ACCESS ECONOMICS Pty Limited

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The economic impact of youth mental illness and the cost effectiveness of early intervention

Report by Access Economics Pty Limited

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GLOSSARY OF COMMON ABBREVIATIONS

ABS	Australian Bureau of Statistics
ACE-MH	Assessing cost effectiveness in mental health
ADHD	Attention Deficit Hyperactivity Disorder
AIHW	Australian Institute of Health and Welfare
AWE	average weekly earnings
BEACH	Bettering the Evaluation and Care of Health
BCR	benefit cost ratio
CBA	cost benefit analysis
CBT	cognitive behaviour therapy
CEA	cost effectiveness analysis
DALY	disability adjusted life year
DCIS	Disease Costs and Impact Study
DSM	Diagnostic and Statistical Manual
DSP	Disability Support Pension
DWL	deadweight loss
EI	early intervention
FEP	first episode of psychosis
GDP	gross domestic product
GP	general practitioner
ICD	International Classification of Diseases
ICER	incremental cost effectiveness ratio
MDD	major depressive disorder
NHS	National Health Survey
NPV	net present value
OBPR	Office of Best Practice Regulation
PBS	Pharmaceutical Benefits Scheme
QALY	quality adjusted life year
RR	relative risk
SDAC	Survey of Disability, Ageing and Carers
SSRI	selective serotonin re-uptake inhibitors
TAU	treatment as usual
US	United States
VSL(Y)	value of a statistical life (year)
WHO	World Health Organization
WTA	willingness to accept
WTP	willingness to pay
YLD	years of healthy life lost due to disability
YLL	years of life lost due to premature death

EXECUTIVE SUMMARY

Nearly a quarter (24.3%) of Australian youth - people aged 12-25 years - have anxiety, affective or substance use disorders, and a variety of other mental illnesses[1].

- **There are just over 1 million people aged 12-25 with a lifetime diagnosis of a mental illness who have experienced symptoms within the last 12 months (478,000 males and 526,000 females).**

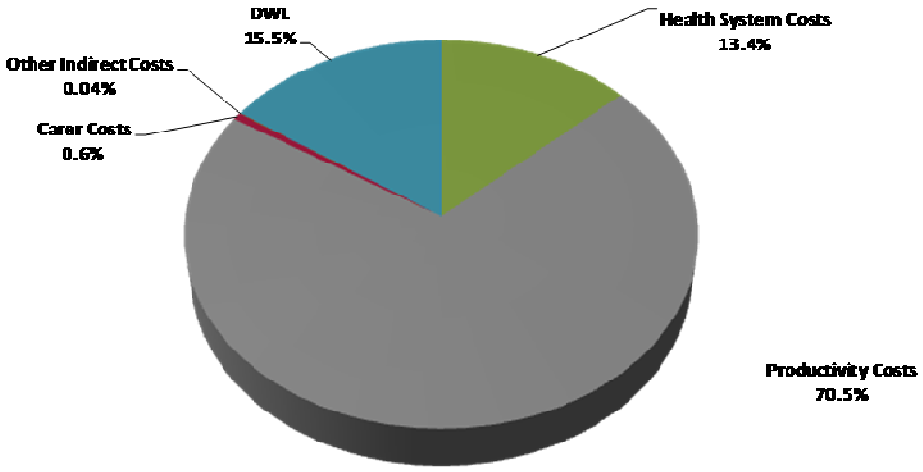
Australia faces substantial costs arising from mental illness in young people. In 2009, the **financial cost of mental illness in people aged 12-25 was $10.6 billion**. Of this:

- $7.5 billion (70.5%) was productivity lost due to lower employment, absenteeism and premature death of young people with mental illness;
- $1.6 billion (15.5%) was the deadweight loss (DWL) from transfers including welfare payments and taxation forgone;
- $1.4 billion (13.4%) was direct health system expenditure; and
- $65.5 million (0.6%) was other indirect costs comprising informal carer costs and the bring-forward of funeral costs.

Additionally, **the value of the lost wellbeing (disability and premature death) was a further $20.5 billion**.

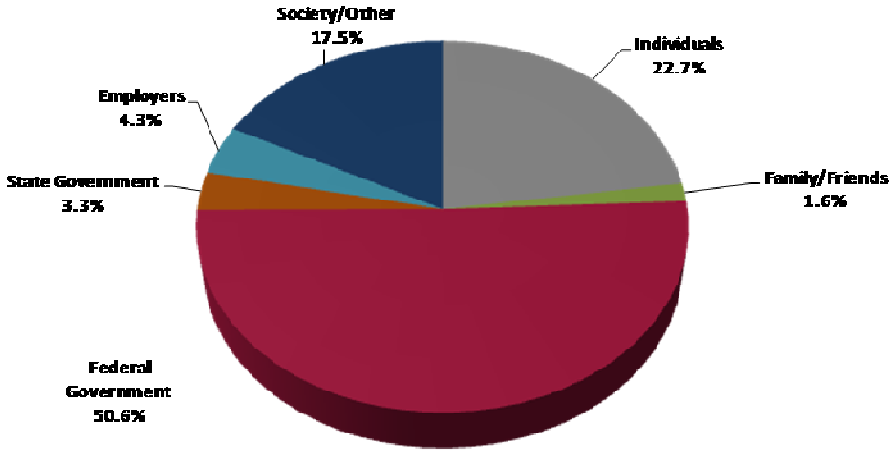
- This amounts to a financial cost of $10,544 per person with mental illness aged 12-25 per year. Including the value of lost wellbeing, the cost is estimated as $31,014 per person per year.

FINANCIAL COSTS OF MENTAL ILLNESS, BY TYPE OF COST (% TOTAL)



[1] Specifically childhood, eating, personality and psychotic disorders.

FINANCIAL COSTS OF MENTAL ILLNESS, BY BEARER (% TOTAL)



Individuals aged 12-25 with mental illness bear 22.7% of the financial costs, and their families and friends bear a further 1.6%. The Australian government bears 50.6% of the financial costs (mainly through taxation revenues forgone and welfare payments). State and territory governments bear around 3.3% of the costs, while employers bear 4.3% and the rest of society pays the remaining 17.5%.

If the burden of disease (lost wellbeing) is included, individuals bear 73.7% of the costs and the Australian government bears 17.2%, state/territory governments 1.1%, with family and friends bearing 0.5%, employers 1.4%, and others in society 5.9%.

Australian Bureau of Statistics (ABS) data show that young people aged 16-24[2] who had mental illness received less treatment than the all-age population with mental illness.

- Of the all-age population with mental illness, 35% received some treatment. However, only around 25% of people with mental illness aged 16-24 received any treatment.
- Only 15% of males aged 16-24 received any treatment for their mental illness, which is concerning given the relatively high number of suicides in this age group.

A number of Australian studies have assessed the efficacy and cost effectiveness of alternative interventions for mental illness, compared to current care interventions. Andrews et al (2004) found that current treatment averted only 13% of the burden of mental illness. Partly this reflects that, while many mental illnesses are chronic, current treatment often consists mainly of managing symptoms of a current episode. Access Economics updated costs from Andrews et al (2004) to 2009, and applied these unit costs only to young people aged 12-25 with mental illness.

- **Results show that current treatment is worth undertaking, resulting in annual net benefits to society of $3.74 billion, and a benefit to cost ratio (BCR) of 3.26 to 1. Current treatment costs $62,420 per disability adjusted life year (DALY) averted, which is classified as cost effective by World Health Organization (WHO) measures.**

[2] Although this study's target age group was 12-25 years, some data were only available for a subset of this age range.

- **However, moving to best practice treatment is considerably more effective. Applied to current patients, the net benefit increases to $5.74 billion per year and the BCR increases to 5.6:1. Dollars per DALY averted falls to $36,399, which is highly cost effective by WHO standards.**

In terms of the incremental cost effectiveness ratio (ICER), best practice treatment at current coverage dominates current practice at current coverage, as it both costs less and results in more DALYs being averted.

- **The extra DALYs averted by moving from current practice and current coverage to providing best practice to everyone with mental illness could cost as little as $6,640/DALY.**

Andrews et al (2004) estimated that even best practice treatment, if applied to 100% of the population with mental illness, would still only avert 40% of the burden of disease. This underscores the importance of prevention and early intervention, for example to prevent a second episode of psychosis from occurring (Access Economics, 2008).

Early and preventive interventions show promise in reducing the burden of mental illness, particularly in young people. Kessler et al (2005) report that in the United States, half of all serious mental health and substance use disorders commence by the age of 14, and three-quarters before the age of 25.

- Thus, preventively oriented interventions targeted to young people aged 12-25 have the capacity to generate greater personal, social and economic benefits than intervention at any other time in the lifespan.

Most governments around Australia have yet to recognise youth mental health as a discrete, unified program area. State and territory specialist mental health services have, in the main, followed a paediatric/adult split in service delivery, mirroring physical health care. There have been some recent developments that have specifically focussed on a more strategic approach to meeting young peoples' mental health needs including the Australian Government's 'Headspace' program (The National Youth Mental Health Foundation), the Victorian Government's 2009 -19 Mental Health Reform Strategy and the NSW Government's investment of growth funding for a youth mental health model. However, systematic coverage remains a long way off.

There have been comparatively few studies of the effectiveness of prevention and youth mental illness in Australia, fewer still of early intervention and seemingly none providing sufficient information to conduct cost effectiveness analysis.

In order to conduct an economic evaluation of the cost effectiveness of prevention/early intervention initiatives, two elements are needed – a measure of costs and a measure of benefits. Data for such measures ideally should be collected as part of routine performance reporting. The aim of an evaluation would not just be to determine the cost effectiveness of the program at hand; but also how well it ranks compared to existing treatment options. There is a need for more such research in this area in order to identify cost effective methods for preventing and treating youth and other mental illness in Australia.

Access Economics
June 2009

1. INTRODUCTION

Access Economics was commissioned by the headspace Centre of Excellence in Youth Mental Health, part of Orygen Youth Health Research Centre to estimate the cost of youth mental illness in Australia and the potential cost effectiveness of early intervention in youth mental health.

The report is structured as follows.

- The rest of this chapter provides background information on mental illness and how it directly affects youth.
- Chapter 2 presents the current prevalence of mental illness in Australia by age and gender.
- Chapters 3 and 4 respectively discuss the health system costs and other financial costs associated with mental illness. Other financial costs include productivity losses (due to lower employment rates, worker absenteeism and premature death), carer and other costs, as well as deadweight (efficiency) losses (DWLs) from transfer payments, such as government welfare and income support payments.
- Chapter 5 presents the 'burden of disease' estimates, which refers to the years of healthy life lost due to disability and premature mortality caused by mental illness, and is measured by disability adjusted life years (DALYs)
- Chapters 6 and 7 examine the types of interventions and the cost effectiveness of early intervention to treat and prevent a larger proportion of mental illness in people aged 12-25 years in Australia.
- Chapter 8 summarises the costs by type of cost and who bears them, compares mental illness with other diseases, and draws conclusions from the analysis of cost effective interventions to develop a set of recommendations for Australian and state/territory governments, building on strategies recommended in previous evidence-based reviews.

1.1 TYPES OF MENTAL ILLNESS

The World Health Organization (WHO, 2005) states that the term 'mental disorder' broadly covers mental illness, mental retardation, personality disorders and substance dependence. The WHO's *International Classification of Diseases – Tenth Revision* (ICD10) defines a mental illness as 'the existence of a clinically recognisable set of symptoms or behaviours associated in most cases with distress and with interference with personal functions'.

- This report uses the term 'mental illness' to describe all mental disorders.

The American Psychiatric Association (2009) *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV) characterises mental illness as 'a clinically significant behavioural or psychological syndrome or pattern that occurs in an individual and is associated with present distress, disability or significant increased risk of suffering'.

- At the start of the 20th century there were only a dozen recognized mental health conditions. By 1952 there were 192, and the DSM-IV today lists 374.

For modelling purposes Access Economics has categorised mental illness into six categories:

- substance abuse disorders;

- anxiety disorders;
- affective disorders;
- bipolar disorder;
- schizophrenia; and
- other mental illness.

The first three categories of mental illness are all highly prevalent, with prevalence rate estimates based on the 2007 Australian Bureau of Statistics (ABS) National survey of mental health and wellbeing (ABS, 2008).

Anxiety disorders are disorders in which 'anxiety is a predominant feature' (American Psychiatric Association, 2009) such as panic disorder, obsessive-compulsive disorder, a phobia, or generalised anxiety disorder. As a group, anxiety disorders are the most common form of mental illness in Australia, with a prevalence rate of 14.4% in 2007 (ABS, 2008).

Depression and related affective disorders are defined in the ICD10 as: 'a lowering of mood, reduction of energy, and decrease in activity. Capacity for enjoyment, interest, and concentration is reduced, and marked tiredness after even minimum effort is common. Sleep is usually disturbed and appetite diminished. Self-esteem and self-confidence are almost always reduced and, even in the mild form, some ideas of guilt or worthlessness are often present. The lowered mood varies little from day to day, is unresponsive to circumstances and may be accompanied by so-called 'somatic' symptoms, such as loss of interest and pleasurable feelings, waking in the morning several hours before the usual time, depression worst in the morning, marked psychomotor retardation, agitation, loss of appetite, weight loss, and loss of libido.' Mood/affective disorders are the second most common form of mental illness in Australia, with a prevalence rate of 6.2% in 2007 (ABS, 2008).

Substance abuse disorders are defined in common parlance as 'the overindulgence in and dependence on a psychoactive drug, leading to effects that are detrimental to the individual's physical or mental health, or to the welfare of others' (Anderson et al 1998). Substance abuse disorders are the third most prevalent subgroup of mental illness, affecting 5.1% of the population in 2007 (ABS 2009). Alcohol abuse is more common than other forms of drug abuse e.g. of narcotics or hallucinogens. Smoking is not classified as a substance abuse disorder.

Important lower prevalence mental illnesses are schizophrenia and bipolar disorder (both psychotic conditions), with the residual category 'other'. While bipolar disorder and schizophrenia are both low-prevalence conditions, they have very high costs. Between them, these two conditions account for the majority (53%) of all psychiatric care days in Australia[3].

Schizophrenia is a mental illness characterised by impairments in the perception or expression of reality and by significant social or occupational dysfunction, as defined in the ICD10. A person with schizophrenia typically demonstrates disorganised thinking, as well as experiencing delusions or hallucinations.

- Data for schizophrenia were not independently estimated in ABS (2008) and thus the prevalence rate is estimated from Begg et al (2007) from the Australian Institute of Health and Welfare (AIHW).

[3] AIHW Mental health admitted patients data cube (2003-04). http://www.aihw.gov.au/cognos/cgi-bin/ppdscgi.exe?DC=Q&E=/AHS/mental_health_98-04_1.

Bipolar disorder is defined as any of several mood disorders characterised usually by alternating episodes of depression and mania or by episodes of depression alternating with mild non-psychotic excitement (ICD10).

- Data for bipolar disorder were also not independently estimated in ABS (2008) and thus the prevalence rate is estimated from Begg et al (2007).

Other mental illness is defined here as all mental illness not captured in the above five categories. Begg et al (2007) includes in this category personality disorders, eating disorders, anorexia nervosa, bulimia nervosa, childhood conditions, attention-deficit hyperactivity disorder and autism spectrum disorders.

1.2 MENTAL ILLNESS IN YOUTH

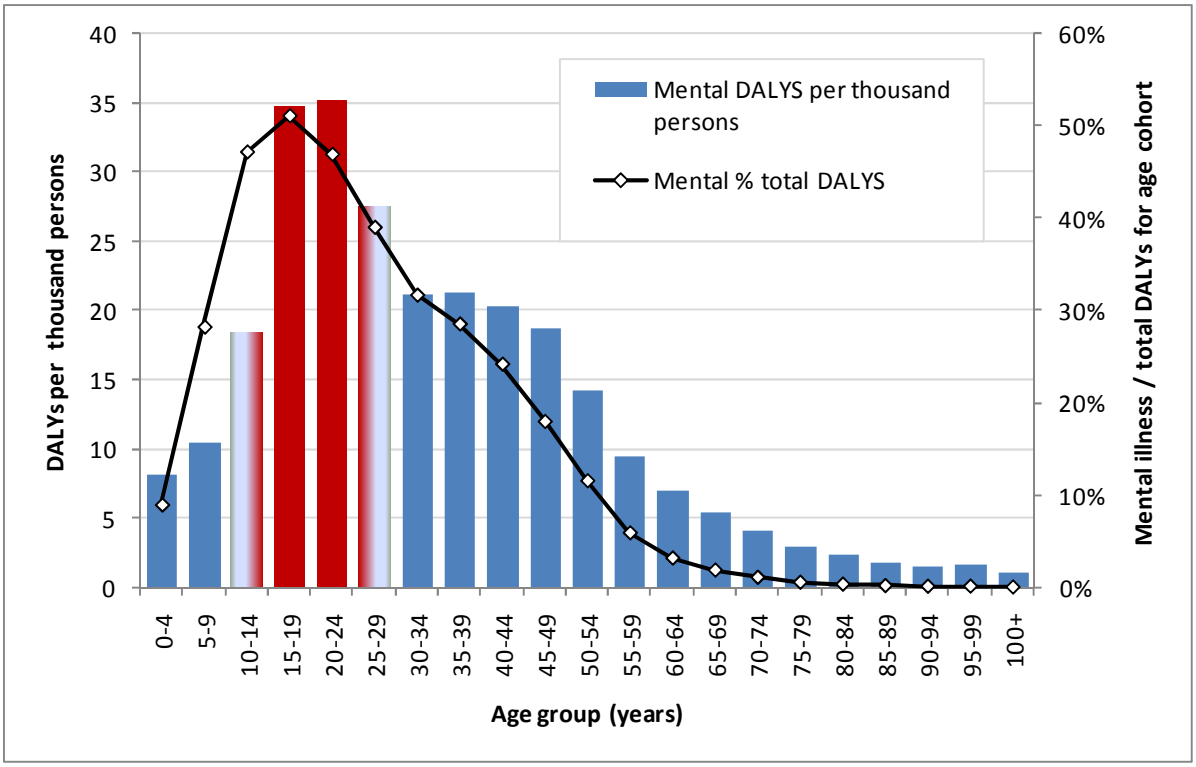
The peak onset for mental illness is in youth (Kessler et al, 2005), and mental illness is the most common health issue affecting youth. For some young people, mental health symptoms remit and do not recur, but for others the symptoms lead to the development of a mental illness. Many of these disorders go untreated, leaving individuals vulnerable to debilitating symptoms which may affect their functioning in their most productive years. Young people have a higher failure to make initial treatment contact for mental illness as they often do not know how to describe their symptoms or where to seek advice. Also, they tend to be physically healthy, so are no accustomed to consulting general practitioners (GPs), who are the gate-keepers to accessing mental health care.

