reported unwillingness or ambivalence from some mental health practitioners to address risk factors such as smoking among their patients (181-183) and the provision of such care is low (179, 184). Models tested in Australia and overseas can be effective in helping patients to make their lifestyles healthier (140, 185-187). For instance, brief models of preventive care could be provided routinely by all mental health providers, such as the 5As (ask, assess, advise, assist, arrange) (188-191) or AAR (assess, advice, referral to behaviour change supports) (192-197). Another proven strategy is to locate a designated practitioner/clinician within a mental health service to work with patients to help manage lifestyle and other physical health risks (198-202).

People living with mental health issues are less likely to be offered standard physical health checks and diagnostic tests (203), despite increased incidence of preventable physical health conditions. Promotion of regular diagnostic tests such as cancer screening or Absolute Cardiovascular Risk Assessment may be warranted for people living with mental health conditions.

Mental health providers, including primary care, are in a good position to address physical risk factors among their patients (25), but this is not embedded in practice. Efforts need to focus on understanding how to effectively implement existing, effective models of care into mental health services to ensure they are routinely provided to all patients (204).

People living with mental health issues are interested in improving their own physical health (184). Therefore, investing in promoting and supporting self-care and self-management may improve their risk behaviours, mental health and physical health (205).

Existing services that provide behaviour change support to the general population, such as Quitline, could benefit people with a mental illness, though may require some tailoring to best support the needs of this group (206-210). Research indicates that use of Quitline services among people with a mental health condition is high (206, 209, 210). While still effective, outcomes for this population are poorer than for Quitline users without a mental illness (206, 208-210).

Building the capacity of informal carers of people with a mental health condition to support healthy behaviour change should also be considered. Informal carers have been reported to play a key role in promoting positive health behaviours among those they support (211). Carers may require additional information, support and guidance from health and mental health services (212). Enhancing peer support networks, where people with similar health conditions can provide advice and support, may also be beneficial (213).

Stigma and discrimination

Extensive evidence shows that people with mental health conditions receive sub-optimal health care despite being at high risk for serious physical disorders (203, 214). There may be discriminatory and stigmatising attitudes amongst health care staff in a range of settings which inhibit help-seeking by people with mental illnesses and associated physical health needs (114). Inequalities in access to and outcomes of health care are evident in relation to general medicine and cardiovascular care but may also be present in cancer and diabetes care (215). One UK audit of physical health monitoring for people with serious mental illness found that a significant proportion of GP surgeries refused to cooperate when asked to undertake screening of patients who had been in the care of specialist mental health services for more than one month (216). Other research points to disparities in the health care delivered to people with and without severe mental and physical illnesses. Inequalities were most evident in relation to general medicine and cardiovascular care but were also present in cancer and diabetes care: the data show similar prevalence but poorer outcomes in people with severe mental and physical illnesses (217), including in Australian emergency departments (218).

People with both mental and physical illness can fall through the gaps between physical and mental health systems (105). When consumers with mental illness report physical health symptoms, all too often they are not addressed because clinicians focus on mental illness to the exclusion of other health problems or symptoms, a phenomenon called "diagnostic overshadowing" (219). Furthermore, some psychiatrists and others working in the mental health field do not recognise the treatment of physical symptoms as a key part of their role (114). Conversely, other doctors and clinicians lack confidence in managing physical health problems in people with mental illness. The result is that people with multimorbidities can miss out on essential health care services altogether.

Oral health

Oral health is essential for self-esteem, self-confidence and quality of life (220, 221). The AHPC recently published *Australia's Oral Health Tracker*, which showed the poor state of dental health in the community (222). People with serious mental illness are at greater risk of experiencing oral disease and have greater treatment needs that the general population (223, 224). Kisely (2016) has written on the two-way association between oral and mental health, arguing that there is "no mental health without oral health" (225).

A recent Australian study by Scrine and colleagues (2017) noted that mental health professions recognised the importance of oral health, but structural issues were barriers to referral. The barriers included perceptions of a heightened sense of fear and anxiety about treatment, lack of service integration, costs of care, and long public waiting lists. Many participants in the study spoke of clients whose poor oral health had reduced their sense of wellbeing, but when this problem was addressed experienced an immediate and often dramatic improvement (226).

Inequities in multimorbidity

Gender

The data show significant differences in the experiences of men and women living with mental health conditions in both risk factors and with correlated chronic health conditions.

A steadily increasing body of evidence reveals disparities between men and women in incidence, complaint presentation, symptoms and prognosis in many health problems, such as cardiovascular diseases, auto-immune disorders, HIV/AIDS and sexually transmitted diseases, and in the incidence, prevalence and experience of mental

ill health. Rapid progress in molecular biology has led to the discovery of a genetic and molecular basis for the biological, sex-related differences in these and other patterns of disease, including multimorbidity. However, these differences are not all reducible to biological factors alone; environmental factors are also crucial.

The AHPC recently published a policy paper – *Investing in women's mental health, strengthening the foundations for women, families and the Australian economy* (227) – which further explores gender issues in mental health.

Gendered distribution of comorbidities

Women are 23% more likely to have co-existing physical and mental health conditions than men. The gendered distribution of comorbid mental and physical health conditions from the National Health Survey 2014–15 (1) is illustrated below.

Mental health conditions and …	Women ('000s)	Men ('000s)	Odds ratio
Arthritis	593.1	369.7	1.60
Asthma	446.6	263.5	1.69
Back problems (dorsopathies)	602.6	509.3	1.18
Cancer (malignant neoplasms)	41.0	56.6	0.72
Chronic obstructive pulmonary disease (COPD)	113.8	120.4	0.94
Diabetes mellitus	148.3	177.7	0.83
Diseases of the circulatory system	582.7	492.3	1.18
TOTAL	**2,217.5**	**1,803.4**	**1.23**

Note that the totals in the table above refer to people living with mental health conditions and one or more chronic physical health conditions, thus are smaller than the sums of the columns. Women are also more likely than men to experience three or more conditions.

Socioeconomic disadvantage

There is strong evidence of a socio-economic gradient in the incidence of multimorbidity (158). The National Health Survey reported that mental health conditions are more likely in people:

- who live outside major cities (19%);
- in the lowest socioeconomic quintile (21.5%);
- who are not employed (36.5% of unemployed, 24.7% of people not in the workforce) ;
- who live alone (24.8%); and/or
- who have a disability causing a profound or severe limitation (52.3%) (1).

Further, at different life stages common risk factors and determinants have been identified. These include:

- exposure to adverse life events across the life course (228-231);
- risky health-related behaviours, including smoking (232), heavy alcohol use and physical inactivity (122);
- lack of adequate physical health status screening, monitoring and support (111); and
- strength of family and social networks (233).

Mental health and physical health multimorbidity is more common in less affluent communities (234). For example, in an Australian longitudinal study of mid-aged women, lower educational levels and difficulties managing on income were associated with increased psychosomatic (including anxiety and depression) multimorbidity over a 15-year period (128).

Further work on the life course of risk factors and multimorbidity is particularly important given that mental health conditions usually present before other chronic diseases (with the exception of asthma).

Aboriginal and Torres Strait Islanders

Whilst data on multimorbidity in Aboriginal and Torres Strait Islander communities are not readily available, there is evidence of high prevalences of mental health issues and psychological distress amongst Aboriginal people and Torres Strait Islander population groups. Twenty-nine per cent of Aboriginal and Torres Strait Islander people reported a mental health condition in the 2014–15 National Aboriginal and Torres Strait Islander Social Survey (34% of females and 25% of males) (123). Aboriginal people and Torres Strait Islander people with a mental health condition were almost three times as likely to have experienced high or very high psychological distress levels as those who were living with other long-term health conditions (123). It is estimated that potentially avoidable deaths amongst Aboriginal and Torres Strait Islander people are over three times higher than for non-indigenous Australians, and chronic diseases are major contributors to this burden (235).