Young people are also the hardest hit by treatment delays and many who seek help often fail to receive effective evidence-based treatment. Andrews et al (2004) found that less than a third of Australians with depression receive efficacious treatment and only 10% to 20% of the young people with mental health issues receive treatment. Failure to access treatment is particularly detrimental in youth, a time of important growth and development milestones, including educational attainment and career and family building. Young adults with mental illness are also at greater risk of suicide, self-harm and substance addiction. The scope to reduce the burden through provision of correct diagnosis in youth and evidence-based treatment is thus potentially very large.

Mental illness in childhood and adolescence creates a significant clinical and social burden on the individual, their family and society. Figure 1-1 shows the share of the burden of disease attributable to mental illness in different age cohorts. For older teens (15-19 years) mental illness in 2003 accounted for the majority (51%) of the total burden from all diseases and injuries. For young teens (10-14) and young adults (20-24) mental illness in 2003 accounted for almost half their total ill health (47% in both cases). Young people in their teens and twenties[4] lose over three times as many DALYs per person to mental illness compared to the rest of the population.

[4] Measured here as the age groups 10-14 through to 25-29.

FIGURE 1-1: MENTAL ILLNESS DALYS, BY AGE, 2003



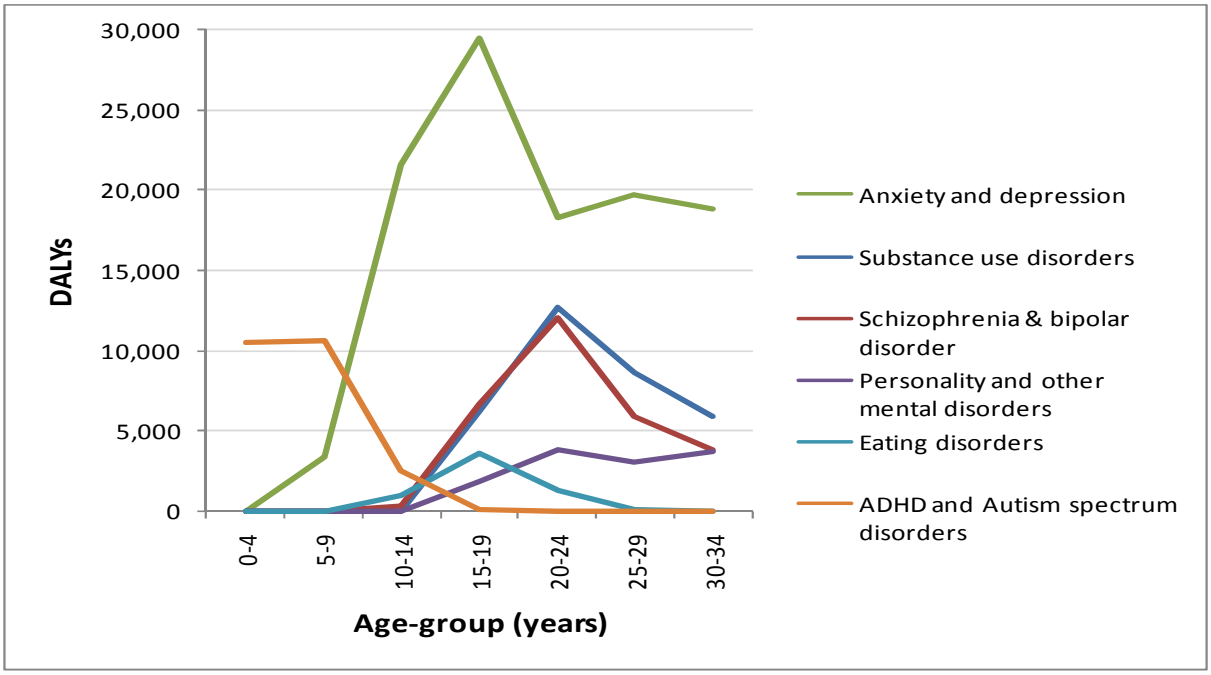
Source: Begg et al (2007).

Figure 1-2 shows the burden of disease attributable to each category of mental illness. Depression and anxiety disorders account for most (57%)[5] of the burden of mental illness in youth[6]. Schizophrenia and bipolar disease, although being less prevalent, cause greater total loss of health in people under 25 years than does substance abuse. This is due to high severity in the small proportion of people with mental illness who have schizophrenia and bipolar disorder.

[5] The ABS reports anxiety and depression as separate categories,

[6] The focus group in this study are those aged 12- 25 years. Because AIHW mental health data are only available in five year cohorts, the proxy here is the 10-24 age group.

FIGURE 1-2: BURDEN OF MENTAL ILLNESS, BY AGE AND DISORDER, 2003



Source: Begg et al (2007).

The final sections of this report focus on cost effectiveness of intervening and treating a larger proportion of emerging and diagnosed mental illness in young people in Australia. While mental illness accounts for 13% of the disease burden in Australia, it receives about half that (7%) as a share of health expenditure (Department of Health and Ageing, 2007). Andrews and the Tolkien II Team (2006) estimated that a 30% increase in mental health funding could double current levels of coverage, from around 30% of all mental health consumers (all ages) to 60%.

If mental illness can be diagnosed and treated early, the sharp increase in its prevalence in young adults may be reduced. Effective diagnosis and intervention will reduce the burden of disease and allow many Australians to lead happier and more productive lives. If mental illness is left undiagnosed and untreated in youth, its prevalence in adults in later years is expected to be higher, creating a greater burden on the individual and society.

1.3 METHODOLOGICAL OVERVIEW

Access Economics utilises a prevalence approach to estimating the costs of mental illness, as the data sources generally lend themselves to utilisation of such as approach, and this avoids uncertainty surrounding estimates of future treatment costs associated with the alternative incidence approach. Prevalence is the 'stock' of a condition in a population in a given period, while incidence reflects the 'flow' into the population over a period. As mental illness is a long term condition, this report is interested in assessing its impact on the Australian economy in one year (2009).

Conceptual issues relating to the classification of costs include the following:

- **Direct and indirect costs**: Although literature often distinguishes between direct and indirect costs, the usefulness of this distinction is dubious, as the specific costs included in each category vary between different studies, making comparisons of results somewhat difficult. This report refers to health system expenditures as direct costs and other financial costs as indirect costs.

- **Real and transfer costs**: Real costs use up real resources, such as capital or labour, or reduce the economy's overall capacity to produce (or consume) goods and services. Transfer payments involve payments from one economic agent to another that do not use up real resources. For example, if a person loses their job, as well as the real production lost there is also less income taxation, where the latter is a transfer from an individual to the government. This important economic distinction is crucial in avoiding double-counting.
- **Financial and non-financial costs:** Financial costs encompass loss of goods and services that have a price in the market or that can be assigned an approximate price with some certainty. 'Non-financial' costs include the loss of wellbeing of a person. Greater uncertainty tends to surround the valuation of non-financial costs, so results should be presented and interpreted cautiously.

There are **six types of costs** calculated.

1 **Health system expenditure** (Chapter 3) comprises the costs of running hospitals, general practitioner (GP) and specialist services reimbursed through Medicare and private funds, the cost of pharmaceuticals funded through the Pharmaceutical Benefits Scheme (PBS) and privately and including over-the-counter medications, allied health services, research and 'other' direct costs (such as health administration).

2 **Productivity costs** (Chapter 4) include the person's productivity losses (temporary absenteeism, long-term employment impacts and unpaid work), premature mortality and the value of informal care.

3 **Other financial costs** (Chapter 4) can include all other government and non-government programs and out-of-pocket expenses (such as formal care, aids, transport and accommodation costs associated with receiving treatment) and the bring-forward of funeral costs. However, only the latter cost element was able to be estimated in this study due to lack of robust data or lack of relevance for the target age group.

4 **Transfer costs** (Chapter 4) comprise the deadweight losses (DWLs) associated with government transfers, such as taxation revenue forgone, welfare and disability payments.

5 **Non-financial costs** (Chapter 5) are also very important—the pain, suffering and premature death that result from mental illness. Although more difficult to measure, these can be analysed in terms of the years of healthy life lost, both quantitatively and qualitatively, known as the burden of disease.

Costs of mental illness are borne by different individuals or sectors of society. Clearly the person bears costs, but so do employers, government, friends and family, co-workers, charities, community groups and other members of society.

It is important to understand how costs are shared in order to make informed decisions regarding interventions. From the employer's perspective, depending on the impact of mental illness, work loss or absenteeism will lead to costs such as higher wages (i.e. accessing skilled replacement short-term labour) or alternatively lost production, idle assets and other non-wage costs. Employers might also face costs such as rehiring, retraining and workers' compensation.

While it may be convenient to think of these costs as being purely borne by the employer, in reality they may eventually be passed on to end consumers in the form of higher prices for goods and services. Similarly, for the costs associated with the health system and community services provided to the person, although the government meets this cost, taxpayers

(society) are the ultimate source of funds. However, for the purpose of this analysis, a 'who writes the cheque' approach is adopted, falling short of delving into second round or longer term dynamic impacts. Society bears both the resource cost of providing services to people, and also the DWLs (or reduced economic efficiency) associated with the need to raise additional taxation to fund the provision of services and income support.

Typically **six groups who bear costs** and pay or receive transfer payments are identified:

1 **people** with mental illness;

2 **friends and family** (including informal carers);

3 **employers**;

4 **Australian government**;

5 **state and local government**; and

6 **the rest of society** (non-government, i.e. not-for-profit organisations, workers' compensation groups and so on).

Classifying the six cost categories and six groups enables a framework for analysis, as shown in Table 1-1.

TABLE 1-1: EXAMPLE TYPES OF COSTS ASSOCIATED WITH MENTAL ILLNESS

Conceptual group	Subgroups	Bearers of Cost	Comments
Burden of disease	Years of life lost due to disability (YLD) Years of life lost due to premature death (YLL)	Person*	The value of a statistical life (VSL) implicitly includes costs borne by the individual. Thus the net value of burden of disease should exclude these costs to avoid double counting.
Health system costs	Costs by type of service eg, hospital inpatients, pharmaceuticals, GPs, allied health etc.	Person*, governments and society (private health insurers, workers' compensation)	
Productivity costs			
	Lost productivity from temporary absenteeism (time off work)	Person, employer and government#	
	Long-term lower employment rates	Person and government#	Includes premature retirement
	Premature death	Person and government#	Loss of productive capacity
	Additional search and hiring replacement	Employer	Incurred when prematurely leave job
	Lost unpaid work of person	Person	Includes housework, yardwork, childcare and volunteer work
	Lost informal carer productivity	Friends and family, and employer#	Includes both paid and unpaid work
Other financial costs			
	Cost of care, aids, equipment, modifications, etc	Person, government and society	Not estimated in this study
	Funeral costs brought forward	Friends and family	
Transfer costs	DWL	Society	Relate to transfers from taxation, welfare etc

* Friends/family may also bear loss of wellbeing, health costs and lower living standards as a result of the individual's mental illness; however, care is needed to assess the extent to which these are measurable, additional (to avoid double counting) and not follow-on impacts. For example, a spouse may pay a medical bill and children may share in lower household income if the person's work hours are reduced – but as this is simply redistribution within family income it is not measured here.

Where earnings are lost, so is taxation revenue and frequently also there are other transfers, such as workers' compensation or welfare payments for disability/sickness/caring etc, so Governments share the burden.

There are essentially two ways of estimating each element of cost for each group:

- **top-down:** these data may provide the total costs of a program element (e.g. health system); or
- **bottom-up:** these data may provide estimates of the number of cases in the category ('n') and the average cost for that category; the product is the total cost (e.g. the wage rate for lost earnings multiplied by the reduction in employment, and the number of people to whom this applies).

It is generally more desirable to use top-down national datasets in order to derive national cost estimates to ensure that the whole is not greater or less than the sum of the parts. On the other hand, it is often difficult to obtain top-down estimates. In this report the top-down

approach is applicable to health system and burden of disease costs and the bottom-up approach applies in other cases.

- Data on health system costs and burden of disease are derived from the AIHW, which in turn are based on other data sources, such as the Australian Hospital Statistics and Bettering the Evaluation and Care of Health (BEACH) data for GP costs.
- Data on other financial costs are drawn from a variety of sources, for example the ABS National Health Survey 2004-05, the ABS National Survey of Mental Health and Wellbeing 2007, and the ABS Survey of Disability, Ageing and Carers 2003.

2. PREVALENCE OF YOUTH MENTAL ILLNESS

This report utilises the prevalence approach (annual costs) to estimating the costs of youth mental illness, as the data sources generally lend themselves to utilisation of such an approach, and as this avoids the uncertainty surrounding estimates of future treatment costs associated with the alternative incidence (lifetime costs) approach.

> Prevalence refers to the number of people with a mental illness in a population age-group at a given point of time or over a certain period of time (one year prevalence is measured in this study).

There are two principle sources of prevalence information for mental illness. The ABS provides the *National Survey of Mental Health and Wellbeing 2007* (ABS, 2009), and the AIHW provides *The Burden of Disease and Injury Australia, 2003* (Begg et al, 2007). The AIHW's coverage is more comprehensive, both in terms of diseases and age groups, but the ABS data are more recent.

- It is important to have recent data where possible, as the prevalence of mental illness can change over time.
- The ABS chose diseases that were a) sufficiently widespread as to be able to yield meaningful national results from a limited survey, and b) of a nature that enabled detection by such a survey.
- Most of the AIHW's data came from the first (and only other) mental health survey that the ABS conducted in 1997. This survey included childhood, psychotic and personality disorders; conditions not included in the 2007 survey. The AIHW sourced the prevalence of eating disorders from epidemiological studies.

Accordingly, Access Economics has used ABS data for those ages (16 and over) and diseases (affective disorders, anxiety disorders and substance abuse disorders) and relied on the AIHW for everything else (Table 2-1).

TABLE 2-1: SOURCES OF PREVALENCE DATA

Disease	Ages under 16	Ages 16 and over
Anxiety disorders	AIHW	ABS
Affective disorders	AIHW	ABS
Substance use disorders	AIHW	ABS
Childhood disorders	AIHW	AIHW
Eating disorders	AIHW	AIHW
Psychotic disorders	AIHW	AIHW
Personality disorders	AIHW	AIHW

While the majority of disease categories are sourced from (older) AIHW data, the vast majority of people with mental illness fall within the categories covered by (more recent) ABS data (Table 2-2), since these are the high prevalence conditions.