Extending the evidence base about causality

The data on multimorbidity presented in this report are associative, and most studies on mental and physical multimorbidities similarly come from cross-sectional studies (9). Research on the causes of multimorbidity is scarce – in particular, we generally do not know how physical morbidity affects mental morbidity, or vice versa (9).

Mental health conditions are relatively common in children and young people (8.9% for 0–14-year-olds, 19.4% for 15–24-year-olds) (1), while most other chronic health conditions (other than asthma (79)) are relatively rare in younger age groups. The incidence of mental health issues in younger age groups, combined with the strong correlations between poor mental health and other chronic health conditions in middle and older-age groups, suggest the hypothesis that preventing or better managing mental health conditions for younger people could be protective against chronic diseases later in life. The incidence of chronic physical illness increases with age, and it is evident that good mental health is protective against chronic diseases in older people (236).

Further research on causation is needed to accurately target interventions that address common risk factors and to prevent second, third and subsequent diseases developing.

Conclusion

The evidence comprehensively demonstrates that people living with mental health conditions have worse physical health and a higher prevalence of chronic disease, and that a significant proportion die earlier than the rest of the population.

National and international evidence suggests that meeting the psychological and mental health needs of people with concurrent physical health conditions improves both physical and mental health (175). Despite this, mental and physical multimorbidities are often undetected, and even when detected, care and support for both physical and mental health is often uncoordinated and ineffective (111, 237). The RANZCP has drawn attention to pervasive and persistent inequalities in health and reduced life expectancy of people with severe mental illnesses, highlighting the need for high-level commitment to action from all levels of government, health systems and health professionals (23). The RANZCP makes recommendations including incorporating health promotion programs such as smoking cessation and weight management as core elements of mental health service delivery, and proactive screening and lifestyle interventions aimed at preventing and managing chronic conditions. There is a need to improve implementation of such care routinely and systematically into all services that support people with a mental health condition.

Implementing Absolute Cardiovascular Risk Assessment for all Australians over 45 years (over 35 for Aboriginal and Torres Strait Islander people) is a key step in addressing preventable chronic disease and early death (56). The data demonstrate that people living with mental health conditions would disproportionately benefit from implementing Absolute Cardiovascular Risk Assessment.

The scale of physical and mental health multimorbidity suggests that regular mental health assessments in primary care for people with chronic physical conditions, as currently recommended by the Royal Australian College of General Practitioners (238), should be promoted and supported.

Next steps

There is a growing consensus that mental and physical health services should be integrated more comprehensively. Many examples of integrated approaches are being implemented or attempted in Australia and overseas (185, 186, 193, 198, 239-241), but there is much more to be done. Barriers such as time, funding structures, training and provider knowledge and service design often mean that people with complex needs are not getting the support they need. Attitudes that separate mind and body in health care, evident in provider specialisation, health education and health services' structures, create further barriers to best practice patient care.

The data presented in this report build a case for action. More work is required to develop strategies to implement practice that will improve the physical health of people living with mental illness, the mental health of people living with chronic health conditions, and the health and wellbeing of more than 2.4 million Australians currently living with both chronic mental and physical health conditions.

Notes on the data

The presented in *Australia's Mental Health Tracker* are predominantly derived from the National Health Survey 2014–15, conducted by the Australian Bureau of Statistics (1). The exception is data on high cholesterol, which is from the Australian Health Survey 2011–12 (145). The two datasets differ, as outlined below.

The National Health Survey 2014–15 reported that 4.017 million Australians (17.5% of the population) have mental and behavioural conditions. These figures include people whose condition is current and long term and people who have not received an official diagnosis. Mental and behavioural conditions included anxiety, depression, alcohol and drug problems, and other mental health issues including psychosis and schizophrenia, summarised in the table below.

National Health Survey 2014–15

	Estimate '000	Proportion %
Alcohol and drug problems	230.9	1.0
Mood (affective) disorders		
Depression/feeling depressed	2 052.2	8.9
Other mood (affective) disorders	179.5	0.8
Total mood (affective) disorders	2 137.6	9.3
Anxiety related problems		
Anxiety disorders/feeling anxious, nervous or tense	2 207.0	9.6
Panic disorders/panic attackS	585.7	2.5
Phobic anxiety disorders	303.6	1.3
Obsessive-compulsive disorder	267.9	1.2
Post-traumatic stress disorder	232.3	1.0
Total anxiety related disorders	2 564.1	11.2
Problems of psychological development	293.8	1.3
Behavioural, cognitive & emotional problems with usual onset in childhood/adolescence	257.1	1.1
Other mental and behavioural problems	260.4	1.1
Symptoms and signs involving cognition, perceptions, emotional state and behaviour	40.3	0.2
Total mental and behavioural problems	4 017.4	17.5
Total population	**22 969.0**	**100.0**

For more information on the collection methods for the National Health Survey 2014–15, see the explanatory notes on the Australian Bureau of Statistics website.

The National Health Survey 2014–15 did not collect data on cholesterol; the data in this report were derived from the Australian Health Survey 2011–12. The collection methods for mental and behavioural issues differed between the two surveys, partly explaining why the ABS reported overall prevalence at 13.6% in the Australian Health Survey but 17.5% in the National Health Survey. The largest difference between the two surveys was in anxiety-related problems, which were reported by 3.8% of the respondents to the Australian Health Survey in 2011–12 and 11.2% of the respondents to the National Health Survey in 2014–15.

The baseline data for cholesterol levels amongst people with mental and behavioural conditions are different to the other data presented. Estimates of numbers of persons with high cholesterol are slightly higher than published figures, as the 2011–2012 National Health Survey rather than the Australian Health Survey core component had to be used in order to split data by mental/behavioural condition. Weights on this file are slightly different.

Survey TableBuilder was used by the Public Health Information Development Unit (PHIDU) at Torrens University Australia to access the data on risk factors. Comorbidity data were collected from Table 19 of the National Health Survey: First Results 2014–15, and prevalence rates for people living with mental health conditions were tabulated by the AHPC at Victoria University.

References

1. Australian Bureau of Statistics. National Health Survey: First Results, 2014-15 Canberra 2015.
2. McNamara K, Knight A, Livingston M, Kypri K, Malo J, Roberts L, et al. Targets and indicators for chronic disease prevention in Australia, . Melbourne AHPC 2015.
3. World Health Organization. Global Action Plan for the Prevention and Control of Non Communicable Diseases 2013-2020 Geneva: WHO; 2013.
4. World Health Organization. Global status report on noncommunicable diseases 2014. Geneva WHO 2014.
5. Harris B, Fetherton H, Calder R. Australia's Health Tracker by socioeconomic status. Melbourne AHPC 2017
6. Australian Institute of Health and Welfare. Australian Burden of Disease Study: impact and causes of illness and death in Australia 2011. Canberra: AIHW 2016.
7. United Nations. World Population Ageing 2017 New York; 2017.
8. Fortin M, Soubhi H, Hudon C, Bayliss EA, van den Akker M. Multimorbidity's many challenges. British Medical Journal. 2007;334(7602):1016.
9. Academy of Medical Sciences. Multimorbidity: a priority for global health research London 2018.
10. Valderas JM, Starfield B, Sibbald B, Salisbury C, Roland M. Defining comorbidity: implications for understanding health and health services. The Annals of Family Medicine. 2009;7(4):357-63.
11. Slade T, Johnston A, Oakley Browne MA, Andrews G, Whiteford H. 2007 National Survey of Mental Health and Wellbeing: methods and key findings. Australian and New Zealand Journal of Psychiatry. 2009;43(7):594-605.
12. Organisation for Economic Co-operation and Development. Making mental health count: the social and economic costs of neglecting mental health care. Geneva OECD 2014
13. Australian Institute of Health and Welfare. Mental Health Services- in brief 2014 Canberra AIHW 2014
14. Department of Social Services. DSS payment demographic data: DSS demographics December 2017 Canberra 2018 [Available from: https://data.gov.au/dataset/dss-payment-demographic-data
15. National Mental Health Commission. Equally Well Consensus Statement: Improving the Physical Health and Wellbeing of People Living with Mental Illness in Australia. Sydney 2016.
16. National Mental Health Commission. The 2017 National Report on Mental Health and Suicide Prevention Sydney National Mental Health Commission; 2017
17. Mental Health Commission of New South Wales. Physical Health and Mental Wellbeing: evidence guide. Sydney: Mental Health Commission of New South Wales; 2016.
18. Western Australian Mental Health Commission. Better Choices. Better Lives: Western Australian Mental Health, Alcohol and Other Drug Services Plan 2015–2025. Perth: Western Australian Mental Health Commission; 2015.
19. Victorian Government. Victoria's 10-year Mental Health Plan. Melbourne 2015.
20. Queensland Health. Connecting Care to Recovery 2016-2021: a plan for Queensland's state-funded mental health, alcohol and other drug services. State of Queensland2015.

21. South Australian Mental Health Commission. South Australian Mental Health Strategic Plan 2017-2022. Adelaide2017.
22. Department of Health and Human Services (Tasmania). Rethink Mental Health: Better Mental Health and Wellbeing: a long-term plan for mental health in Tasmania 2015-2025. Hobart 2015.
23. Royal Australian & New Zealand College of Psychiatrists. Keeping Body and Mind Together: improving the physical health and life expectancy of people with serious mental illness. 2015.
24. World Health Organization. Mental health action plan 2013-2020 Geneva WHO 2013
25. Lawrence D, Hancock KJ, Kisely S. The gap in life expectancy from preventable physical illness in psychiatric patients in Western Australia: retrospective analysis of population based registers. British Medical Journal. 2013;346:f2539.
26. Chang C-K, Hayes RD, Perera G, Broadbent MT, Fernandes AC, Lee WE, et al. Life expectancy at birth for people with serious mental illness and other major disorders from a secondary mental health care case register in London. PloS one. 2011;6(5):e19590.
27. Lawrence D, Hancock KJ, Kisely S. Cancer and Mental Illness. Comorbidity of Mental and Physical Disorders. Key Issues in Mental Health 2014. p. 88-98.
28. Australian Bureau of Statistics. Causes of Death, Australia 2016. Canberra 2017.
29. Australian Institute of Health and Welfare. Cancer in Australia 2017. Canberra AIHW; 2017.
30. Australian Institute of Health and Welfare. Cardiovascular Health Compendium. Canberra: Australian Institute of Health and Welfare,; 2017.
31. Reynolds SL, Haley WE, Kozlenko N. The Impact of Depressive Symptoms and Chronic Diseases on Active Life Expectancy in Older Americans. The American Journal of Geriatric Psychiatry. 2008;16(5):425-32.
32. Steensma C, Loukine L, Orpana H, McRae L, Vachon J, Mo F, et al. Describing the population health burden of depression: health-adjusted life expectancy by depression status in Canada. Health Promotion and Chronic Disease Prevention in Canada. 2016;36(10):205-13.
33. Walker ER, McGee RE, Druss BG. Mortality in mental disorders and global disease burden implications: a systematic review and meta-analysis. JAMA psychiatry. 2015;72(4):334-41.
34. Yang L, Korhonen K, Moustgaard H, Silventoinen K, Martikainen P. Pre-existing depression predicts survival in cardiovascular disease and cancer. Journal of epidemiology and community health. 2018(0):1-6
35. Razmara A, Valle N, Markovic D, Sanossian N, Ovbiagele B, Dutta T, et al. Depression Is Associated with a Higher Risk of Death among Stroke Survivors. Journal of Stroke and Cerebrovascular Disease. 2017;26(12):2870-9.
36. Jani BD, Boachie C, McCowan C, Barry SJE, Cavanagh J, Mair FS. Relationship of depression screening in cardiometabolic disease with vascular events and mortality: findings from a large primary care cohort with 4 years follow-up. European Heart Journal - Quality of Care and Clinical Outcomes. 2017;3(1):61-73.
37. Takagi H, Ando T, Umemoto T. Perioperative depression or anxiety and postoperative mortality in cardiac surgery: a systematic review and meta-analysis. Heart and vessels. 2017;32(12):1458-68.
38. Correll CU, Solmi M, Veronese N, Bortolato B, Rosson S, Santonastaso P, et al. Prevalence, incidence and mortality from cardiovascular disease in patients with pooled and specific severe mental illness: a large-scale meta-analysis of 3,211,768 patients and 113,383,368 controls. World Psychiatry. 2017;16(2):163-80.

39. Vancampfort D, Stubbs B, Mitchell AJ, De Hert M, Wampers M, Ward PB, et al. Risk of metabolic syndrome and its components in people with schizophrenia and related psychotic disorders, bipolar disorder and major depressive disorder: a systematic review and meta-analysis. World Psychiatry. 2015;14(3):339-47.

40. Gunn JM, Ayton DR, Densley K, Pallant JF, Chondros P, Herrman HE, et al. The association between chronic illness, multimorbidity and depressive symptoms in an Australian primary care cohort. Social psychiatry and psychiatric epidemiology. 2012;47(2):175-84.

41. Moussavi S, Chatterji S, Verdes E, Tandon A, Patel V, Ustun B. Depression, chronic diseases, and decrements in health: results from the World Health Surveys. The Lancet. 2007;370(9590):851-8.

42. Australian institute of Health and Welfare. Bulletin 141 Trends in cardiovascular deaths. Canberra 2017.

43. Australian Institute of Health and Welfare. Health care expenditure on cardiovascular diseases 2008-09. Canberra: AIHW; 2014.

44. Australia Institute of Health and Welfare. Contribution of vascular diseases and risk factors to the burden of dementia in Australia: Australian Burden of Disease Study, 2011. In: AIHW, editor. Australian Burden of Disease Study series ed. Canberra2016.

45. National Health Performance Authority. Healthy communities: potentially preventable hospitalisations in 2013-14. Canberra NHPA 2015.

46. Australian Institute of Health and Welfare. Australia's health 2016. Canberra: AIHW; 2016.

47. Tideman P, Taylor AW, Janus E, Philpot B, Clark R, Peach E, et al. A comparison of Australian rural and metropolitan cardiovascular risk and mortality: the Greater Green Triangle and North West Adelaide population surveys. BMJ open. 2013;3(8).

48. McMunn A, Nazroo J, Breeze E. Inequalities in health at older ages: a longitudinal investigation of the onset of illness and survival effects in England. Age and Ageing. 2009;38(2):181-7.

49. Arkles R, Jackson Pulver L, Robertson H, Draper B, Chalkley S, Broe G. Ageing, cognition and dementia in Australian Aboriginal and Torres Strait Islander peoples. Sydney: Neuroscience Research Australia and Muru Marri Indigenous Health Unit, UNSW2010.

50. National Vascular Disease Prevention Alliance. Guidelines for the management of absolute cardiovascular disease risk. Canberra National Stroke Foundation; 2010.

51. Carter P, Reynolds J, Carter A, Potluri S, Uppal H, Chandran S, et al. The impact of psychiatric comorbidities on the length of hospital stay in patients with heart failure. International journal of cardiology. 2016;207:292-6.

52. O'Neil A, Williams ED, Stevenson CE, Oldenburg B, Sanderson K. Co-morbid depression is associated with poor work outcomes in persons with cardiovascular disease (CVD): a large, nationally representative survey in the Australian population. BMC public health. 2012;12:47.

53. Morgan VA, Waterreus A, Jablensky A, Mackinnon A, McGrath JJ, Carr V, et al. People living with psychotic illness in 2010: the second Australian national survey of psychosis. Australian and New Zealamd Journal of Psychiatry. 2012;46(8):735-52.