TABLE 2-2: PREVALENCE OF MENTAL ILLNESS, PEOPLE AGED 15 AND OVER (2007)

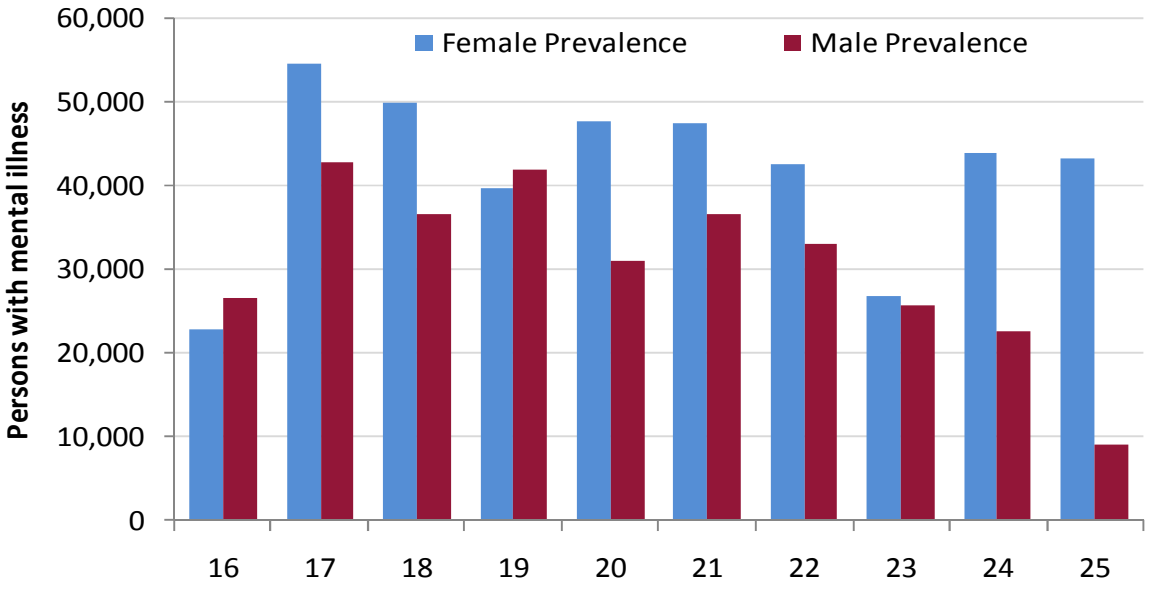
Category	Prevalence
Anxiety disorders	14.4%
Affective disorders	6.2%
Substance use disorders	5.1%
Total people with disorders covered by ABS[#]	**20.0%**
Personality disorders	2.6%
Childhood disorders	0.6%
Schizophrenia	0.5%
Eating disorders	0.1%
Total people with other disorders (AIHW)	**3.9%**
Total mental illness	**23.9%**

Notes: [#] ABS individual mental disorder data are based on cases and do not sum due to comorbidities, however, the ABS total is for people. AIHW data are based on people and therefore it is possible to sum both ABS and AIHW totals together. ABS data are for 2007 and covers ages 16 and over - it is assumed that people aged 15 have the same prevalence as people ages 16-19. AIHW data are for 2003 – the latest data available – and covers people 15 and over. This conservatively assumes that AIHW prevalence has not changed since 2003.
Sources: ABS (2009), AIHW (Begg et al, 2007).

Prevalence estimates for the six categories of youth mental illnesses were derived by Access Economics by combining 2003 AIHW data and 2007 ABS data. The 2003 AIHW data calculated the prevalence rates of the mental illnesses by five year age groups, and thus were more useful for obtaining data relating specifically to youth aged 12-25.

The 2007 published data were more limited, as they were only provided in ten year age groups and data were only provided for anxiety, affective and substance abuse disorders. However, data obtained from the ABS by special request enabled calculation of prevalence by individual years for the target population (Figure 2-1).

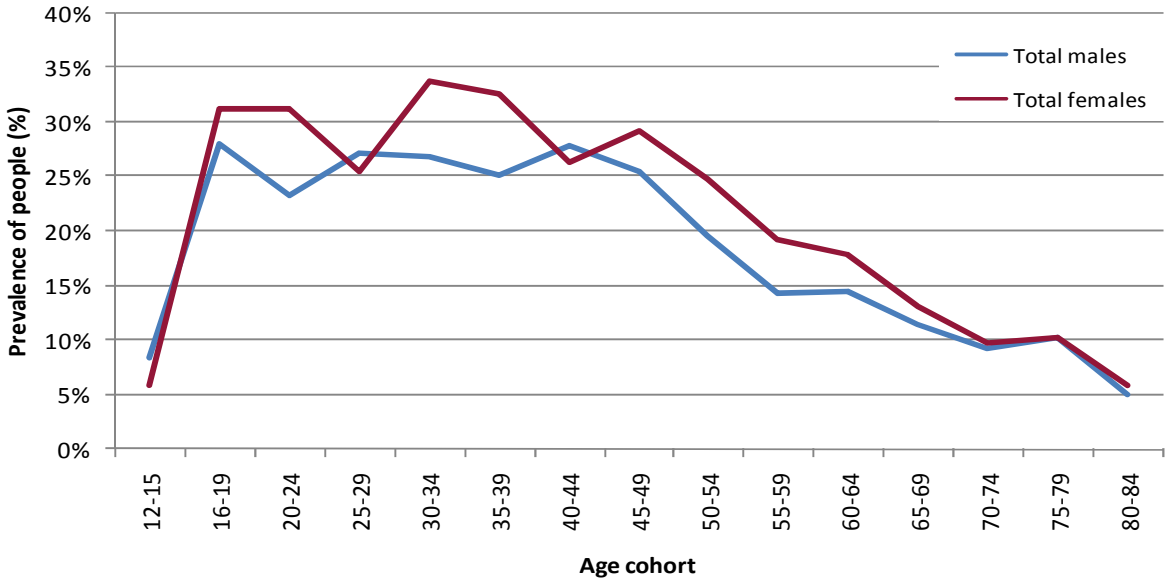
FIGURE 2-1: PREVALENCE OF COMMON MENTAL ILLNESS* (AGES 16-25)



Source: ABS (2009) and special data request. *Common mental illnesses are defined here as anxiety, affective and substance use disorders only. Excludes personality, eating, childhood and psychotic disorders.

Figure 2-2 shows the prevalence of people diagnosed with mental illness in 2009, in particular the high prevalence between the ages of 16 and 25. Females aged 16-19 years have a 31.1% chance of having a mental illness, and males aged 16-19 have 28.0% likelihood of mental illness. Importantly the sharp increase in prevalence from 12-15 to 16-19 highlights that onset occurs mainly in youth.

FIGURE 2-2: MENTAL ILLNESS, PREVALENCE RATES BY AGE AND GENDER, AUSTRALIA, 2009



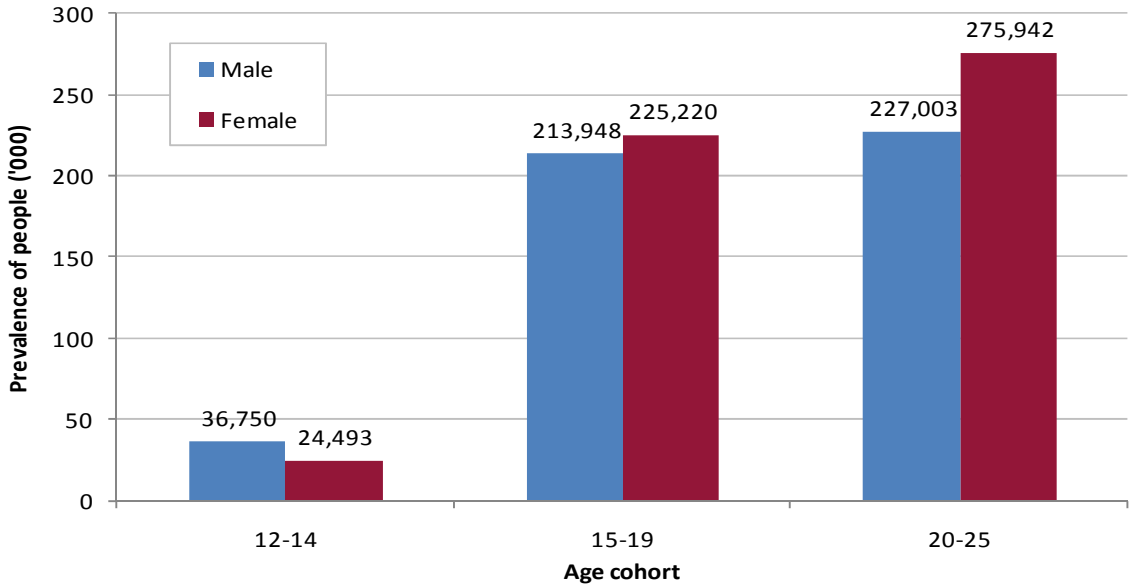
Source: Access Economics, based on Begg et al (2007) and ABS (2009) data.

There is a high degree of comorbidity with mental illness (people can experience more than one type of mental illness, for example substance abuse and anxiety). The ABS (2009) reports there are 1.7 cases of mental illness for every person with mental illness. The AIHW only reports on people with mental illness and not cases.

In 2009, there are just over 1 million people aged 12-25 with mental illness (478,000 males and 526,000 females).

- This equates to 24.3% of all Australians aged 12-25 in 2009.

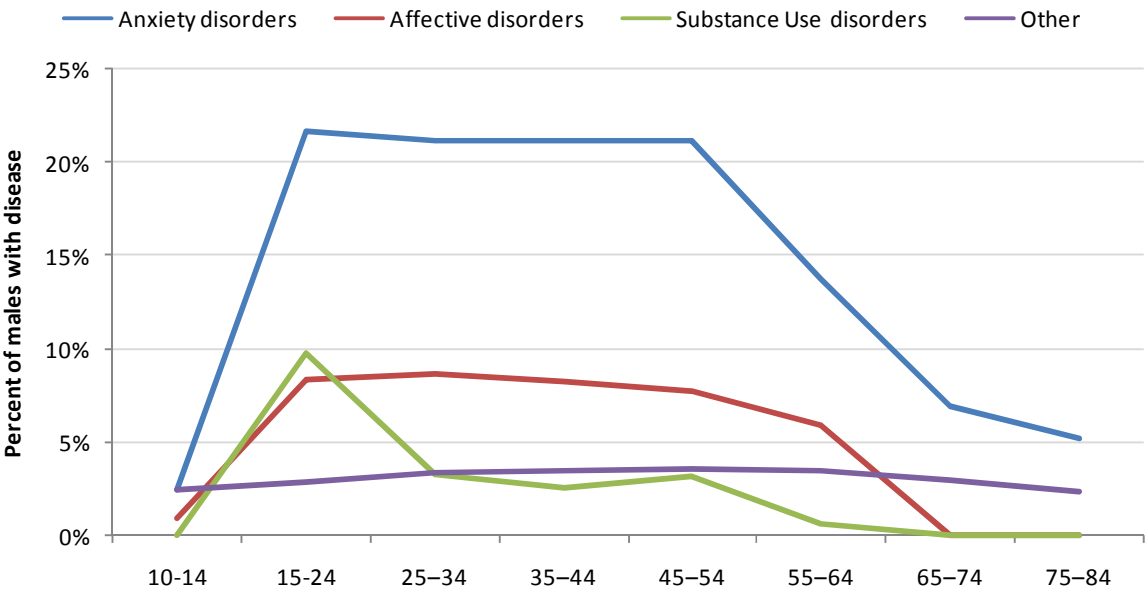
FIGURE 2-3: MENTAL ILLNESS, NUMBER OF PEOPLE, AUSTRALIA, 2009



Source: Access Economics based on ABS (2009) and Beg et al (2007).

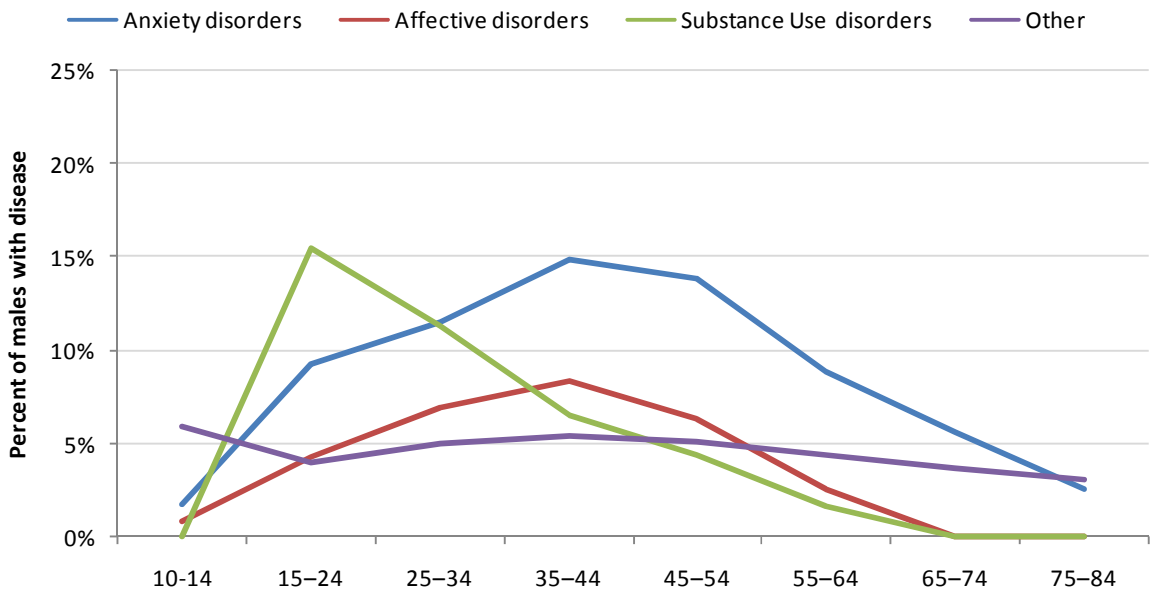
Figure 2-4 and Figure 2-5 disaggregate the prevalence rates (cases) of mental illness by category. The most prevalent type of mental illness in females across nearly all age groups is anxiety. Substance abuse disorders are highly prevalent in females aged 16-24. Substance abuse disorders are also highly prevalent in young men (Figure 2-5). Again, the rapid increase in prevalence between 10-14 and 15-24 emphasises youth onset, after which prevalence may stabilise or decline (with the exception of anxiety and mood disorders in men).

FIGURE 2-4: MENTAL ILLNESS, PREVALENCE RATES (%) FOR FEMALES BY TYPE AND AGE, AUSTRALIA, 2009



Source: ABS (2009) and Begg et al (2007).

FIGURE 2-5: MENTAL ILLNESS, PREVALENCE RATES (%) FOR MALES BY TYPE AND AGE, AUSTRALIA, 2009



Source: ABS (2009) and Begg et al (2007).

For epidemiological readers, numbers behind the above figures are reported in Table 2-3.

- In this table 'Other' mental illness includes schizophrenia as well as eating, childhood, and personality disorders. For anxiety, affective and substance use disorders – the ABS only reports data for 16-19 year olds, as a result we have assumed that 15 year olds have the same prevalence.
- The AIHW reports anxiety and depression together. For 10 to 14 year olds, Access Economics has split this AIHW data into the two separate disorders, using the proportions reported by the ABS for the 16 to 19 cohort (which is the youngest age cohort the ABS includes).

TABLE 2-3: MENTAL ILLNESS, PREVALENCE RATES (%), 2009

MALES	Anxiety disorders	Affective disorders	Substance Use disorders	Other
10-14	1.7%	0.8%	0.0%	5.9%
15–24	9.3%	4.3%	15.5%	4.0%
25–34	11.5%	7.0%	11.3%	5.0%
35–44	14.9%	8.4%	6.5%	5.4%
45–54	13.9%	6.3%	4.4%	5.0%
55–64	8.9%	2.6%	1.6%	4.4%
65–74	5.6%	-	-	3.7%
75–84	2.5%	-	-	3.1%
FEMALES	Anxiety disorders	Affective disorders	Substance Use disorders	Other
10-14	2.5%	1.0%	0.0%	2.5%

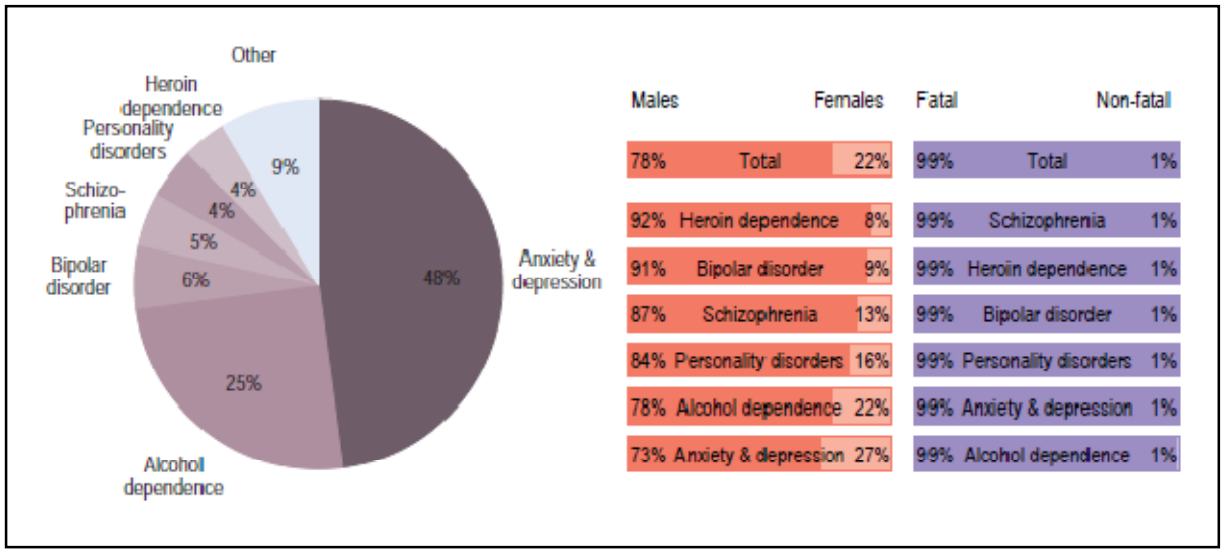
15-24	21.7%	8.4%	9.8%	2.9%
25–34	21.2%	8.7%	3.3%	3.4%
35–44	21.2%	8.3%	2.6%	3.5%
45–54	21.2%	7.8%	3.2%	3.6%
55–64	13.8%	5.9%	0.6%	3.5%
65–74	7.0%	-	-	3.0%
75–84	5.2%	-	-	2.3%

Note "-" indicates figure not published
Source: ABS (2009) and Begg et al (2007) and Access Economics calculations.