54. Satizabal CL, Beiser AS, Chouraki V, Chêne G, Dufouil C, Seshadri S. Incidence of Dementia over Three Decades in the Framingham Heart Study. New England Journal of Medicine. 2016;374(6):523-32.

55. Capewell S, Buchan I. Why have sustained increases in obesity and type 2 diabetes not offset declines

in cardiovascular mortality over recent decades in Western countries? Nutrition, Metabolism and Cardiovascular Diseases. 2012;22(4):307-11.

56. Dunbar J, Duggan M, Fetherston H, Knight A, Mc Namara K, Banks E, et al. Heart Health: the first step to getting Australia's health on track. Melbourne: Australian Health Policy Collaboration, Victoria University; 2017.

57. Chima CC, Salemi JL, Wang M, Mejia de Grubb MC, Gonzalez SJ, Zoorob RJ. Multimorbidity is associated with increased rates of depression in patients hospitalized with diabetes mellitus in the United States. Journal of diabetes and its complications. 2017;31(11):1571-9.

58. Davydow DS, Russo JE, Ludman E, Ciechanowski P, Lin EH, Von Korff M, et al. The association of comorbid depression with intensive care unit admission in patients with diabetes: a prospective cohort study. Psychosomatics. 2011;52(2):117-26.

59. Australian Bureau of Statistics. Australian Aboriginal and Torres Strait Islander Health Survey: First Results, Australia, 2012-13 Canberra 2013

60. Katon WJ, Lin EH, Von Korff M, Ciechanowski P, Ludman EJ, Young B, et al. Collaborative care for patients with depression and chronic illnesses. New England Journal of Medicine. 2010;363(27):2611-20.

61. Hutter N, Schnurr A, Baumeister H. Healthcare costs in patients with diabetes mellitus and comorbid mental disorders—a systematic review. Diabetologia. 2010;53(12):2470-9.

62. Boulanger L, Zhao Y, Foster TS, Fraser K, Bledsoe SL, Russell MW. Impact of comorbid depression or anxiety on patterns of treatment and economic outcomes among patients with diabetic peripheral neuropathic pain. Current Medical Research and Opinion. 2009;25(7):1763-73.

63. Boden MT. Prevalence of mental disorders and related functioning and treatment engagement among people with diabetes. Journal of Psychosomatic Research. 2018;106:62-9.

64. Holt RI, Mitchell AJ. Diabetes mellitus and severe mental illness: mechanisms and clinical implications. Nature Reviews Endocrinology. 2015;11(2):79-89.

65. Álvarez-Jiménez M, Martínez-García O, Pérez-Iglesias R, Ramírez ML, Vázquez-Barquero JL, Crespo-Facorro B. Prevention of antipsychotic-induced weight gain with early behavioural intervention in first-episode psychosis: 2-year results of a randomized controlled trial. Schizophrenia Research. 2010;116(1):16-9.

66. Leucht S, Cipriani A, Spineli L, Mavridis D, Örey D, Richter F, et al. Comparative efficacy and tolerability of 15 antipsychotic drugs in schizophrenia: a multiple-treatments meta-analysis. The Lancet. 2013;382(9896):951-62.

67. Teff KL, Rickels MR, Grudziak J, Fuller C, Nguyen H-L, Rickels K. Antipsychotic-induced insulin resistance and postprandial hormonal dysregulation independent of weight gain or psychiatric disease. Diabetes. 2013;62(9):3232-40.

68. Australian Institute of Health and Welfare. Impacts of chronic back problems. Canberra AIHW 2016.

69. Australian Institute of Health and Welfare. Data Tables: back problems Canberra AIHW 2017 [Available from: https://www.aihw.gov.au/reports/arthritis-other-musculoskeletal-conditions/back-problems/data

70. Australian Institute of Health and Welfare. Data Tables: back problems, associated comorbidities and risk factors Canberra AIHW 2016 [Available from: https://www.aihw.gov.au/reports/arthritis-other-musculoskeletal-conditions/back-problems/data

71. Fishbain DA, Cutler R, Rosomoff HL, Rosomoff RS. Chronic pain-associated depression: antecedent or consequence of chronic pain? A review. The Clinical journal of pain. 1997;13(2):116-37.

72. Vowles KE, McEntee ML, Julnes PS, Frohe T, Ney JP, van der Goes DN. Rates of opioid misuse, abuse, and addiction in chronic pain: a systematic review and data synthesis. Pain. 2015;156(4):569-76.

73. Campbell G, Darke S, Bruno R, Degenhardt L. The prevalence and correlates of chronic pain and suicidality in a nationally representative sample. Australian & New Zealand Journal of Psychiatry. 2015;49(9):803-11.

74. Baumeister H, Knecht A, Hutter N. Direct and indirect costs in persons with chronic back pain and comorbid mental disorders--a systematic review. Journal of Psychosomatic Research. 2012;73(2):79-85.

75. Australian Institute of Health and Welfare. The burden of musculoskeletal conditions in Australia: a detailed analysis of the Australian Burden of Disease Study 2011. Canberra AIHW 2017.

76. Australian Institute of Health and Welfare. Admitted patient care 2015-16: Australian hospital statistics. Canberra AIHW 2014.

77. Dominick CH, Blyth FM, Nicholas MK. Unpacking the burden: understanding the relationships between chronic pain and comorbidity in the general population. Pain. 2012;153(2):293-304.

78. Schofield DJ, Callander EJ, Shrestha RN, Passey ME, Percival R, Kelly SJ. How co-morbidities magnify the effect of arthritis on labour force participation and economic status: a costs of illness study in Australia. Rheumatology International. 2014;34(4):481-9.

79. Australian Institute of Health and Welfare. Asthma: web report. Canberra AIHW; 2017.

80. Australian Institute of Health and Welfare. The Burden of Chronic Respiratory Conditions in Australia: a detailed analysis of the Australian Burden of Disease Study 2011 Canberra AIHW; 2017.

81. Walters P, Schofield P, Howard L, Ashworth M, Tylee A. The relationship between asthma and depression in primary care patients: a historical cohort and nested case control study. PloS one. 2011;6(6):e20750.

82. Hutter N, Knecht A, Baumeister H. Health care costs in persons with asthma and comorbid mental disorders: a systematic review. General hospital psychiatry. 2011;33(5):443-53.

83. Hakola R, Kauppi P, Leino T, Ojajärvi A, Pentti J, Oksanen T, et al. Persistent asthma, comorbid conditions and the risk of work disability: a prospective cohort study. Allergy. 2011;66(12):1598-603.

84. Del Giacco SR, Cappai A, Gambula L, Cabras S, Perra S, Manconi PE, et al. The asthma-anxiety connection. Respiratory medicine. 2016;120:44-53.

85. Dudeney J, Sharpe L, Jaffe A, Jones EB, Hunt C. Anxiety in youth with asthma: A meta-analysis. Pediatric Pulmonology. 2017;52(9):1121-9.

86. Australian Institute of Health and Welfare. COPD (chronic obstructive pulmonary disease): web report. Canberra AIHW 2017.

87. Wacker ME, Kitzing K, Jorres RA, Leidl R, Schulz H, Karrasch S, et al. The contribution of symptoms and comorbidities to the economic impact of COPD: an analysis of the German COSYCONET cohort. International journal of chronic obstructive pulmonary disease. 2017;12:3437-48.

88. Brandl M, Bohmer MM, Brandstetter S, Finger T, Fischer W, Pfeifer M, et al. Factors associated with generic health-related quality of life (HRQOL) in patients with chronic obstructive pulmonary disease (COPD): a cross-sectional study. Journal of thoracic disease. 2018;10(2):766-75.

89. Mausbach BT, Yeung P, Bos T, Irwin SA. Health care costs of depression in patients diagnosed with cancer. Psycho-oncology. 2018.

90. International Agency for Research on Cancer. World Cancer Report 2014. Geneva World Health Organization 2014.

91. Australian Health Ministers' Advisory Council. National Strategic Framework for Chronic Conditions Canberra: Australian Government; 2017.

92. Fortin M, Bravo G, Hudon C, Vanasse A, Lapointe L. Prevalence of multimorbidity among adults seen in family practice. The Annals of Family Medicine. 2005;3(3):223-8.

93. Fortin M, Bravo G, Hudon C, Lapointe L, Dubois M-F, Almirall J. Psychological distress and multimorbidity in primary care. The Annals of Family Medicine. 2006;4(5):417-22.

94. Condelius A, Edberg A-K, Jakobsson U, Hallberg IR. Hospital admissions among people 65+ related to multimorbidity, municipal and outpatient care. Archives of Gerontology and Geriatrics. 2008;46(1):41-55.

95. Bayliss EA, Bayliss MS, Ware JE, Steiner JF. Predicting declines in physical function in persons with multiple chronic medical conditions: what we can learn from the medical problem list. Health and quality of life outcomes. 2004;2(1):47.

96. Wolff J, Heister T, Normann C, Kaier K. Hospital costs associated with psychiatric comorbidities: a retrospective study. BMC health services research. 2018;18(1):67.

97. Hensel JM, Taylor VH, Fung K, de Oliveira C, Vigod SN. Unique Characteristics of High-Cost Users of Medical Care With Comorbid Mental Illness or Addiction in a Population-Based Cohort. Psychosomatics. 2018;59(2):135-43.

98. Wang L, Si L, Cocker F, Palmer AJ, Sanderson K. A Systematic Review of Cost-of-Illness Studies of Multimorbidity. Applied Health Economics Health Policy. 2018;16(1):15-29.

99. McPhail SM. Multimorbidity in chronic disease: impact on health care resources and costs. Risk Management and Healthcare Policy. 2016;9:143-56.

100. Gadermann AM, Alonso J, Vilagut G, Zaslavsky AM, Kessler RC. Comorbidity and disease burden in the National Comorbidity Survey Replication (NCS-R). Depression and anxiety. 2012;29(9):797-806.

101. Druss BG, Hwang I, Petukhova M, Sampson NA, Wang PS, Kessler RC. Impairment in role functioning in mental and chronic medical disorders in the United States: results from the National Comorbidity Survey Replication. Molecular psychiatry. 2009;14(7):728-37.

102. Unützer J, Schoenbaum M, Katon WJ, Fan MY, Pincus HA, Hogan D, et al. Healthcare Costs Associated with Depression in Medically Ill Fee-for-Service Medicare Participants. Journal of the American Geriatrics Society. 2009;57(3):506-10.

103. Welch CA, Czerwinski D, Ghimire B, Bertsimas D. Depression and costs of health care. Psychosomatics. 2009;50(4):392-401.

104. Talge NM, Neal C, Glover V, Early Stress TR, Fetal PSN, Child NEo, et al. Antenatal maternal stress and long-term effects on child neurodevelopment: how and why? Journal of Child Psychology and Psychiatry. 2007;48(3-4):245-61.

105. Royal Australian & New Zealand College of Psychiatrists and Australian Health Policy Collaboration. The economic cost of serious mental illness and comorbidities in Australia and New Zealand: a report for the

Royal Australian & New Zealand College of Psychiatrists and the Australian Health Policy Collaboration by Victoria Institute of Strategic Economic Studies Melbourne RANZCP 2016.

106. Australian Institute of Health and Welfare. Co-morbidity of mental disorders and physical conditions 2007. Canberra AIHW 2012

107. Yohannes A, Willgoss T, Baldwin R, Connolly M. Depression and anxiety in chronic heart failure and chronic obstructive pulmonary disease: prevalence, relevance, clinical implications and management principles. International Journal of Geriatric Psychiatry. 2010;25(12):1209-21.

108. investigators EM, Alonso J, Angermeyer M, Bernert S, Bruffaerts R, Brugha T, et al. Disability and quality of life impact of mental disorders in Europe: results from the European Study of the Epidemiology of Mental Disorders (ESEMeD) project. Acta Psychiatrica Scandinavica. 2004;109:38-46.

109. Fortin M, Lapointe L, Hudon C, Vanasse A, Ntetu AL, Maltais D. Multimorbidity and quality of life in primary care: a systematic review. Health and quality of life outcomes. 2004;2(1):51.

110. DiMatteo MR, Lepper HS, Croghan TW. Depression is a risk factor for noncompliance with medical treatment: meta-analysis of the effects of anxiety and depression on patient adherence. Archives of Internal Medicine. 2000;160(14):2101-7.

111. Naylor C, Parsonage M, McDaid D, Knapp M, Fossey M, Galea A. Long-term conditions and mental health: the cost of co-morbidities. London The King's Fund 2012.

112. Guthrie B, McCowan C, Davey P, Simpson CR, Dreischulte T, Barnett K. High risk prescribing in primary care patients particularly vulnerable to adverse drug events: cross sectional population database analysis in Scottish general practice. British Medical Journal. 2011;342:d3514.

113. O'Brien R, Wyke S, Guthrie B, Watt G, Mercer S. An 'endless struggle': a qualitative study of general practitioners' and practice nurses' experiences of managing multimorbidity in socio-economically deprived areas of Scotland. Chronic Illness. 2011;7(1):45-59.

114. de Hert M, Correll CU, Bobes J, Cetkovich-Bakmas M, Cohen D, Asai I, et al. Physical illness in patients with severe mental disorders. I. Prevalence, impact of medications and disparities in health care. World Psychiatry. 2011;10(1):52-77.

115. Benton T, Staab J, Evans DL. Medical Co-Morbidity in Depressive Disorders. Annals of Clinical Psychiatry. 2007;19(4):289-303.

116. Baum A, Contrada R. The handbook of stress science: Biology, psychology, and health: Springer Publishing Company; 2010.

117. Juster R-P, McEwen BS, Lupien SJ. Allostatic load biomarkers of chronic stress and impact on health and cognition. Neuroscience & Biobehavioral Reviews. 2010;35(1):2-16.

118. Eaton WW, Shao H, Nestadt G, Lee BH, Bienvenu OJ, Zandi P. Population-based study of first onset and chronicity in major depressive disorder. Archives of General Psychiatry. 2008;65(5):513-20.

119. Prince M, Patel V, Saxena S, Maj M, Maselko J, Phillips MR, et al. No health without mental health. The Lancet. 2007;370(9590):859-77.

120. U.S. Department of Health and Human Services. The Health Consequences of Smoking - 50 years of progress: a report of the Surgeon General. Altanta GA Centers for Disease Control and Prevention; 2014.

121. Willcox S. Chronic diseases in Australia: blueprint for preventive action. Melbourne Australian Health

Policy Collaboration 2015.