2.1 MORTALITY AND SURVIVAL RATES

The AIHW (Begg et al, 2007) provides data on how many people died from suicide as a direct result of mental illness (Figure 2-6).

FIGURE 2-6: SUICIDE BURDEN (DALYS) BY SPECIFIC CAUSE, 2003



(a) Pie chart is the proportion of total. (b) Orange table shows the proportion of specific cause by sex. (c) Purple table shows the proportion due to fatal and non-fatal DALYs. Non-fatal may include loss of quality of life prior to death, for example.

Source: Begg et al (2007).

Begg et al (2007) also provided estimates of the contribution of mental illness to deaths from all causes – suicide, accidental drug overdose, violence/assaults, and so on. Using these data, the number of deaths for each of the six mental illness categories could be estimated, across the five year age brackets for males and females. The relative risk (RR) of mortality attributable to mental illness for males with a mental illness is substantially higher than for females with a mental illness, given the impact of suicides (Table 2-4).

TABLE 2-4: MORTALITY RATES BY MENTAL HEALTH STATUS

Males	**10-14**	**15-19**	**20-24**	**25-29**
in population without mental illness	0.01%	0.05%	0.06%	0.07%
from mental illness, in population with mental illness	0.01%	0.08%	0.09%	0.09%
in population with mental illness	0.02%	0.13%	0.15%	0.16%
Relative risk	1.93	2.69	2.46	2.44
Females	**10-14**	**15-19**	**20-24**	**25-29**
in population without mental illness	0.01%	0.02%	0.03%	0.03%
from mental illness, in population with mental illness	0.02%	0.04%	0.03%	0.03%
in population with mental illness	0.03%	0.06%	0.06%	0.06%
Relative risk	2.79	2.79	2.11	1.96

Source: Derived from Begg et al (2007).

This RR was then applied to the 2009 prevalence estimates of mental illness to calculate that there will be an estimated 772 deaths (all causes) due to mental illness for 12-25 year olds in 2009 (566 males and 206 females).

TABLE 2-5: DEATHS FROM MENTAL ILLNESS (ALL CAUSES)

	Males	Females	Persons
12-14	5	4	10
15-19	236	102	338
20-24	257	86	343
25	68	14	82
Total	566	206	772

Source: Access Economics estimates derived from Begg et al (2007).

3. HEALTH SYSTEM COSTS

This chapter estimates the direct health system expenditure due to mental illness in Australia.

3.1 METHODOLOGY

Estimates for direct health system costs are derived in Australia by the AIHW from an extensive process developed in collaboration with the National Centre for Health Program Evaluation for the Disease Costs and Impact Study (DCIS). The approach measures health services utilisation and expenditure (private and public) for specific diseases and disease groups in Australia. The DCIS methodology has been gradually refined over the 1990s to now estimate a range of direct health costs from hospital morbidity data, case mix data, BEACH data, the National Health Survey (NHS) and other sources. AIHW (2008) provides a summary of the main results of estimates of health expenditures by disease and injury for the year 2004-05. The advantage of a top-down methodology is that cost estimates across diseases will be consistent, enhancing comparisons and ensuring that the sum of the parts does not exceed the whole (total health expenditure in Australia).

The AIHW data include hospital expenditures (including admitted and non-admitted patients) high-level residential care, out-of-hospital expenditure (including GP services, imaging, pathology and medical specialists), pharmaceutical costs (prescription and over-the-counter) and other costs (including other health professionals and research) in 2004-05.

The proportions of health costs borne by each party are based on 2004-05 AIHW data on payers for health system costs by sector (hospital, out of hospital, pharmaceutical and other costs).

3.2 COST CALCULATIONS

AIHW (2008) published allocated health expenditure on mental illness per head of population in 2004-05, by age and gender (Table 3-1).

TABLE 3-1: ALLOCATED MENTAL HEALTH EXPENDITURE PER PERSON BY AGE AND SEX, 2004-05 ($)

	0-4	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+
Males	75	30	205	306	268	220	197	170	227	243
Females	23	47	216	278	273	248	221	237	271	204

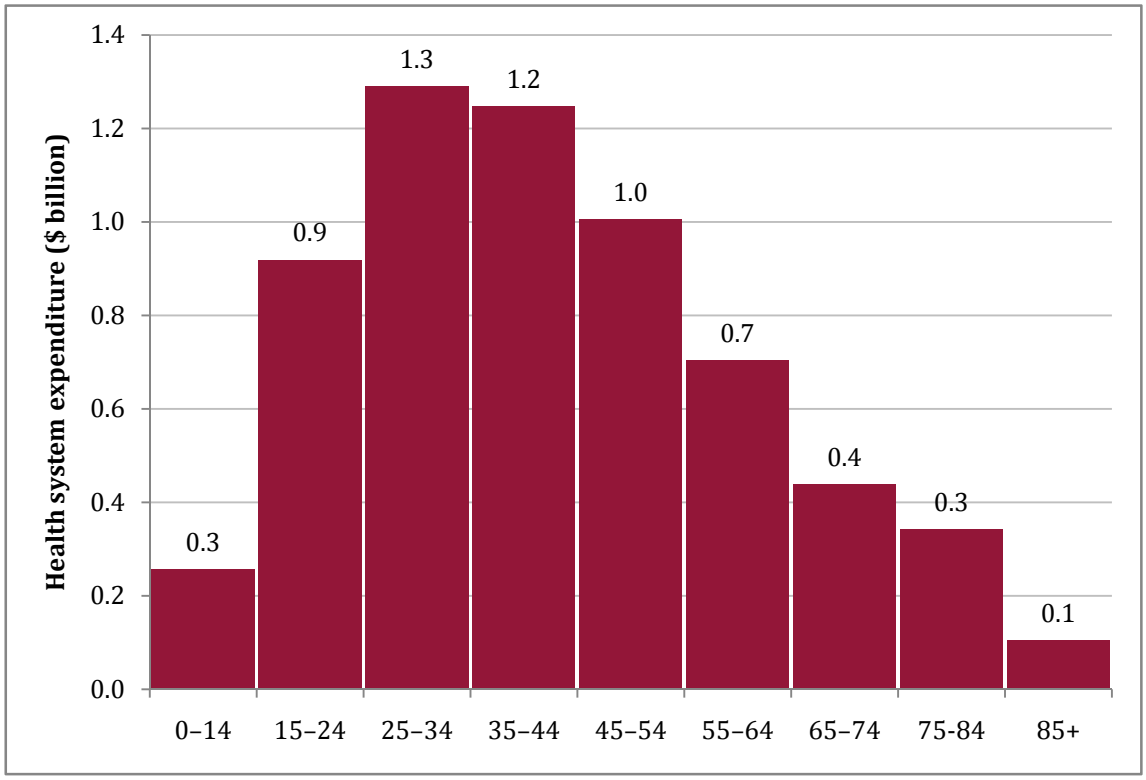
Source: AIHW (2008).

The AIHW cost data in Table 3-1 are then multiplied by the number of people in each age and gender cohort to ascertain total expenditure on mental health.

However, the AIHW include only 65% of total recurrent health expenditure in their estimates of expenditure by disease and injury, referred to as 'allocated' health expenditure. The 'unallocated' remainder (35%) includes capital expenditures, expenditure on community health (excluding mental health), public health programs (except cancer screening), health administration and health aids and appliances. Thus as a final step, allocated health expenditure is factored up by (1/0.65)-1 or 53.8% to obtain total mental health system expenditure per person. The results are reported in Figure 3-1.

- Spending on people with mental illness peaks in the 25-34 year age group which is consistent with the prevalence of the disease – though not with the highest onset age groups, which are younger (recall Figure 2-2).

FIGURE 3-1: TOTAL MENTAL HEALTH EXPENDITURE BY AGE COHORT, $ BILLION, 2004-05



Source: AIHW (2008) and Access Economics Demographic Model.

Dividing the AIHW's total health expenditure by the prevalence of mental illness (from Chapter 2 above)[7] yields expenditure per patient for 2004-05[8].

This expenditure per person is updated for health inflation and population changes and then multiplied by the 2009 prevalence of mental illness in young people aged 12-25.

As a result of these calculations, Access Economics estimates that in 2009 the total health system expenditure for 12-25 year olds with mental illness is approximately $1.41 billion.

The AIHW (2008) reports that total health expenditure paid by the Australian government is 42.9% of the total. State, territory and local governments contribute 24.9%, and individuals, family and friends 17.4% (AIHW, 2008). Health system costs of mental illness for people aged 12-25 years (Table 3-2) are largely borne by the Australian government ($606.8 million) and state, territory and local governments ($352.2 million). Individuals contribute $123.7 million, while society and family/friends make up the remaining $446.1 million.

[7] This assumes that the 2007 prevalences for diseases covered by the ABS, and 2003 prevalences reported by the AIHW were the same in 2004-05.

[8] Access Economics has used ABS prevalences where possible. ABS prevalences are higher than AIHW prevalences (because they are more recent). Hence, dividing (AIHW) total expenditure by ABS prevalence (as done here) yields a lower expenditure per patient, than would division by AIHW prevalences.

TABLE 3-2: MENTAL HEALTH SYSTEM EXPENDITURE BY BEARER, 12-25 YEARS, 2009 ($ MILLION)

Health expenditure	$m	%
Individuals	$123.7	8.7%
Family/Friends	$122.4	8.7%
Federal Government	$606.8	42.9%
State Government	$352.2	24.9%
Society/Other	$209.3	14.8%
Total	**$1,414.4**	**100.0%**

Source: Derived from on AIHW (2008).

4. OTHER FINANCIAL COSTS

As well as direct costs to the health system from mental illness, there are a range of indirect costs such as productivity losses borne by employers and the cost of providing carers to people with mental illness.

- **Productivity losses** occur when a person is absent from work due to ill-health. The productivity loss is the value of the lost production including any premium that has to be paid to a replacement worker (eg, overtime), as well staff turnover costs and retraining in the event that worker is absent from work for an extended period. Different elements of these costs are borne by:
  - the employer – sick leave, the overtime premium for the replacement worker, staff turnover costs and employer 'excess' contributions to compensation payouts;
  - the worker – reduced income after tax and compensation;
  - government – reduced taxation receipts and higher welfare payments (eg, Disability Support Pension - DSP, Sickness Allowance); and
  - society – e.g. compensation payments.
- **Other indirect costs** include items such as:
  - **carer costs** – people who are unwell may require others to care for their needs and this care often does not enter into health system expenditure – for example, an informal (unpaid) family carer assisting with personal care or taking someone to appointments, or a formal sector (paid) carer coming in to perform household tasks;
  - **aids and home modifications** (those not included in health system expenditure) that the person may need to purchase as a result of the disorder, although Access Economics literature searchers did not indicate that people with a mental illness have a greater usage of aids and modifications than the general Australian population, so no additional cost of aids and modifications is attributed to people with a mental illness; and
  - **DWLs** – the redistribution of public sector resources to care for the sick person incurs deadweight costs on society, such as the need to raise additional tax revenues (the revenue itself is a transfer payment, not a real economic cost, but for every dollar of tax raised, about 28.75 cents is absorbed in the distortions induced and the administration of the tax system) and to finance welfare payments.

4.1 PRODUCTIVITY LOSSES

Productivity losses are the cost of production that is lost when people with mental illness are unable to work because of the condition. They may work less than they otherwise would (either being employed less, being absent more often or being less productive while at work) or they may die prematurely. Access Economics adopts a human capital approach to measurement of productivity losses in developed countries.

- Data for productivity costs were obtained from the ABS NHS, which provides estimates of employment participation and absenteeism from work attributable to mental illness.
- There may also be productivity losses in the longer term due to the impact of youth mental illness on schooling (eg, through absenteeism, dropout rates, difficulty learning). However, there were inadequate data to estimate the long run productivity impact via this pathway.

4.1.1 EMPLOYMENT PARTICIPATION

Mental illness can affect a person's ability to work. Similarly a person's ability to find a job and do their job well can be inextricably linked to their self esteem and can exacerbate mental illness such as depression or anxiety.

If employment rates are lower for people with mental illness, this loss in productivity represents a real cost to the economy. The employment rate is calculated by dividing the total number of employed people by the number of people in each age-gender group. This calculation can be made for people with mental illness and then compared with the employment rate for people without mental illness in corresponding age-gender groups. The difference (or excess) between the two groups can then be attributed to mental illness.

NHS data (ABS, 2005) indicated that people with mental illness aged 16-25 had, overall, an employment rate of 57.6%, lower than the employment rate of 70.0% for the population without mental illness of the same age. As a result, the **employment rate was 17.8% lower for people with mental illness** compared to those without.

- It is not the case that fewer youth with mental illness are working because more of them are studying. ABS (2008) data shows that, compared to their mentally healthy counterparts, youth with mental illness are almost equally less likely (13.6%) to be studying as they are less likely to be working[9].

Data on Average Weekly Earnings (AWE) and employment rates for each respective age-gender group were combined to calculate the lost earnings due to reduced employment.

> The annual cost of **lost earnings due to reduced employment from mental illness is estimated as $3.1 billion** in 2009 for people aged 15-25.

This result is consistent with the epidemiology of mental illness – in that it can be a debilitating condition significantly reducing a person's ability to participate in employment.

4.1.2 ABSENTEEISM FROM PAID AND UNPAID WORK

For people with mental illness who are employed, the condition can adversely affect work performance through absence from work. Such absenteeism is measured by looking at the number of work days missed by people with mental illness over a 12 month period.

- According to the NHS, people with mental illness aged between 15-25 took an average of 11.4 more days away from work per year compared to their counterparts without mental illness.

The same number of days is estimated to be lost, for those who do not work, from their household productivity, which is valued at 30% of the average wage rate.

[9] Comparison is between youth with a diagnosed mental illness with symptoms in the last 12 months and those with neither. Age range is 17-25, as most 16 year olds are still at school.

Based on these parameters and the AWE for each age-gender group, Access Economics estimates that in 2009, **the total cost of absenteeism and lost home production due to mental illness is $1.0 billion for people aged 15-25**. This includes around $0.8 billion due to absenteeism for people in paid work and around $0.2 billion in lost household productivity for those in unpaid work.

4.1.3 PRESENTEEISM

Mental illness can also affect a person's ability to function effectively while at work, for the same reasons as it contributes to absenteeism and lower employment participation. Presenteeism can be estimated by multiplying the number of days worked with mental illness by the percentage reduction in effectiveness on days worked with mental illness.

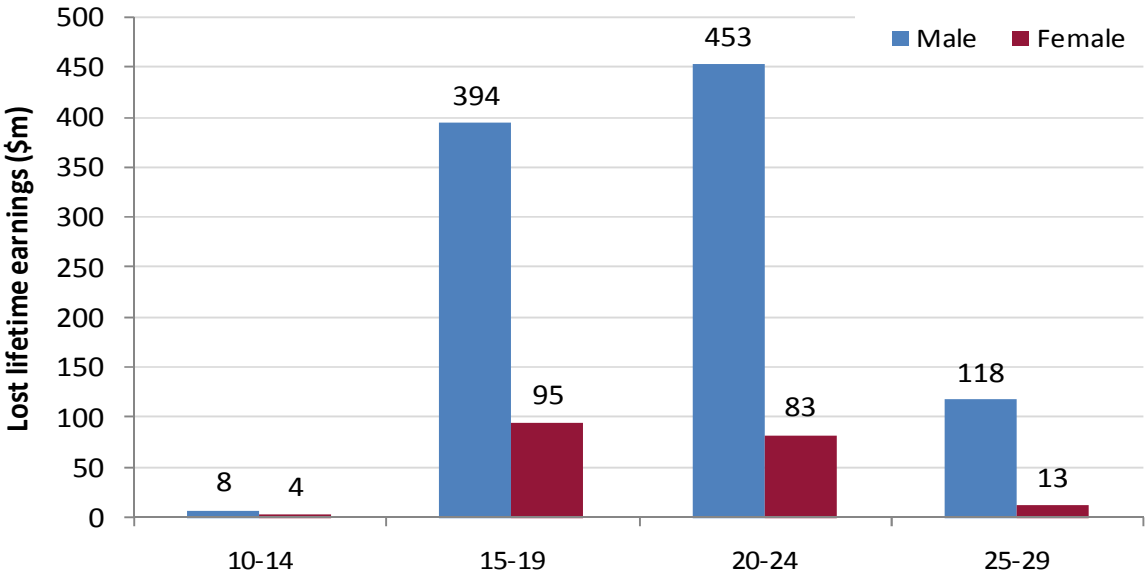
Data for presenteeism were not available from the NHS. However, a meta-analysis by Goetzel et al (2004) of presenteeism studies in the United States found that workers with mental illness (defined in the paper as depression/sadness/mental illness) averaged 15.3% lower productivity than their counterparts. Using this reduction in productivity while at work and the AWE for each age-gender group, the lost work effectiveness was calculated.