122. Morgan VA, McGrath JJ, Jablensky A, Badcock JC, Waterreus A, Bush R, et al. Psychosis prevalence and physical, metabolic and cognitive co-morbidity: data from the second Australian national survey of psychosis. Psychological Medicine. 2014;44(10):2163-76.
123. Australian Bureau of Statistics. National Aboriginal and Torres Strait Islander Social Survey 2014-15 Canberra ABS 2016.
124. Weinberger AH, Kashan RS, Shpigel DM, Esan H, Taha F, Lee CJ, et al. Depression and cigarette smoking behavior: A critical review of population-based studies. The American Journal of Drug and Alcohol Abuse. 2017;43(4):416-31.
125. de Leon J, Diaz FJ. A meta-analysis of worldwide studies demonstrates an association between schizophrenia and tobacco smoking behaviors. Schizophrenia Research. 2005;76(2-3):135-57.
126. Kelly PJ, Baker AL, Deane FP, KAY-LAMBKIN FJ, Bonevski B, Tregarthen J. Prevalence of smoking and other health risk factors in people attending residential substance abuse treatment. Drug and Alcohol Review. 2012;31(5):638-44.
127. Lineberry TW, Allen JD, Nash J, Galardy CW. Population-based prevalence of smoking in psychiatric inpatients: a focus on acute suicide risk and major diagnostic groups. Comprehensive Psychiatry. 2009;50(6):526-32.
128. Jackson CA, Dobson AJ, Tooth LR, Mishra GD. Lifestyle and socioeconomic determinants of multimorbidity patterns among mid-aged women: a longitudinal study. PloS one. 2016;11(6):e0156804.
129. Australian Institute of Health and Welfare. Diabetes and poor mental health and wellbeing: an exploratory analysis. Canberra AIHW 2011.
130. Steinberg ML, Williams JM, Li Y. Poor mental health and reduced decline in smoking prevalence. American journal of preventive medicine. 2015;49(3):362-9.
131. Taylor G, McNeill A, Girling A, Farley A, Lindson-Hawley N, Aveyard P. Change in mental health after smoking cessation: systematic review and meta-analysis. British Medical Journal. 2014;348:g1151.
132. Tolhurst P, Lindberg R, Calder R, Dunbar J, de Courten M. Australia's Health Tracker. Melbourne Australian Health Policy Collaboration 2016.
133. Australian Institute of Health and Welfare. Impact of alcohol and illicit drug use on the burden of disease and injury in Australia. Canberra AIHW 2018.
134. Teesson M, Slade T, Mills K. Comorbidity in Australia: Findings of the 2007 National Survey of Mental Health and Wellbeing. Australian & New Zealand Journal of Psychiatry. 2009;43(7):606-14.
135. Vancampfort D, Rosenbaum S, Schuch F, Ward PB, Richards J, Mugisha J, et al. Cardiorespiratory Fitness in Severe Mental Illness: A Systematic Review and Meta-analysis. Sports Medicine. 2017;47(2):343-52.
136. Schuch F, Vancampfort D, Firth J, Rosenbaum S, Ward P, Reichert T, et al. Physical activity and sedentary behavior in people with major depressive disorder: a systematic review and meta-analysis. Journal of Affective Disorders. 2017;210:139-50.
137. Soundy A, Wampers M, Probst M, De Hert M, Stubbs B, Vancampfort D, et al. Physical activity and sedentary behaviour in outpatients with schizophrenia: a systematic review and meta-analysis. International Journal of Therapy and Rehabilitation. 2013;20(12):588-95.

138. Schuch FB, Vancampfort D, Firth J, Rosenbaum S, Ward PB, Silva ES, et al. Physical activity and incident depression: a meta-analysis of prospective cohort studies. American Journal of Psychiatry. 2018:appi. ajp. 2018.17111194.

139. Rebar AL, Stanton R, Geard D, Short C, Duncan MJ, Vandelanotte C. A meta-meta-analysis of the effect of physical activity on depression and anxiety in non-clinical adult populations. Health Psychology Review. 2015;9(3):366-78.

140. Rosenbaum S, Tiedemann A, Stanton R, Parker A, Waterreus A, Curtis J, et al. Implementing evidence-based physical activity interventions for people with mental illness: an Australian perspective. Australasian Psychiatry. 2016;24(1):49-54.

141. Cooney G, Dwan K, Mead G. Exercise for depression. Jama. 2014;311(23):2432-3.

142. Firth J, Cotter J, Elliott R, French P, Yung A. A systematic review and meta-analysis of exercise interventions in schizophrenia patients. Psychological medicine. 2015;45(7):1343-61.

143. World Health Organization. Obesity and Overweight Geneva 2018 [updated February 2018 Available from: http://www.who.int/mediacentre/factsheets/fs311/en/

144. Luppino FS, de Wit LM, Bouvy PF, Stijnen T, Cuijpers P, Penninx BW, et al. Overweight, obesity, and depression: a systematic review and meta-analysis of longitudinal studies. Archives of General Psychiatry. 2010;67(3):220-9.

145. Australian Bureau of Statistics. Australian Health Survey. Canberra 2016.

146. Franklin SS, Larson MG, Khan SA, Wong ND, Leip EP, Kannel WB, et al. Does the Relation of Blood Pressure to Coronary Heart Disease Risk Change With Aging? The Framingham Heart Study. 2001;103(9):1245-9.

147. Commonwealth of Australia. 2015 Intergenerational Report: Australia in 2055. Canberra CanPrint 2015.

148. Tinetti ME, Fried TR, Boyd CM. Designing health care for the most common chronic condition--multimorbidity. Jama. 2012;307(23):2493-4.

149. Aspin C, Jowsey T, Glasgow N, Dugdale P, Nolte E, O'Hallahan J, et al. Health policy responses to rising rates of multi-morbid chronic illness in Australia and New Zealand. Australian and New Zealand Journal of Public Health. 2010;34(4):386-93.

150. Britt HC, Harrison CM, Miller GC, Knox SA. Prevalence and patterns of multimorbidity in Australia. Medical Journal of Australia. 2008;189(2):72-7.

151. Institute of Public Policy Research. The Lord Darzi review of health and care: interim report. London Institute of Public Policy Research 2018

152. Productivity Commission. Shifting the dial: 5 year productivity review Canberra: PC 2017.

153. Primary Health Care Advisory Group. Better outcomes for people with chronic and complex health conditions. Canberra: Department of Health; 2015

154. Duggan M. Beyond the fragments: Preventing the costs and consequences of chronic physical and mental diseases Melbourne: AHPC 2015.

155. Organisation for Economic Co-operation and Development. OECD health data: health expenditure and financing: health expenditure indicators. Geneva OECD 2014

156. Australian Institute of Health and Welfare. Health expenditure Australia 2015-16. Canberra AIHW; 2017.

157. Paolucci F, García-Goñi M. The case for change towards universal and sustainable national health insurance & financing for Australia: enabling the transition to a chronic condition focussed health care system. Melbourne 2015.

158. Barnett K, Mercer SW, Norbury M, Watt G, Wyke S, Guthrie B. Epidemiology of multimorbidity and implications for health care, research, and medical education: a cross-sectional study. The Lancet. 2012;380(9836):37-43.

159. Calder R, Glover J, McNeil J, Harris B, Lindberg R. Better data for better decisions: the case for an Australian Health Survey. Melbourne 2018.

160. Australian Institute of Health and Welfare. Mental health services in brief 2017. Canberra AIHW 2017.

161. Australian Institute of Health and Welfare. Mental health services in Australia Canberra AIHW 2018

162. Pirkis J, Burgess P, Hardy J, Harris M, Slade T, Johnston A. Who cares? A profile of people who care for relatives with a mental disorder. Australian and New Zealand Journal of Psychiatry. 2010;44(10):929-37.

163. Jackson H, Shiell A. Preventive health: how much does Australia spend and is it enough? Canberra Foundation for Alcohol Research and Education 2017

164. Suetani S, Rosenbaum S, Scott J, Curtis J, Ward P. Bridging the gap: What have we done and what more can we do to reduce the burden of avoidable death in people with psychotic illness? Epidemiology and Psychiatric Sciences. 2016;25(3):205-10.

165. Bartels SJ. Can behavioral health organizations change health behaviors? The STRIDE study and lifestyle interventions for obesity in serious mental illness. 2014;172(1):9-11.

166. Royal Australian & New Zealand College of Psychiatrists. Advocating for mental health resources commensurate with the burden of disease; 2018-19 pre-budget submission Melbourne RANZCP 2017.

167. Batterham PJ, McGrath J, McGorry PD, Kay-Lambkin FJ, Hickie IB, Christensen H. NHMRC funding of mental health research. The Medical journal of Australia. 2016;205(8):350-1.

168. Seldenrijk A, Vogelzangs N, Batelaan NM, Wieman I, van Schaik DJ, Penninx BJ. Depression, anxiety and 6-year risk of cardiovascular disease. Journal of Psychosomatic Research. 2015;78(2):123-9.

169. Galletly C, Castle D, Dark F, Humberstone V, Jablensky A, Killackey E, et al. Royal Australian and New Zealand College of Psychiatrists clinical practice guidelines for the management of schizophrenia and related disorders. Australian & New Zealand Journal of Psychiatry. 2016;50(5):410-72.

170. Duerden M, Avery T, Payne R. Polypharmacy and medicines optimisation. Making it safe and sound (King's Fund, London). 2013.

171. Townsend A, Hunt K, Wyke S. Managing multiple morbidity in mid-life: a qualitative study of attitudes to drug use. British Medical Journal. 2003;327(7419):837.

172. Ambresin G, Palmer V, Densley K, Dowrick C, Gilchrist G, Gunn JM. What factors influence long-term antidepressant use in primary care? Findings from the Australian diamond cohort study. Journal of Affective Disorders. 2015;176:125-32.

173. Shiers D, Rali I, Cooper S, Holt R. Positive cardiometabolic health resource: an intervention framework for patients with psychosis and schizophrenia: 2014 update. London Royal College of Psychiatrists 2014.

174. Curtis J, Newall H, Samaras K. Positive cardiometabolic health: an early intervention framework for patients on psychotropic medication. Sydney: HETI Health Education and Training 2011.

175. Rosenbaum S, Tiedemann A, Ward PB. Meta-analysis physical activity interventions for people with mental illness: a systematic review and meta-analysis. Journal of Clinical Psychiatry. 2014;75(0):1-11.

176. Rosenbaum S, Hobson-Powell A, Davison K, Stanton R, Craft LL, Duncan M, et al. The Role of Sport, Exercise, and Physical Activity in Closing the Life Expectancy Gap for People with Mental Illness: An International Consensus Statement by Exercise and Sports Science Australia, American College of Sports Medicine, British Association of Sport and Exercise Science, and Sport and Exercise Science New Zealand. Translational Journal of the American College of Sports Medicine. 2018;3(10):72-3.

177. Teasdale SB, Latimer G, Byron A, Schuldt V, Pizzinga J, Plain J, et al. Expanding collaborative care: integrating the role of dietitians and nutrition interventions in services for people with mental illness. Australasian Psychiatry. 2017;26(1):47-9.

178. Bartlem KM, Bowman JA, Bailey JM, Freund M, Wye PM, Lecathelinais C, et al. Chronic disease health risk behaviours amongst people with a mental illness. Australian & New Zealand Journal of Psychiatry. 2015;49(8):731-41.

179. Bartlem K, Bailey J, Metse A, Asara A, Wye P, Clancy R, et al. Do mental health consumers want to improve their long-term disease risk behaviours? A survey of over 2000 psychiatric inpatients. International Journal of Mental Health Nursing. 2017;27(3):1032-43.

180. Firth J, Rosenbaum S, Stubbs B, Gorczynski P, Yung AR, Vancampfort D. Motivating factors and barriers towards exercise in severe mental illness: a systematic review and meta-analysis. Psychological Medicine. 2016;46(14):2869-81.

181. Happell B, Scott D, Platania-Phung C, Nankivell J. Should we or shouldn't we? Mental health nurses' views on physical health care of mental health consumers. International Journal of Mental Health Nursing. 2012;21(3):202-10.

182. Stockings E, Bowman J, McElwaine K, Baker A, Terry M, Clancy R, et al. Readiness to quit smoking and quit attempts among Australian mental health inpatients. Nicotine & Tobacco Research. 2012;15(5):942-9.

183. Price JH, Ambrosetti LM, Sidani JE, Price JA. Psychiatrists' smoking cessation activities with Ohio community mental health center patients. Community Mental Health Journal. 2007;43(3):251-66.

184. Bartlem K, Bowman J, Freund M, Wye P, Lecathelinais C, McElwaine K, et al. Acceptability and receipt of preventive care for chronic-disease health risk behaviors reported by clients of community mental health services. Psychiatric Services. 2015;66(8):857-64.

185. Morgan M, Dunbar J, Reddy P, Coates M, Leahy R. The TrueBlue study: Is practice nurse-led collaborative care effective in the management of depression for patients with heart disease or diabetes? BMC Family Practice. 2009;10(1):46.

186. McElwaine KM, Freund M, Campbell EM, Slattery C, Wye PM, Lecathelinais C, et al. Clinician assessment, advice and referral for multiple health risk behaviors: prevalence and predictors of delivery by primary health care nurses and allied health professionals. Patient Education and Counseling. 2014;94(2):193-201.

187. Teasdale SB, Ward PB, Rosenbaum S, Samaras K, Stubbs B. Solving a weighty problem: Systematic review and meta-analysis of nutrition interventions in severe mental illness. British Journal of Psychiatry. 2017;210(2):110-8.

188. Harris M, Lloyd J. The role of Australian primary health care in the prevention of chronic disease. Australian National Preventive Health Agency: Canberra; 2012.

189. Glasgow RE, Goldstein MG, Ockene JK, Pronk NP. Translating what we have learned into practice: principles and hypotheses for interventions addressing multiple behaviors in primary care. American journal of preventive medicine. 2004;27(2):88-101.

190. Coups EJ, Gaba A, Orleans CT. Physician screening for multiple behavioral health risk factors. American journal of preventive medicine. 2004;27(2):34-41.

191. Whitlock EP, Orleans CT, Pender N, Allan J. Evaluating primary care behavioral counseling interventions: An evidence-based approach 1. American journal of preventive medicine. 2002;22(4):267-84.

192. Schroeder SA. What to do with a patient who smokes. Jama. 2005;294(4):482-7.

193. Wye PM, Stockings EA, Bowman JA, Oldmeadow C, Wiggers JH. Effectiveness of a clinical practice change intervention in increasing the provision of nicotine dependence treatment in inpatient psychiatric facilities: an implementation trial. BMC Psychiatry. 2017;17(1):56.

194. Schroeder SA, Morris CD. Confronting a neglected epidemic: tobacco cessation for persons with mental illnesses and substance abuse problems. Annual Review of Public Health. 2010;31:297-314.

195. Vidrine JI, Shete S, Cao Y, Greisinger A, Harmonson P, Sharp B, et al. Ask-Advise-Connect: a new approach to smoking treatment delivery in health care settings. JAMA Internal Medicine. 2013;173(6):458-64.

196. Bartlem KM, Bowman JA, Freund M, Wye PM, McElwaine KM, Wolfenden L, et al. Care provision to prevent chronic disease by community mental health clinicians. American journal of preventive medicine. 2014;47(6):762-70.

197. Dixon LB, Medoff D, Goldberg R, Lucksted A, Kreyenbuhl J, DiClemente C, et al. Is implementation of the 5 A's of smoking cessation at community mental health centers effective for reduction of smoking by patients with serious mental illness? American Journal on Addictions. 2009;18(5):386-92.

198. Fehily C, Bartlem K, Wiggers J, Wye P, Clancy R, Castle D, et al. Evaluating the effectiveness of a healthy lifestyle clinician in addressing the chronic disease risk behaviours of community mental health clients: study protocol for a randomised controlled trial. Trials. 2017;18(1):276.

199. Happell B, Ewart SB, Platania-Phung C, Bocking J, Griffiths K, Scholz B, et al. Embedding a physical health nurse consultant within mental health services: Consumers' perspectives. International Journal of Mental Health Nursing. 2016;25(4):377-84.

200. McKenna B, Furness T, Wallace E, Happell B, Stanton R, Platania-Phung C, et al. The effectiveness of specialist roles in mental health metabolic monitoring: a retrospective cross-sectional comparison study. BMC psychiatry. 2014;14(1):234.

201. Druss BG, von Esenwein SA, Compton MT, Rask KJ, Zhao L, Parker RM. A randomized trial of medical care management for community mental health settings: the Primary Care Access, Referral, and Evaluation (PCARE) study. American Journal of Psychiatry. 2009;167(2):151-9.