Access Economics estimates that in 2009, **the total cost of 'presenteeism' (lower productivity while at work) due to mental illness is $2.2 billion for people aged 15-25**.

4.1.4 PREMATURE DEATH

From the calculations in Section 2.1, there are an estimated 772 deaths due to mental illness in 2009 (566 males and 206 females). Based on the age-gender distribution of these deaths, and incorporating employment rates and estimates of average lifetime earnings for different age-gender groups, the present value of lost earnings due to mortality among those who would otherwise have been employed was estimated as shown in Figure 4-1.

FIGURE 4-1: MENTAL ILLNESS, COSTS OF PREMATURE MORTALITY BY AGE AND GENDER ($ MILLION)



Source: Access Economics.

The estimated annual cost due to lost productivity from premature death due to mental illness is $1.2 billion in 2009 for people aged 15-25.

Premature death also leads to additional search and hiring costs for replacement workers. These are estimated as the number of people with mental illness (by age and gender) who die prematurely, multiplied by the chance of being employed (if they did not die), multiplied by the search and hiring cost brought forward three years. The search and hiring cost is estimated as 26 weeks at AWE and the three year bring forward reflects average staff turnover rates in Australia.

In 2009, additional search and hiring costs are estimated at $0.36 million for people with mental illness aged 15-25, based on the present value of bringing forward three years of average cost of staff turnover (26 weeks at AWE).

4.1.5 LOST TAXATION REVENUE

Reduced earnings due to reduced workforce participation, absenteeism and premature death also have an effect on taxation revenue collected by the Government. As well as forgone income (personal) taxation, there will also be a fall in indirect (consumption) tax, as those with lower incomes spend less on the consumption of goods and services.

Personal income tax forgone is a product of the average personal income tax rate (18.5%) and the forgone income. With mental illness and lower income, there will be less consumption of goods and services, with the indirect taxation rate estimated as 12.0%. These average taxation rates are derived for 2009 from the Access Economics macroeconomic model.

Around $2.3 billion in potential tax revenue is estimated to be lost in 2009, due to the reduced productivity of people with mental illness aged 15-25.

Lost taxation revenue is considered a transfer payment, rather than an economic cost per se. However, raising additional taxation revenues does impose real efficiency costs on the Australian economy, known as **deadweight losses (DWLs)**. Administration of the taxation system costs around 1.25% of revenue raised (derived from total amounts spent and revenue raised in 2000-01, relative to Australian Government department running costs). Even larger DWLs arise from the distortionary impact of taxes on workers' work and consumption choices. These distortionary impacts are estimated to be 27.5% of each tax dollar collected (Lattimore, 1997 and used in Productivity Commission, 2003:6.15-6.16, with rationale). Altogether the DWL is 28.75% of the value of the taxation forgone.

Access Economics estimates that around **$666 million in deadweight loss is incurred in 2009**, from the additional taxation required to replace that forgone due to lost productivity of people with mental illness (Table 4-1).

TABLE 4-1: LOST EARNINGS AND TAXATION DUE TO MENTAL ILLNESS, 2009

Potential earnings lost ($million)	**7,329**
Average personal income tax rate*	18.5%
Potential personal income tax lost	1,356
Average indirect tax rate*	13.1%
Average indirect tax lost	962
Total potential tax revenue lost	2,318
Deadweight loss from additional taxation	**666**

*Source: Access Economics macroeconomic model (2009).

Welfare payments made to people who are no longer working must, in a budget-neutral setting, also be funded by additional taxation. The DWLs associated with welfare transfers are calculated in Section 4.4, where the nature of DWLs is explained in more detail.

4.2 CARER COSTS

Carers are people who provide informal care to others in need of assistance or support. Most informal carers are family or friends of the person receiving care. Carers may take time off work to accompany people with mental illness to medical appointments, stay with them in hospital, or care for them at home. Carers may also take time off work to undertake many of the unpaid tasks that the person with mental illness would do if they did not have mental illness and were able to do these tasks.

Informal care is distinguished from services provided by people employed in the health and community sectors (formal care) because the care is generally provided free of charge to the recipient and is not regulated by the government.

While informal care is provided free of charge, it is not free in an economic sense, as time spent caring is time that cannot be directed to other activities such as paid work, unpaid work (such as housework or yard work) or leisure. As such, informal care is a use of economic resources. Carers may also experience health and quality of life impacts from caring, although in this study the measurement of carer costs are limited to their productivity losses.

4.2.1 METHODOLOGY

There are three potential methodologies that can be used to place a dollar value on the informal care provided.

- **Opportunity cost** is the value of lost wages forgone by the carer.
- **Replacement valuation** is the cost of buying a similar amount of services from the formal care sector.
- **Self-valuation** is what carers themselves feel they should be paid.

Access Economics has adopted the opportunity cost method in this report as it provides the most accurate estimate of carer costs and sufficient demographic data on providers of care for people with mental illness are available.

4.2.2 INFORMAL AND COMMUNITY CARE COSTS

Informal care costs are the value of the care provided by informal friends or family carers. This report analyses the available epidemiological data (from Australia and overseas) together with ABS *Survey of Disability, Ageing and Carers* (SDAC) data (ABS, 2003), to gain

estimates of the total number of hours of care provided to people with mental illness in 2009, and the average unit cost of that care.

SDAC data for the year 2003 as reported by Vecchio (2008) identified around 52,532 carers who cared for people with mental illness as their main condition.

However, it is important to avoid double counting the people with mental illness who would have received care anyway. As such it is necessary to identify the 'excess' amount of care provided to people with mental illness by calculating the usage rates of informal care relative to people without a mental illness.

The AIHW (Begg et al, 2007) reported that in 2003, there were 3.82 million people with mental illness. Having both carer numbers and mental illness prevalence data for 2003 shows that 1.4% of people with mental illness have a carer, where mental illness is the main condition. In comparison, the 2003 SDAC data ABS (2003) show that 2.4% of the general population have a carer. In the absence of more granular age-based data from these sources, it is necessary to estimate differences based on age using alternative sources.

It was considered reasonable to assume that fewer young people would require carers compared to older people. The prevalence of disability in people aged 15-24 is only 9.0%, which is less than half (45%) the average for all people (20%) (ABS, 2003). If the ratio of carers to disability is similar across age cohorts, then by implication, only 45% as many young people would need carers as would the general population. That is, 1.1% (45%*2.4%) of young people without mental illness would require carers – which is lower than the number of people with mental illness who have carers (1.4%). As a result, young people with mental health illness were estimate to be 30% more likely to need carers (1.4%-1.1%/1.1%).

Based on these findings and incorporating age-gender AWE in Australia, Access Economics estimates that in 2009 the total **additional cost of care for people aged 12-25 with mental illness is around $62.1 million. This equates to $62 per person with mental illness in 2009.**

4.3 FUNERAL COSTS

The 'additional' cost of funerals borne by family and friends of people with mental illness is based on the additional likelihood of premature death associated with mental illness (Section 2.1) in the year 2009. However, some patients (particularly older patients) would have died in 2009 anyway. Eventually everyone must die and thus incur funeral expenses. However, in the absence of mental illness, these young people could have been expected to live for 50 or more years. Discounting the cost of a funeral in half a century's time at any reasonable discount rate yields a net present value (NPV) approaching zero dollars. The Bureau of Transport and Road Economics (2000) calculated a weighted average cost of a funeral across all states and territories, to estimate an Australian total average cost of $3,200 per person for 1996, or **$4,439 per person who died in 2009**.

The **bring forward of funeral costs** associated with premature death for people with mental illness aged 15-25 is estimated at around **$3.4 million in 2009.**

4.4 DEADWEIGHT LOSSES FROM TRANSFERS

4.4.1 WELFARE AND INCOME SUPPORT PAYMENTS

Transfer payments represent a shift of resources from one economic entity to another. The act of taxation and redistribution creates distortions and inefficiencies in the economy, so transfers also involve real net costs to the economy.

Unit data from the ABS (2008) shows that there were 204,200 young people (aged 16-25) with mental illness receiving government pensions.

Centrelink data (special data request) shows that the (weighted) average payment for Disability Support Pension, Newstart Allowance and Sickness allowance is $522 per fortnight (Table 4-2).

Applying this payment to young people with mental illness receiving pensions yields an estimated total welfare payment of $2.8 billion for these people in 2009. However, as some of these people would have been on welfare even if they did not have mental illness, this figure needs to be reduced by a (weighted) average reliance of 12.4% (Tseng and Wilkins, 2002). **Thus, the 'excess' reliance on welfare for young people with mental illness is $2.4 billion dollars in 2009**.

TABLE 4-2: WELFARE PAYMENTS

	People	Payment for singles no children ($ per fortnight)	Total payments ($million)
Disability support pension	742,734	569.8	11,003
Newstart allowance	509,742	453.3	6,008
Sickness allowance	6,775	453.3	80
Total	1,259,251	522.0	17,091

Source: Centrelink special data request and Access Economics calculations.

4.4.2 DEADWEIGHT LOSSES

The welfare payments calculated immediately above are, like taxation revenue losses, not themselves economic costs but rather a financial transfer from taxpayers to the income support recipients. The real resource cost of these transfer payments is only the associated DWL.

DWLs refer to the costs of administering welfare pensions and raising additional taxation revenues. Although invalid and sickness benefits and forgone taxation are transfers, not real costs (so should not be included in the estimation of total costs), it is still worthwhile estimating them as that helps us understand how the total costs of mental illness are shared between the taxpayer, the individual and other financiers.

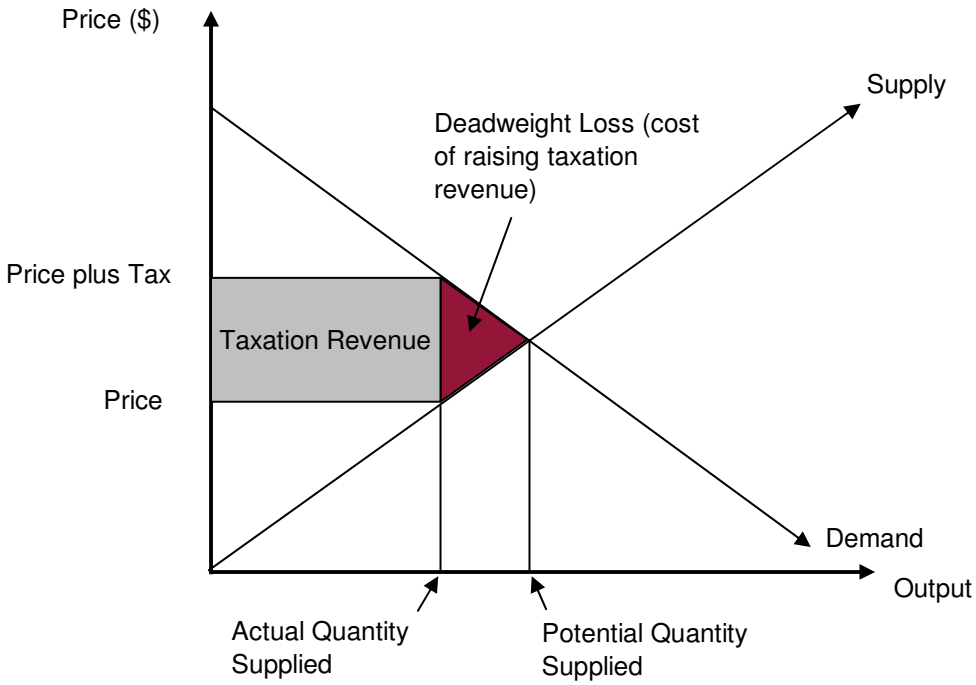
There are two sources of lost tax revenue that result from the lower earnings – the potential income tax forgone and the potential indirect (consumption) tax forgone. The latter is lost because, as income falls, so does consumption of goods and services. The average personal income tax rate used is 18.5% and the average indirect taxation rate used is 13.1%, based on parameters for 2009 from the Access Economics macroeconomic model.

Transfer payments (Government payments/services and taxes) are not a net cost to society as they represent a shift of consumption power from one group of individuals to another. If

the act of taxation did not create distortions and inefficiencies in the economy, then transfers could be made without a net cost to society. However, through these distortions, taxation does impose a DWL on the economy.

DWL is the loss of consumer and producer surplus, as a result of the imposition of a distortion to the equilibrium (society preferred) level of output and prices. Taxes alter the price and quantity of goods sold compared to what they would be if the market were not distorted, and thus lead to some diminution in the value of trade between buyers and sellers that would otherwise be enjoyed (Figure 4-2).

FIGURE 4-2: DWL OF TAXATION



The rate of DWL used in this report is 27.5 cents per $1 of tax revenue raised plus 1.25 cents per $1 of tax revenue raised for Australian Taxation Office administration, based on Productivity Commission (2003) in turn derived from Lattimore (1997), i.e. 28.75% overall. The total extra tax dollars required to be collected include:

- the taxation revenue lost as a result of mental illness and its impacts – $666.4 million;
- the value of government services provided (including the Government-funded component of health system costs, with $373 million of DWL); and
- the additional induced social welfare payments required to be paid (with $698.3 million of DWL).

Thus the DWL for people aged 15-25 with mental illness in 2009 is estimated at around $1.64 billion.

4.5 SUMMARY OF OTHER FINANCIAL COSTS

In total, **the non-health related financial costs of mental illness for people aged 15-25 are estimated to be $9.2 billion in 2009**.

TABLE 4-3: SUMMARY OF OTHER FINANCIAL COSTS OF MENTAL ILLNESS, 2009

	$ million
Productivity costs	**7,459**
Employment impacts	3,115
Absenteeism	1,019
Presenteeism	2,156
Premature death	1,168
Search and hiring costs	0.4
Carer costs	**62**
Aids and modifications	**-**
Funeral costs	**3**
DWL	**1,642**
Total other financial costs	**9,167**

5. BURDEN OF DISEASE

This chapter estimates the burden of disease of mental illness in Australia, measured in terms of disability adjusted life years (DALYs), disaggregated by years of life lost due to premature death (YLL) and healthy years of life lost due to disability (YLD), and converted into a reasonable monetary equivalent.

- The disability, loss of wellbeing and premature death that result from mental illness are more difficult to measure, but have been analysed in this chapter in terms of the years of healthy life lost, both quantitatively and qualitatively, known as the 'burden of disease', with an imputed value of a statistical life year (VSLY) so as to compare these costs with the financial costs of mental illness.

5.1 METHODOLOGY – VALUING LIFE AND HEALTH

5.2 MEASURING BURDEN: DALYS, YLLS AND YLDS

In the last decade, a non-financial approach to valuing human life has been derived, where loss of wellbeing and premature mortality – called the 'burden of disease and injury' – is measured in terms of Disability Adjusted Life Years, or DALYs. This approach was developed by the World Health Organization (WHO), the World Bank and Harvard University for a study that provided a comprehensive assessment of mortality and disability from diseases, injuries and risk factors in 1990, projected to 2020 (Murray and Lopez, 1996). Methods and data sources are detailed further in Murray et al (2001) and the WHO continues to revisit the estimates for later years.

A DALY of 0 represents a year of perfect health, while a DALY of 1 represents death. Other health states are attributed values between 0 and 1 as assessed by experts on the basis of literature and other evidence of the quality of life in relative health states. For example, the *disability weight* of 0.18 for a broken wrist can be interpreted as losing 18% of a person's quality of life relative to perfect health, because of the inflicted injury. Total DALYs lost from a condition are the sum of the mortality and morbidity components – the Year(s) of Life Lost due to premature death (YLLs) and the Year(s) of healthy life Lost due to Disability (YLDs).

The DALY approach has been successful in avoiding the subjectivity of individual valuation and is capable of overcoming the problem of comparability between individuals and between nations, although some nations have subsequently adopted variations in weighting systems, for example age-weighting for older people. This report treats the value of a life year as equal throughout the lifespan.

As these approaches are not financial, they are not directly comparable with most other cost and benefit measures. In public policy making, it is often desirable to apply a monetary conversion to ascertain the cost of an injury, disease or fatality or the value of a preventive health intervention, for example, in cost benefit analysis (CBA). Such financial conversions tend to utilise 'willingness to pay' or risk-based labour market studies as described in the next section.

5.2.1 WILLINGNESS TO PAY AND THE VALUE OF A STATISTICAL LIFE YEAR

The burden of disease as measured in DALYs can be converted into a dollar figure using an estimate of the **Value of a 'Statistical' Life** (VSL). As the name suggests, the VSL is an estimate of the value society places on an anonymous life. Since Schelling's (1968) discussion of the economics of life saving, the economic literature has focused on

willingness to pay (WTP) – or, conversely, willingness to accept (WTA) – measures of mortality and morbidity, in order to develop estimates of the VSL.