202. Osborn DP, Nazareth I, Wright CA, King MB. Impact of a nurse-led intervention to improve screening for cardiovascular risk factors in people with severe mental illnesses. Phase-two cluster randomised feasibility trial of community mental health teams. BMC health services research. 2010;10(1):61.

203. Rethink Mental Illness. Lethal discrimination: why people with mental illness are dying needlessly and what needs to change. London Rethink Mental Illness 2013

204. Fehily C, Bartlem K, Wiggers J, Wolfenden L, Regan T, Dray J, et al. Systematic review of interventions to increase the provision of care for chronic disease risk behaviours in mental health settings: review

protocol. Systematic reviews. 2018;7(1):67.

205. Duggan M, Chislett W, Calder R. The state of self-care in Australia. Melbourne Australian Health Policy Collaboration 2017.

206. Kerkvliet JL, Wey H, Fahrenwald NL. Cessation among state quitline participants with a mental health condition. Nicotine & Tobacco Research. 2014;17(6):735-41.

207. Lukowski AV, Morris CD, Young SE, Tinkelman D. Quitline outcomes for smokers in 6 states: rates of successful quitting vary by mental health status. Nicotine & Tobacco Research. 2015;17(8):924-30.

208. Segan C, Railton R, Whelan L, Atkin L. How effective is Victoria's Quitline for smokers with mental illness? . Behavioural Research in Cancer Control Conference; Sydney 2015.

209. Tedeschi GJ, Cummins SE, Anderson CM, Anthenelli RM, Zhuang Y-L, Zhu S-H. Smokers with self-reported mental health conditions: a case for screening in the context of tobacco cessation services. PloS one. 2016;11(7):e0159127.

210. Vickerman KA, Schauer GL, Malarcher AM, Zhang L, Mowery P, Nash CM. Quitline use and outcomes among callers with and without mental health conditions: a 7-month follow-up evaluation in three states. BioMed Research International. 2015;2015.

211. Bailey JM, Wye PM, Wiggers JH, Bartlem KM, Bowman JA. Family carers: A role in addressing chronic disease risk behaviours for people with a mental illness? Preventive Medicine Reports. 2017;7:140-6.

212. Bailey JM, Hansen V, Wye PM, Wiggers JH, Bartlem KM, Bowman JA. Supporting change in chronic disease risk behaviours for people with a mental illness: a qualitative study of the experiences of family carers. BMC public health. 2018;18(1):416.

213. Repper J, Carter T. A review of the literature on peer support in mental health services. Journal of Mental Health. 2011;20(4):392-411.

214. Frayne SM, Halanych JH, Miller DR, Wang F, Lin H, Pogach L, et al. Disparities in diabetes care: impact of mental illness. Archives of internal medicine. 2005;165(22):2631-8.

215. Mitchell AJ, Lord O, Malone D. Differences in the prescribing of medication for physical disorders in individuals with v. without mental illness: meta-analysis. The British Journal of Psychiatry. 2012;201(6):435-43.

216. Vasudev K, Martindale BV. Physical healthcare of people with severe mental illness: everybody's business! Mental Health in Family Medicine. 2010;7(2):115.

217. Mitchell AJ, Malone D, Doebbeling CC. Quality of medical care for people with and without comorbid mental illness and substance misuse: systematic review of comparative studies. The British Journal of Psychiatry. 2009;194(6):491-9.

218. Australasian College for Emergency Medicine. Waiting times in the emergency department for people with acute mental and behavioural conditions. West Melbourne 2018.

219. de Hert M, Cohen D, Bobes J, Cetokovich-Bakmas M, Leucht S, Ndetei DM, et al. Physical illness in patients with severe mental disorders. II. Barriers to care, monitoring and treatment guidelines, plus recommendations at the system and individual level. World Psychiatry. 2011;10(2):138-51.

220. Locker D, Allen F. What do measures of 'oral health-related quality of life'measure? Community Dentistry and Oral Epidemiology. 2007;35(6):401-11.

221. British Society for Disability and Oral Health. Oral health care for people with mental health problems: guidelines and recommendations London 2000.

222. Manton D, Foley M, Gikas A, Ivanoski S, McCullough M, Peres M, et al. Australia's Oral Health Tracker: technical paper. Melbourne: Australian Health Policy Collaboration, Victoria University 2018.

223. Khokhar WA, Clifton A, Jones H, Tosh G. Oral health advice for people with serious mental illness. Cochrane Database Syst Rev. 2011(11):CD008802.

224. Kisely S, Baghaie H, Lalloo R, Siskind D, Johnson NW. A systematic review and meta-analysis of the association between poor oral health and severe mental illness. Psychosomatic Medicine. 2015;77(1):83-92.

225. Kisely S. No Mental Health without Oral Health. The Canadian Journal of Psychiatry. 2016;61(5):277-82.

226. Scrine C, Durey A, Slack-Smith L. Enhancing oral health for better mental health: Exploring the views of mental health professionals. International Journal of Mental Health Nursing. 2018;27(1):178-86.

227. Duggan M. Investing in women's mental health: strengthening the foundations for women, families and the Australian economy. Melbourne Australian Health Policy Collaboration 2016

228. Patel V, Chatterji S. Integrating mental health in care for noncommunicable diseases: an imperative for person-centered care. Health Affairs. 2015;34(9):1498-505.

229. Case A, Fertig A, Paxson C. The lasting impact of childhood health and circumstance. Journal of Health Economics. 2005;24(2):365-89.

230. Wohlfarth TD, Van Den Brink W, Ormel J, Koeter MW, Oldehinkel AJ. The relationship between social dysfunctioning and psychopathology among primary care attenders. The British Journal of Psychiatry. 1993;163(1):37-44.

231. Figueroa-Fankhanel F. Measurement of stress. Psychiatric Clinics. 2014;37(4):455-87.

232. Szatkowski L, McNeill A. Diverging trends in smoking behaviors according to mental health status. Nicotine & Tobacco Research. 2014;17(3):356-60.

233. van den Akker M, Buntinx F, Metsemakers JF, van der Aa M, Knottnerus JA. Psychosocial patient characteristics and GP-registered chronic morbidity: a prospective study. Journal of Psychosomatic Research. 2001;50(2):95-102.

234. National Guideline Centre UK. Multimorbidity: Assessment, Prioritisation and Management of Care for People with Commonly Occurring Multimorbidity. 2016.

235. Australian Government. Aboriginal and Torres Strait Islander Health Performance Framework 2014 Report In: Cabinet DotPMa, editor. Canberra DPMC 2014

236. Dainese SM, Allemand M, Ribeiro N, Bayram S, Martin M, Ehlert U. Protective factors in midlife: How do people stay healthy? GeroPsych: The Journal of Gerontopsychology and Geriatric Psychiatry. 2011;24(1):19.

237. McGinty EE, Baller J, Azrin ST, Juliano-Bult D, Daumit GL. Interventions to address medical conditions and health-risk behaviors among persons with serious mental illness: a comprehensive review. Schizophrenia Bulletin. 2015;42(1):96-124.

238. Royal Australian College of General Practitioners. Guidelines for preventive activities in general practice. 9th edn ed. East Melbourne RACGP 2016

239. Annamalai A, Staeheli M, Cole RA, Steiner JL. Establishing an Integrated Health Care Clinic in a Community

Mental Health Center: Lessons Learned. Psychiatric Quarterly. 2018;89(1):169-81.

240. Bartels SJ, Aschbrenner KA, Pratt SI, Naslund JA, Scherer EA, Zubkoff L, et al. Implementation of a lifestyle intervention for people with serious mental illness in state-funded mental health centers. Psychiatric Services. 2018;69(6):664-70.

241. Brown T, McKenna B, Furness T. Impact of a nurse practitioner role on metabolic monitoring completion and referrals for consumers admitted to the intensive care area of an acute inpatient psychiatric unit. International Journal of Mental Health Nursing. 2018;27(1):341-8.

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