Estimates may be derived from observing people's choices in situations where they rank or trade off various states of wellbeing (loss or gain) either against each other or for dollar amounts eg, stated choice models of people's WTP for interventions that enhance health or WTA poorer health outcomes or the risk of such states. Alternatively, risk studies use evidence of market trade-offs between risk and money, including numerous labour market and other studies (such as installing smoke detectors, wearing seatbelts or bike helmets and so on).

The extensive literature in this field mostly uses econometric analysis to value mortality risk and the 'hedonic wage' by estimating compensating differentials for on-the-job risk exposure in labour markets; in other words, determining what dollar amount would be accepted by an individual to induce him/her to increase the probability of death or morbidity by a particular percentage. Viscusi and Aldy (2002), in a summary of mortality studies, found the VSL ranged between US$4 million and US$9 million with a median of US$7 million (in year 2000 US dollars), similar but marginally higher than the VSL derived from studies of US product and housing markets. They also reviewed a parallel literature on the implicit value of the risk of non-fatal injuries.

Weaknesses in the WTP approach, as with human capital approaches to valuing life and wellbeing, are that there can be substantial variation between individuals. Extraneous influences in labour markets such as imperfect information, income/wealth or power asymmetries can cause difficulty in correctly perceiving the risk or in negotiating an acceptably higher wage in wage-risk trade off studies, for example.

As DALYs are enumerated in years of life rather than in whole lives it is necessary to calculate the **Value of a 'Statistical' Life Year (VSLY)** based on the VSL. This is done using the formula:[10]

$$VSLY = VSL / \Sigma_{i=0,\ldots,n-1}(1+r)^i$$

Where: n = years of remaining life, and
r = discount rate

Clearly there is a need to know *n* (the years of remaining life), and to determine an appropriate value for *r* (the discount rate). There is a substantial body of literature, which often provides conflicting advice, on the appropriate mechanism by which costs should be discounted over time, properly taking into account risks, inflation, positive time preference and expected productivity gains.

The Office of Best Practice Regulation (OBPR) has provided an estimate of the VSLY, which appears to represent a fixed estimate of the net VSLY. The OBPR (2008) states that the VSLY is $151,000[11] in 2007 dollars. The OBPR further advises that this figure would be inflated to $161,750 in 2009 dollars – which assumes that the annual consumer price index was 4% for 2008 and 3% for 2009 ($151,000 * 1.04 * 1.03). This value for VSLY is used in this report.

[10] The formula is derived from the definition:
VSL = ΣVSLYi/(1+r)^i where i=0,1,2….n
where VSLY is assumed to be constant (ie, no variation with age).

[11] http://www.finance.gov.au/obpr/cost-benefit-analysis.html

5.3 BURDEN OF DISEASE DUE TO MENTAL ILLNESS

5.3.1 DISABILITY WEIGHTS

One of the main costs of mental illness is the loss of wellbeing and quality of life that it entails. This can be estimated by ascribing a disability weight to mental illness.

Disability weights were estimated for five mental illness categories using the total years lived with disability (YLD) (Begg et al, 2007) and divided by the 2009 number of cases of the illness (estimated by Access Economics by multiplying the prevalence of each of the six types of mental illnesses by the 2009 population). The estimates were then multiplied by the percentage prevalence of each type of mental illness (i.e. if substance abuse accounts for 40% of mental illness then we multiplied by 0.4). This gave a weighted average of disability weights for each of the five mental illness categories, as shown below. Most of the mental illnesses have a similar disability weight for males and females. Schizophrenia has the highest disability weight of the mental illnesses, although it has a much lower prevalence than the others. This method implicitly adjusts for comorbidities.

- **The weighted disability weight for males with a mental illness is 0.092 and for females it is 0.117.**

This can be interpreted as 9.2% loss of quality of life for male youth and 11.7% for female youth, due to mental illness.

TABLE 5-1: DISABILITY WEIGHTS OF MENTAL ILLNESS BY CATEGORY

	Males	Females
Substance abuse	0.034	0.038
Anxiety and depression	0.128	0.126
Schizophrenia	0.434	0.434
Bipolar	0.111	0.116
Other	0.128	0.118
Total	0.092	0.117

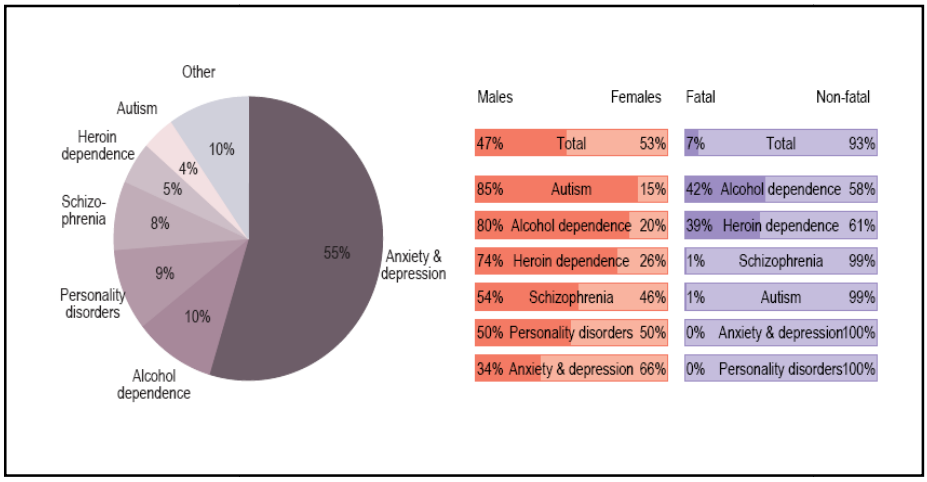
Note: Other is the weighted average of eating, childhood and personality disorders.

The burden of disease was estimated using AIHW data. Begg et al (2007) reports that anxiety and depression[12] was the leading cause of overall female burden, and the third leading cause of overall male burden in 2003. Anxiety and depression also carries with it an increased risk of ischaemic heart disease and suicide. When this risk was accounted for, the burden attributable to anxiety and depression increased from 7.3% to 8.2% of the total burden of disease and injury in Australia.

For both males and females, anxiety and depression is the leading cause of morbidity (YLD) burden (55% of the total morbidity burden together) – although its cost is almost twice as great in females (66% of all DALYs from anxiety and depression) as in males (34%). This is shown in the figure below.

[12] Unlike the ABS, the AIHW treats anxiety and depression as a single spectrum disorder, arguing that the causes and treatments are very similar, and there is a high degree of comorbidity.

FIGURE 5-1: MENTAL ILLNESS MORBIDITY AND MORTALITY, AUSTRALIA, 2007



Source AIHW (Begg et al, 2007).

5.3.2 YEARS OF LIFE LOST DUE TO DISABILITY

Based on the disability weights outlined above and the total number of young people experiencing mental illness, the YLD for mental illness has been calculated for the target age group by gender, for the year 2009.

> In total, YLD for mental illness for people aged 15-25 was an estimated 105,397 DALYs in 2009.

TABLE 5-2: ESTIMATED YEARS OF HEALTHY LIFE LOST DUE TO DISABILITY (YLD), 2009 (DALYS)

	Estimated disability weight	Prevalence	YLD
Males	0.092	477,701	44,118
Females	0.117	525,604	61,279

5.3.3 YEARS OF LIFE DUE TO PREMATURE DEATH

Based on the relative risk of mortality due to mental illness outlined above in Section 2.1, **there are an estimated 772 deaths due to mental illness in people aged 15-25 in 2009**. YLLs have been estimated from the age-gender distribution of deaths by the corresponding YLLs for the age of death in the Standard Life Expectancy Table (West Level 26) with a discount rate of 3.0% and no age weighting.

> In total, YLL for mental illness for people aged 15-25 was an estimated 21,578 DALYs in 2009 (Table 5-3).

TABLE 5-3: YEARS OF LIFE LOST DUE TO PREMATURE DEATH (YLL) DUE TO MENTAL ILLNESS, 2009

	12-14	15-19	20-24	25	Total
Males	154	6,089	7,081	1,803	15,728
Females	132	2,943	2,400	375	5,850
Persons	286	9,033	9,481	2,179	21,578

5.3.4 TOTAL DALYS DUE TO MENTAL ILLNESS

The overall loss of wellbeing due to mental illness for young people is estimated as 126,975 DALYs.

Multiplying the number of DALYs by the net VSLY 161,750 provides an estimate of the net dollar value of the loss of wellbeing due to mental illness.

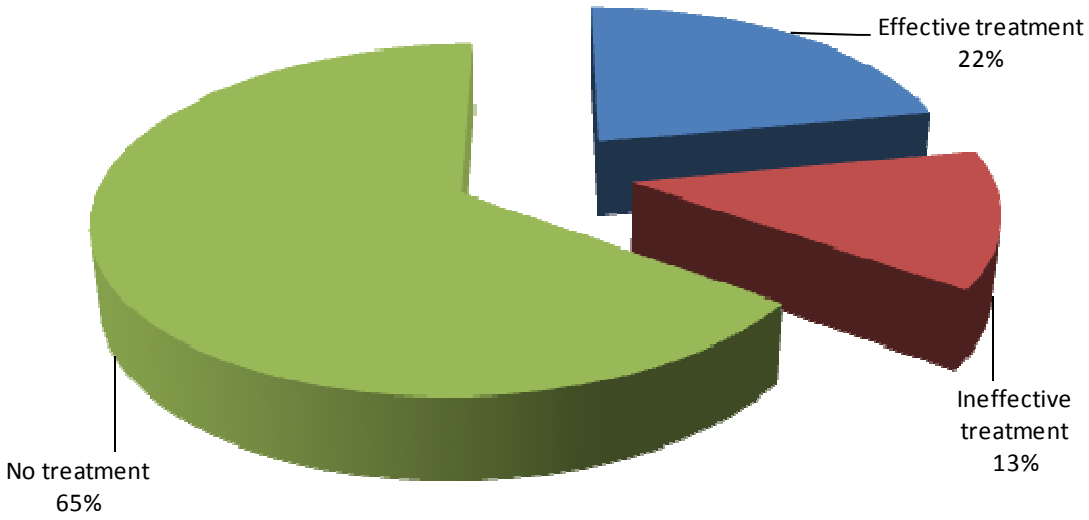
The estimated net cost of lost wellbeing from mental illness in young people is $20.5 billion in 2009. This reflects the prevalence of mental illness in the community and its relatively high disability weights.

6. INTERVENTIONS FOR MENTAL ILLNESS

Most people with mental illness do not receive any treatment for their condition. Even when treatment is received it is often not effective.

ABS data published as part of the *Mental Health and Wellbeing Survey* (ABS, 2009) show that 65% of people with mental illness receive no treatment at all. Overall, only 22% receive effective treatment – self-reported by ABS survey participants as their needs being met (Figure 6-1).

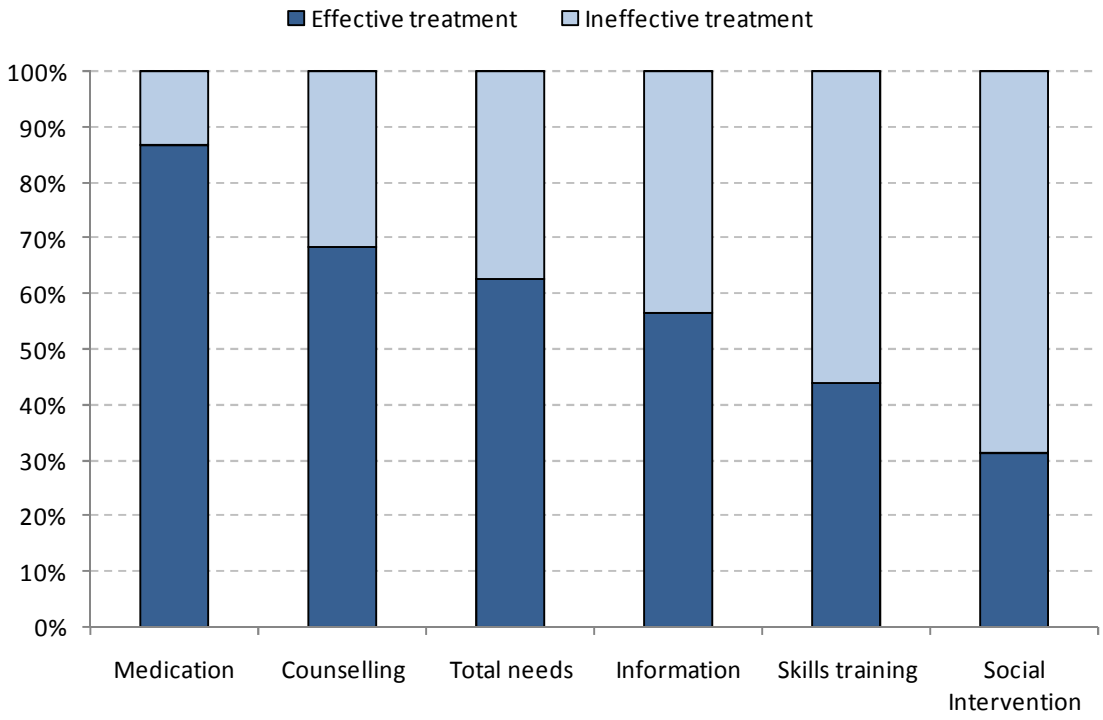
FIGURE 6-1: TREATMENT FOR MENTAL ILLNESS (ALL AGES)



Source: ABS (2009).

Examining the effectiveness of treatment by type of intervention, the data show that only people receiving medication or counselling reported that their needs were being largely met. Conversely those needing treatments that are not usually provided by medical professionals generally did not receive the help they needed (Figure 6-2).

FIGURE 6-2: EFFECTIVENESS OF TREATMENT BY TYPE (ALL AGES)



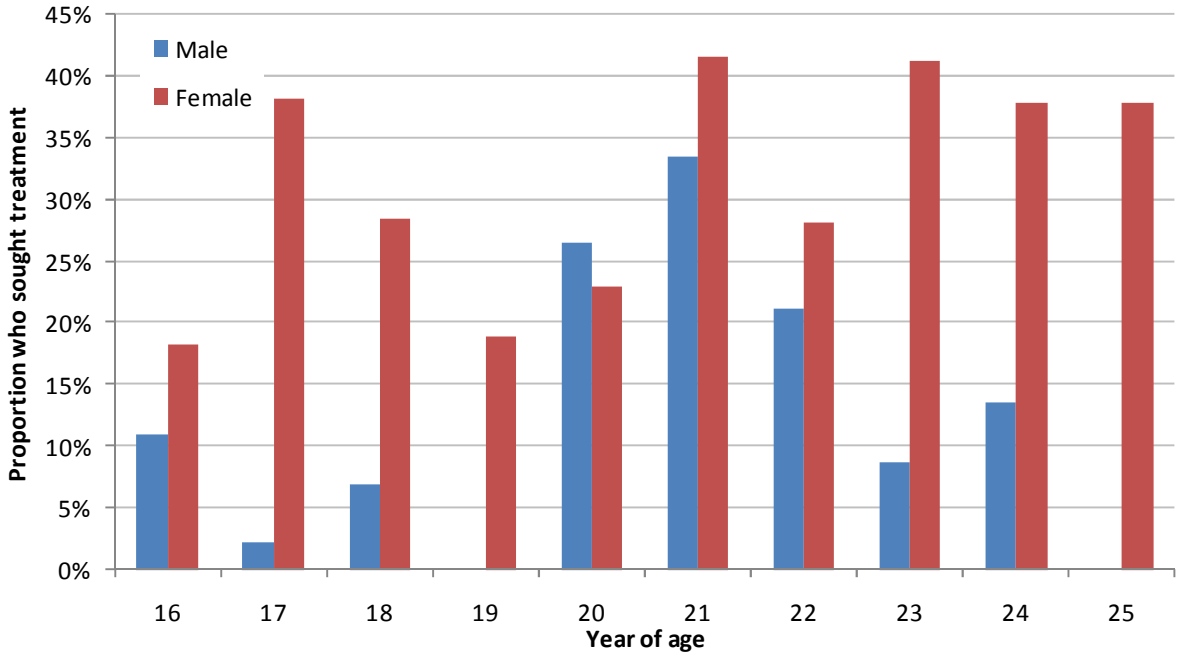
Source: ABS (2009). Effectiveness defined as needs being met.

The ABS data also show that young people aged 16-24 who had mental illness received even less treatment than did older people with mental illness.

- **35% of the total population with mental illness received some treatment. However, only around 25% of people aged 16-24 with mental illness received any treatment.[13]**
- **Only 15% of males aged 16-24 received any treatment for their mental illness, which is concerning given the relatively high number of suicides in this age group.**

[13] Data on mental health services provided to males aged 19 and 25 have been excluded from the survey results by the ABS. Access Economics has accounted for this in determining the total proportion of treatment services by age.

FIGURE 6-3: PROPORTION OF PEOPLE AGED 16-25 WHO RECEIVED TREATMENT FOR MENTAL ILLNESS



Source: ABS (2009). Data on mental health services provided to males aged 19 and 25 have been excluded from the survey results by the ABS, due to lack of data reliability.

A number of Australian studies have focused on assessing the efficacy and cost effectiveness of evidence-based interventions for mental illness, compared to current care interventions. There are two main types: studies that focus on the effects of specific evidence-based interventions (Vos et al, 2005a and 2005b, Haby et al, 2004, Vos et al., 2004) and studies that focus on hypothetical optimal treatment packages (Issakidis et al, 2004, Sanderson et al, 2003).

However, studies specifically focusing on economic evaluation of mental illness interventions for Australian youth are quite rare.

6.1 AUSTRALIAN YOUTH MENTAL ILLNESS STUDIES

6.1.1 ASSESSING COST EFFECTIVENESS IN MENTAL HEALTH

Two particular studies, part of the Assessing Cost Effectiveness' Mental Health (ACE-MH) Project, attempted to identify the cost effectiveness of specific interventions for major depressive disorder (MDD), with one focusing on children and adolescents (Haby et al, 2004), and the other on adults (Vos et al, 2005a).

In these studies, different provider scenarios (public, private) were modelled and costs were broken up by costs to government and costs to patients. In addition, these analyses are useful for evaluating interventions as they also included consideration of 'second filter' criteria, which allowed assessment of the real-world applicability of interventions, rather than just basing conclusions on results from clinical trials. Another important aspect of these studies is that cost effectiveness can be examined in terms of the different interventions (pharmacological and psychological), rather than as a hypothetical optimal treatment mix. Unlike the studies previously discussed, benefits were described in terms of both DALYs and YLDs.

6.1.1.1 DEPRESSION IN CHILDREN AND YOUTH

The study population in Haby et al (2004) was children and adolescents eligible for intervention aged 6-17 years in the Australian population in 2000, who were seeking care for MDD at the time of the study but who would have received types of care other than evidence based medicine under current practice at the time. All incident cases of MDD in the population in the year 2000 were included. For selective serotonin re-uptake inhibitors (SSRIs) as a second line treatment, the eligible group was those children who do not remit by the end of the treatment with cognitive behaviour therapy (CBT) or do not adhere to the treatment with CBT. It was assumed that 50-90% were offered treatment with SSRIs. Overall, the study found that CBT delivered by a public psychologist would be the most cost effective treatment for child and adolescent depression, and the second most affordable option for the government. CBT by private psychologists was found to be the most affordable option for the government. However, it was considered likely to be unaffordable for patients, which would have a significant impact on uptake and adherence.

Haby et al (2004) applied a cost effectiveness threshold of $50,000/DALY, and accordingly SSRIs were found to be cost effective as a first and second line treatment for youth depression; however, they were found to be less effective than CBT, resulting in lower total health benefits. The health benefits and cost effectiveness findings for SSRI treatments and CBT treatments are summarised in the tables below. CBT is shown under various provider arrangements, while SSRIs are shown in terms of both first-line and second-line treatments.

- The World Health Organization uses gross domestic product (GDP) as a readily available indicator to derive the following three categories of cost-effectiveness: Highly cost-effective interventions cost less than one times GDP per capita, per DALY averted; Cost-effective interventions cost between one and three times GDP per capita, per DALY averted; and not cost-effective interventions cost more than three times GDP per capita (WHO 2009).

TABLE 6-1: COST EFFECTIVENESS ANALYSIS OF COGNITIVE BEHAVIOURAL THERAPY FOR DEPRESSION IN CHILDREN AND ADOLESCENTS

	Private psychologist	Public psychologist	Private psychiatrist	Public psychiatrist
Health benefit				
YLL	0	0	0	0
YLD	360 (120–920)	360 (120–920)	360 (120–920)	360 (120–920)
DALYs	360 (120–920)	360 (120–920)	360 (120–920)	360 (120–920)
Intervention costs (A$ millions):				
Government	0.9 (0.5–1.6)	5.7 (3.2–9.2)	13 (7.2–20)	14 (7.5–23)
Patient	12 (6.3–20)	0.15 (0.1–0.3)	1.8 (1.0–2.9)	0.15 (0.1–0.3)
Total	13 (6.9–21)	5.8 (3.3–9.4)	15 (8.3–23)	14 (7.6–24)
Incremental costs† (A$ millions):				
Government	−1.0 (− 2.0– −0.4)	3.7 (1.9–6.7)	11 (6.0–18)	12 (6.2–21)
Patient	11 (6.0–19)	−0.3 (−0.5– −0.1)	1.4 (0.8–2.3)	−0.3 (−0.5– −0.1)
Total	10 (5.5–17)	3.4 (1.7–6.3)	12 (6.7–20)	12 (6.1–20)
Cost-effectiveness ratio (A$ thousand per DALY)	28 (13–70)	9 (3.9–24)	34 (16–82)	32 (14–79)
Proportion of iterations that fall below A$50 000 per DALY saved‡	88%	100%	80%	81%

YLL, years of life lost; YLD, years lived with disability; DALYs, disability-adjusted life years (YLL + YLD); †This is the cost of the intervention reduced by the cost of non-EBM not given; ‡Calculated from the 4000 iterations generated in the uncertainty analysis for the cost-effectiveness ratio; values are medians; figures in brackets show the 95% uncertainty interval; negative values are savings from the reduction in non-EBM treatments. Cost savings can result from a reduction in total cost of health services and/or from a shifting of costs between providers, i.e. government *versus* patient.

Source: Haby et al (2004).

TABLE 6-2: COST EFFECTIVENESS ANALYSIS - SSRIS FOR DEPRESSION IN CHILDREN AND ADOLESCENTS

	SSRIs as first-line treatment compared to current practice	SSRIs as second-line treatment compared to no further treatment
Health benefit:		
YLL	0	0
YLD	230 (88–510)	130 (47–320)
DALYs	230 (88–510)	130 (47–320)
Intervention costs (A$ millions):		
Government	6.5 (3.8–10)	2.6 (1.3–4.6)
Patient	1.3 (0.8–2.0)	0.5 (0.3–0.9)
Total	7.8 (4.6–12)	3.1 (1.6–5.5)
Incremental costs† (A$ millions):		
Government	4.6 (2.6–7.2)	As above
Patient	0.9 (0.5–1.4)	
Total	5.4 (3.1–8.6)	
Cost-effectiveness ratio (A$ thousand per DALY)	23 (13–53)	23 (13–54)
Proportion of iterations that fall below A$50 000 per DALY saved‡	96%	96%

YLL, years of life lost; YLD, years lived with disability; DALYs, disability-adjusted life years (YLL + YLD); values are medians; figures in brackets show the 95% uncertainty interval; †this is the cost of the intervention reduced by the cost of non-EBM not given; ‡calculated from the 4000 iterations generated in the uncertainty analysis for the cost-effectiveness ratio.

Source: Haby et al (2004).

Another important conclusion of the study was that both CBTs and SSRIs were found to have lower effect sizes in children and adolescents than in adults (and thus be less cost effective). Some of the second filter considerations for treatment with CBT in children included:

- moderate equity concerns, in terms of access to rural/remote areas, appropriateness for minority groups and inequity in user pays systems;
- feasibility of implementation, in terms of having an adequate workforce of providers and ability of health funding in enabling adequate access via primary care; and
- acceptability, in terms of the costs to consumers through private providers and acceptance of treatment by clinicians/consumers.

For treatment via SSRIs, the following second-filter issues were highlighted:

- there was sufficient evidence of adequate quality;
- there were no important equity concerns;
- they appeared to be feasible within current working arrangements; and
- there were acceptability concerns in terms of parental concern over using drugs in children and adolescents, and ethical concerns about drugs as a first-line treatment due to side effects.

However, in Australia, no antidepressants (including any SSRIs) are currently approved by the Therapeutic Goods Administration (TGA) for the treatment of major depression in children and adolescents aged less than 18 years.[14]

6.1.1.2 ADHD

Vos et al (2005b) provided a summary of findings from the ACE-MH project including, attention deficit hyperactivity disorder (ADHD). Two drug interventions were analysed: dexamphetamine and methylphenidate. There was a large difference between the cost

[14] Australian Adverse Drug Reactions Advisory Committee. *Use of SSRI antidepressants in children and adolescents*. Updated statement 15 October 2004. http://www.tga.gov.au/adr/adrac_ssri.htm (accessed 18 December, 2008).

effectiveness ratios for these drugs, with dexamphetamine found to be more cost effective than methylphenidate. Second filter issues included the short duration of trials, access to treatment in remote areas, the unavailability of methylphenidate on the PBS, and over-prescription concerns.

6.2 WHO COLLABORATING CENTRE FOR EVIDENCE AND HEALTH POLICY IN MENTAL HEALTH

A team from the WHO Collaborating Centre for Evidence and Health Policy in Mental Health – Andrews et al (2004), Issakidis et al (2004) and Sanderson et al (2003) – conducted studies based on cost effectiveness under hypothetical optimal treatment packages.

Issakidis et al (2004) sought to examine the averted burden and economic efficiency of current versus optimal treatment in the area of anxiety disorders, and Sanderson et al (2003) examined these issues in the context of affective disorders. Together, affective and anxiety disorders cover the majority of mental illnesses.

Both studies utilised a similar methodological approach.

- Study populations were defined as the total number of people meeting the criteria for each disorder, in contact with health services at the time.
- A one year horizon was used both in terms of the analysis of costs and outcomes.
- Health outcomes were described in terms of YLD.
- Both studies sought to estimate the direct health sector costs of current treatment versus optimal treatment. Indirect costs of disorders and interventions, and the implementation costs of optimal treatment were not included in the analysis.
- A cost effectiveness analysis was utilised, with the measure of cost per YLDs averted.
- Health outcomes were not estimated directly by the studies and instead clinical trials and meta-analyses were utilised to get an idea of the effect size of various interventions. These were then translated via modelling into disability weight changes.
- Both studies defined efficacious or evidence-based interventions as pharmacotherapy and CBT, and two or more consultations with the same type of health professional.
- These studies developed hypothetical optimal treatment packages based on clinical guideline recommendations and expert reviews. Disorders were classified into 'severity' categories so as to further tailor optimal treatment packages to type and intensity of intervention.

Issakidis et al (2004) stated that their optimal treatment package for anxiety disorders was based on both pharmacotherapy and CBT. However, in line with clinical guideline recommendations, more emphasis was placed on CBT as a first-line treatment for the majority of people. For mild anxiety disorders, it was estimated that 10% could be managed effectively through GP-referred self-help programs and 60% through CBT delivered by a psychiatrist or psychologist. The remaining 30% were estimated to receive GP managed pharmacological therapy. For moderate to severe disorders, the majority (70%) were estimated to receive CBT.

The study indicated that optimal care would increase the overall efficacy of anxiety disorder treatments by increasing the overall number of people receiving effective treatments, particularly for social phobia. Treatment pattern changes across the various types of anxiety disorder were also estimated to have implications for efficacy. For panic disorder, increased efficacy was estimated due to a large shift from pharmacological treatment to psychological

treatment. Psychological treatment, according to the meta-analyses and clinical trials examined, was reported to be associated with a stronger effect on health outcomes than pharmacological treatment.

In general, the increased focus under optimal care on psychological treatments would result in higher psychological and psychiatrist costs and lower general health sector costs.

TABLE 6-3: COST EFFECTIVENESS ANALYSIS FOR CURRENT AND OPTIMAL TREATMENT FOR ANXIETY DISORDERS IN AUSTRALIA

		Efficacy		Cost per treated case	Total cost of treatment		Cost-effectiveness	
		YLDs averted		AUD	AUD (millions)		AUD per YLD averted	
	N	Estimate	95% CI	Estimate	Estimate	95% CI	Estimate	95% CI
Panic/agoraphobia								
Current treatment	68 754	2375	1762–3063	1188	81·7	54·1–101·1	34 389	20 998–49 854
Optimal treatment	68 754	3304	1988–5002	953	65·4	37·9–89·4	19 820	13 221–28 087
Social phobia								
Current treatment	43 071	2530	1988–3159	1011	43·6	28·0–61·4	17 218	10 136–26 038
Optimal treatment	43 071	3885	2260–3531	769	33·1	18·9–50·8	8531	5980–12 253
GAD								
Current treatment	141 333	14 469	11 891–17 297	795	112·3	83·8–140·0	7761	5531–10 488
Optimal treatment	141 333	23 424	18 142–29 091	837	118·2	94·2–141·0	5048	4105–6116
PTSD								
Current treatment	129 211	6687	4323–8973	1224	158·2	136·3–212·4	23 656	17 148–41 932
Optimal treatment	129 211	9489	6919–12 334	1155	149·2	140·7–194·1	15 728	12 550–24 311
Any anxiety disorder								
Current treatment	382 189	26 059	—	1035	395·7	—	15 184	—
Optimal treatment	382 189	40 102	—	957	366·1	—	9130	—

Source: Issakidis et al (2004).

Sanderson et al (2003), in developing an optimal treatment package for affective disorders, modelled SSRIs in the first instance of depression and dysthymia due to evidence of reported superior tolerability. The study elaborated on modelling of depression, in order to show the decision process behind optimal package determination for affective disorders. It was found that, based on the clinical evidence considered, primary care would be more suitable for management of mild to moderate depression, but more severe depression would require a greater weight towards specialist mental health services. For all cases of affective disorders, it was stated that their model of optimal evidence-based care was estimated to increase contact with GPs, with mental health specialist contact remaining similar to current care at the time.

For all affective disorders, according to the Sanderson et al study (2003), optimal care was associated with a larger improvement in health outcome on average than current care, due partly to the modelled increase in evidence based interventions. It was stated that the greater predicted health benefit of optimal care was also due to differences in the distribution of interventions, with psychological therapies more common under optimal care, whether with or without medication. Meta-analyses utilised by this study, like the anxiety study, indicated that psychological therapies tended to have larger effect sizes than medication.

TABLE 6-4: COST EFFECTIVENESS ANALYSIS FOR CURRENT AND OPTIMAL TREATMENT FOR AFFECTIVE DISORDERS IN AUSTRALIA

	Efficacy YLDs averted			Cost per treated case (AUD) Point estimate	Total cost of treatment (AUD) Point estimate (million)	95% CI Lower (million)	Upper (million)	Cost-effectiveness AUD per YLD averted Point estimate	95% CI Lower	Upper
	Point estimate	95% CI Lower	Upper							
Depression										
Current treatment	22 559	16 730	28 579	1 239	483.7	275.7	851.8	21 442	11 434	40 433
Optimal treatment	32 583	26 993	38 522	874	341.3	291.5	420.9	10 475	8283	14 049
Dysthymia										
Current treatment	4982	2806	9109	1 779	70.8	38.6	150.6	14 217	6157	36 536
Optimal treatment	7446	6565	8339	721	28.7	25.6	35.2	3858	3283	4983
Bipolar disorder										
Current treatment	2536	1779	3378	1 294	60.9	31.0	225.5	24 031	11 079	93 844
Optimal treatment	4529	3438	6489	2 301	108.4	82.1	164.1	23 934	14 785	38 298

Costs are in 1997–98 Australian dollars (AUD). YLD = years lived with disability; CI = confidence interval.

Source: Sanderson et al (2003).

6.3 ESTIMATING COSTS AND BENEFITS OF INTERVENTIONS

Affective and anxiety disorders, covered by Issakidis et al and Sanderson et al, account for over two-thirds of all cases of mental illness. Andrews et al (2004) added substance use disorders and schizophrenia, which collectively cover 85% of mental illnesses to establish a proxy cost effectiveness analysis (CEA) for all mental illness. The following analysis is largely based on Andrews et al (2004).

The team used a bottom-up approach to estimate the total costs of current treatment, using the number and types of treatment for each disease reported in the 1997 Mental Health Survey (ABS, 1998), and the then current costs for each treatment (Table 6-5).

Effectiveness of current treatment was sourced from epidemiological studies. This was then used to estimate the burden of disease[15] averted by current treatment. This total of burden averted was then added to the burden reported by the AIHW for these diseases to get an estimate of the underlying burden that would have existed in the absence of any intervention.

A similar exercise was conducted for optimal treatments - as recommended by experts in each field. Only 39.5% of people with mental illness were reported as having received any treatment. Andrews et al (2004) estimated the costs of applying optimal treatment to these patients, and the burden that would have been thus averted.

The costs and effects of both current and optimal treatment were then compared against the baseline scenario of no intervention.

The scenario was repeated for what the researchers considered was the greatest number of people who could be realistically reached – roughly around double the proportion (67%) of the population with mental illness who are currently reached. The authors did not spell out their rationale for this upper bound of what they considered practical. However, mental illness' current share of overall disease burden (13%, Begg et al, 2007) is roughly double its share of national health expenditure (7.8%, AIHW, 2008); so the approximate doubling of

[15] Andrews et al (2004) used YLDs rather than DALYs, as they considered that the burden of mental illness is mainly disability rather than lives lost.

coverage suggested by Andrews et al (2004) would be similar to what could be achieved if mental illness received a proportional share of health expenditure.

Andrews et al (2004) found that current treatment's effectiveness is even worse than its coverage, only averting 13% of the burden of mental illness. Partly this may be because, while many mental illnesses are chronic, current treatment often consists mainly of managing symptoms of the current episode. For example, Vos et al (2004) commented on current treatment:

> *Because the vast majority of people with depression experience multiple episodes over a lifetime and are particularly prone to relapses shortly after an index episode, there are convincing arguments for treating all depression as a chronic disorder and not just those with recurrent or more severe episodes as recommended in current treatment guidelines.*

Access Economics has repeated this exercise, updating the costs from Andrews et al (2004) to 2009,[16] and applying it only to young people aged 15-25 with mental illness (Table 6-6).

[16] Figures were updated using the AIHW's health inflation indices, as the article does not provide sufficient details to replicate their bottom-up costing exercises.

TABLE 6-5: COSTS AND EFFECTIVENESS OF MENTAL ILLNESS INTERVENTIONS, BY TYPE AND COVERAGE, 1997

	Prevalence (all ages)	YLD (before any treatment)	Any treatment (%)	YLD averted (%)	Cost per case (1997$)	Total cost $(m)	$/YLD averted
Current treatment	2,402,613	473123	39.5%	12.8%	1,920	1,822	30,041
Best practice treatment	2,402,613	473123	39.5%	19.7%	1,719	1,631	17,518
Best practice treatment realistic coverage	2,402,613	473123	67.0%	28.5%	1,324	2,131	15,814
Best practice treatment 100% coverage	2,402,613	473123	100.0%	39.9%	929	2,232	11,814

Source: Andrews et al (2004).

TABLE 6-6: COSTS AND EFFECTIVENESS OF YOUTH MENTAL ILLNESS INTERVENTIONS, BY TYPE AND COVERAGE, 2007

	Prevalence (youth)	YLD (before any treatment)	Any treatment (%)	YLD averted (%)	Cost per case (2009)	Total cost $(m)	$/YLD averted
Current treatment	1,003,356	118,909	39.5%	12.8%	2892	1,146	62,420
Best practice treatment	1,003,356	118,909	39.5%	19.7%	2590	1,026	36,399
Best practice treatment realistic coverage	1,003,356	118,909	67.0%	28.5%	1995	1,341	32,859
Best practice treatment 100% coverage	1,003,356	118,909	100.0%	39.9%	1400	1,404	24,548

Source: Access Economics estimates based on Andrews et al (2004), AIHW (2008) and Begg et al (2007).

Access Economics has then combined the above analysis of burden averted with the benefits gained from such treatment. Total costs reported in the preceding chapters of this report, are divided by total DALYs averted to get a measure of the dollar benefit to society of avoiding one DALY (245,069, including financial costs and burden of disease)[17]. This is then multiplied by the number of DALYs averted to derive a total benefit to society for each type of treatment (Table 6-7).

TABLE 6-7: COSTS AND BENEFITS OF CURRENT, BEST PRACTICE TREATMENT AND NO TREATMENT

Treatment	Coverage	DALYS averted	Cost of treatment ($m)	Benefit of treatment ($m)	BCR	Net benefit ($m)	$/DALY averted
Current	Current	15,244	1,146	3,736	3.26	2,590	62,420
Best practice	Current	23,406	1,026	5,736	5.59	4,710	36,399
Best practice	Realistic	33,873	1,341	8,301	6.19	6,960	32,859
Best practice	All	47,482	1,404	11,636	8.29	10,232	24,548

The findings indicate that current practice is worth undertaking, resulting in annual net benefits to society of $3.74 billion, and a benefit to cost ratio (BCR) of 3.26 to 1. Current treatment costs $62,420 per DALY averted, which is classified as cost effective by WHO measures[18].

However, moving to best practice treatment is considerably more effective. Applied to current patients, the net benefit increases to $5.74 billion per annum and the BCR increases to 5.6:1. Dollars per DALY averted falls to $36,399, which is highly cost effective by WHO standards. All of these benefit measures improve with additional coverage.

TABLE 6-8: INCREMENTAL BENEFITS OF BEST PRACTICE VS CURRENT TREATMENT

Treatment	Coverage	Additional DALYs averted	Additional cost $m	ICER ($/DALY)	Additional benefit ($m)	Incremental (BCR)
Best practice	Current	9,832	-120	-12,206	2,120	-17.7
Best practice	Realistic	22,442	195	8,667	4,371	22.5
Best practice	All	38,838	258	6,640	7,643	29.6

In terms of incremental cost effectiveness ratios (ICER), best practice treatment at current coverage dominates current practice at current coverage, as it both costs less and results in more DALYs being averted. Under the model, the extra DALYs averted by moving from current practice and current coverage, to providing best practice to everyone with mental illness, could cost as little as $6,640 per DALY.

[17] Access Economics has used DALYs rather than YLDs, as DALYs are the gold standard in health economics. This assumes that savings in YLD and DALYs for (current or best practice) treatments are equi-proportional.

[18] Measures with $/DALY costs between one and three times GDP/capita are considered cost effective. Measures costing less than GDP/k (currently around $50,000) are considered highly cost effective. http://www.who.int/choice/costs/CER_thresholds/en/index.html

7. EARLY INTERVENTION / PREVENTION

Andrews et al (2004) estimated that even best practice treatment, if applied to 100% of the population with mental illness, would still only avert 40% of the burden of disease. This underscores the importance of prevention and early intervention, for example to prevent a second episode of psychosis from occurring (Access Economics, 2008), to prevent relapse and reduce severity. This chapter examines efforts to prevent and better manage mental illness for a number of conditions.

There is a continuum of such interventions.

- Interventions that occur when a person is first diagnosed with an illness, and which are designed to prevent further episodes, are referred to as **early intervention**.
- Interventions that take place when a person is displaying symptoms of the disease but is yet to be diagnosed (known as prodromal) are referred to as **indicated interventions.** As Merry (2007) notes, there is considerable overlap between indicated intervention and early intervention.
- Interventions aimed at people who are at risk of mental illness (e.g. because of environmental or genetic factors) but who have not displayed symptoms, are referred to as **targeted interventions** (also known as selected interventions).
- Finally, interventions aimed at whole populations are known as **universal interventions**.

Youth is the ideal time to stage such interventions. Over 75% of all serious mental health and substance use disorders commence before the age of 25 (Kessler et al, 2005). Thus, preventively orientated intervention targeted to young people aged 12-25 has the capacity to generate greater personal, social and economic benefits than intervention at any other time in the lifespan.

7.1 DEPRESSION

There is evidence from longitudinal studies suggesting that intervening in the first episode of depression may be crucial in halting the development of recurrent episodes. Kendler et al (2000) note that a large number of adult studies show that psychosocial stressors, often in the form of major stressful life events, play a greater role in the onset of the first episode of depression than in subsequent episodes. This implies that subsequent episodes require decreasing external triggering.

- There have only been a few such studies of depression in youth. Lewinsohn et al (1999) found that major life events were a stronger predictor of the first episode of a major depressive disorder than recurrent episodes. Recurrent episodes, on the other hand, were more strongly predicted by the interaction between depressed mood and negative thinking, suggesting that while characteristics of the environment were the critical predictors of first episodes, characteristics of the individual - potentially influenced by previous experiences of depression - are the major predictors of subsequent episodes.

Prevention programs for youth depression do not appear to have been very effective. Horowitz and Garber (2006), in their meta-analysis of depression prevention interventions in youth and children conclude: 'Do these programs prevent depression? The current analysis indicates that there is yet very little evidence to support the idea that they do.'

Evidence for the efficacy of early intervention in depression in youth is conspicuous by its absence. Allen et al (2007), in a paper entitled 'Early intervention for depressive disorders in young people: the opportunity and the (lack of) evidence', state that:

> *Despite a great deal of research being directed to the prevention of depressive disorders in children and adolescents …there are no studies, either in adults or in adolescents, of treatment or prevention of relapse, specifically focused on the first episode of depression.*

7.2 ANXIETY

Neil and Christensen (2007) report on an audit of prevention and early intervention programs for anxiety in Australian schools. They found that four of the five indicated interventions for anxiety were associated with short-term or long-term reductions in symptoms. Six of the ten universal interventions (all using a CBT-based program called FRIENDS, which includes follow up booster sessions) reported lower anxiety immediately, and up to 36 months later.

Programs run by school staff do not appear to be as successful as those run by clinical psychologists (who are in short supply). Hunt et al (2009) report that the Queensland Early Intervention and Prevention of Anxiety Project for 7-14 year olds was largely successful. At two years follow up, only 20% of the children in the trial group met criteria for an anxiety disorder, compared to 39% for those in the control group.

However, this program was run by clinical psychologists. When the authors repeated the experiment in a randomised controlled trial using school staff to run the program, there was no difference in diagnosis or health care use at either two or four years follow up.

While prevention programs for anxiety in youth appear to be more successful than for depression, again there appears to be little or no evidence on early intervention programs.

7.3 SUBSTANCE USE DISORDERS

While experimentation with both licit and illicit substances is common among youth populations, early onset and frequent use are strongly associated with increased risks for the development of mental health problems, as well as a range of other adverse outcomes, in late adolescence and early adulthood. Lubman et al (2007) note that teenagers who smoke tobacco regularly (while not classified as substance abuse in ICD10) are more likely to have physical and mental health problems in older adolescence, Early-onset regular cannabis use has been associated with psychosis, depression, and anxiety; and early involvement with inhalants and polydrug use also appear to be markers of risk for later substance misuse.

Universal school-based drug education programs in Australia have been found to be effective in preventing and delaying the onset of drug use and reducing drug consumption over the short term but their long-term effectiveness is yet to be determined (Midford et al, 2001). The Gatehouse Project has been developed in Australia as an enhancement program for use in the secondary school environment. It incorporates professional training for teachers and an emotional competence curriculum for students. A recent randomised trial suggested exposure to the program led to overall reductions in early alcohol, tobacco and drug use (Bond et al, 2004).

A meta-analysis by White and Pitts (1998) of ten well-designed studies of school prevention programs that were designed to reduce the prevalence and onset of drug use found a small positive effect, but also found that program gains dissipated over time.

7.4 EATING DISORDERS

WHO (2004) reports that anorexia is the third most prevalent chronic condition in American adolescent females, after obesity and asthma. An Australian study (O'Dea and Abraham, 2000) of an interactive program targeting self-esteem in young adolescents and eating attitudes/behaviour showed that, 12 months after the program, participants showed improved body satisfaction, more positive self-esteem and social acceptance, and a lower drive for thinness. Adolescents at high risk showed an increase in body weight while control at-risk students showed a decrease. However, the WHO (2004) reporting on this and similar international studies found that while they have achieved positive results on a number of fronts, 'no study has found any evidence for reduced onset of eating disorders as a result of such interventions.'

Similarly, a Cochrane Review revealed empirical support for the efficacy of interventions involving media literacy and advocacy resulting in less internalisation or acceptance of societal ideals of female appearance, but not for interventions directly addressing adolescent abnormal eating attitudes and behaviours (Pratt and Woolfenden, 2002).

7.5 PSYCHOSIS

Until recently, the dominant paradigm in the mental health profession with respect to psychotic illness was one of 'neo-Kraeplinian concepts of inevitable decline' (Killackey et al, 2007). This has meant that treatment afforded to people with psychotic conditions did not extend greatly beyond palliative care, with little effort devoted to rehabilitation.

However, over the last 15 years or so – starting in Melbourne – there has been mounting evidence that early and active intervention can be effective in preventing a first episode of psychosis (FEP) from leading inexorably to further episodes.

Key elements of successful interventions include:

- low-dose atypical[19] antipsychotics are offered as medication of first choice;
- CBT is routinely available;
- family interventions are routinely available;
- treatment programs are routinely provided for vocational recovery, continuing care, relapse prevention; substance misuse harm reduction;
- families and key supporters receive effective services appropriate to their needs, and access to advocacy support as appropriate; and
- there is early engagement of families and close friends, who are encouraged to feel valued as partners in care.

Access Economics (2008) examined the cost effectiveness of early intervention (EI) versus treatment as usual (TAU). EI trials were found to both cost less than TAU trials ($6,805 against $8,796), and result in a lower burden of disease (0.29 DALYS incurred against 0.31). In terms of incremental cost effectiveness, EI dominated TAU.

Based on AIHW figures (Begg et al, 2007) on FEP incidence per year in Australia., and assuming treatment was universally applied and maintained over the 'critical period' of five

[19] Atypical medicines are essentially ones having low side effects

years after the first episode, Access Economics (2008) estimated that the net present value of savings for each year's cohort of first-time psychotics would be $212.5 million.

7.6 POTENTIAL COST EFFECTIVE ANALYSIS OF PREVENTION / EARLY INTERVENTION

As noted above, there have been comparatively few studies of the effectiveness of prevention and youth mental illness in Australia, fewer still of early intervention, and none (that Access Economics was able to uncover) providing sufficient information to conduct CEA.

In order to conduct an economic evaluation of the cost effectiveness of prevention/early intervention initiatives, two elements are needed – a measure of costs and a measure of benefits.

Ideally, benefits should be measured in DALYS (or QALYS[20]); but changes in diagnostic outcomes or a robust health-related quality of life index would suffice. Also, given that the costs of mental illness are not just its burden of disease, benefits such as increased employment and reduced carer costs would also be good, collected through short entry and exit surveys perhaps.

On the cost side, ideally services provided would be broken down by type of mental illness treated and nature/extent of the treatment (eg, physician, specialist, allied health professional, pharmacological, inpatient). Data for such measures ideally should be collected as part of routine performance reporting.

- Given the episodic nature of many mental illnesses, ideally there should be three to five years follow up data after first intervention / treatment, which would require matched records.

Finally, the aim of an evaluation would not just be to determine the cost effectiveness of the program at hand; but also how well it ranks compared to existing treatment options.

- The gold standard for doing this is a large-scale prospective randomised controlled trial. However such exercises require a lot of time and money, and there may also be ethical considerations in such an approach.
- Failing such an outcome a 'Claytons' control group could be modelled along the lines of Andrews et al (2004) using data from ABS (2009), for patients of matching age, gender and disease to the intervention group.

There is a need for more such research in this area in order to identify cost effective methods for preventing and treating youth and other mental illness in Australia.

[20] Quality Adjusted Life Years are the inverse of DALYS. The main difference is that disability is subjectively determined in QALYS, and determined by experts in DALYS.

8. COST SUMMARY AND CONCLUSIONS

This final chapter summarises costs of youth mental illness by type of cost and by bearer, as well as drawing conclusions from the analysis of diagnostic issues and cost effective interventions to develop a set of recommendations for governments, building on strategies recommended in previous evidence-based reviews.

8.1 COST SUMMARY

In 2009, the **financial cost of mental illness in people aged 12-25 was $10.6 billion** (Table 8-1). Of this:

- $7.5 billion (70.5%) was productivity lost due to lower employment, absenteeism and premature death of young people with mental illness;
- $ billion (15.5%) was the DWL from transfers including welfare payments and taxation forgone;
- $1.4 billion (13.4%) was direct health system expenditure; and
- $65.5 million (0.6%) was other indirect costs comprising informal carer costs and the bring-forward of funeral costs.

Additionally, **the value of the lost wellbeing (disability and premature death) was a further $20.5 billion**.

- In per capita terms, this amounts to a financial cost of $10,544 per person with mental illness aged 12-25 per year. Including the value of lost wellbeing, the cost is estimated as $31,014 per person per year (Table 8-1).

TABLE 8-1: MENTAL ILLNESS, TOTAL COSTS BY TYPE OF COST AND BEARER, AUSTRALIA, 2009

	Individuals	Family/ Friends	Federal Government	State and Territory Governments	Employers	Society/ Other	Total
Total cost ($ million)							
Burden of disease	20,538	0	0	0	0	0	20,538
Health system costs	124	122	607	352	0	209	1,414
Productivity costs	4,709	0	2,298	0	451	0	7,459
Carer costs	0	42	20	0	0	0	62
Other Indirect costs	0	3	0	0	0	0	3
Deadweight losses	0	0	0	0	0	1,640	1,640
Transfers	-2,429	0	2,429	0	0	0	0
Total financial costs	*2,404*	*168*	*5,354*	*352*	*451*	*1,850*	*10,579*
Total costs including burden of disease	22,943	168	5,354	352	451	1,850	31,118
Cost per person aged 15-25 with mental illness ($)							
Burden of disease	20,470	0	0	0	0	0	20,470
Health system costs	123	122	605	351	0	209	1,410
Productivity costs	4,694	0	2,291	0	450	0	7,434
Carer costs	0	42	20	0	0	0	62
Other Indirect costs	0	3	0	0	0	0	3
Deadweight losses	0	0	0	0	0	1,635	1,635
Transfers	-2,421	0	2,421	0	0	0	0
Total financial costs	*2,396*	*168*	*5,336*	*351*	*450*	*1,844*	*10,544*
Total costs including burden of disease	22,866	168	5,336	351	450	1,844	31,014

The shares by each type of financial cost are illustrated in Figure 8-1, while the financial cost shares by bearer are shown in Figure 8-2.

FIGURE 8-1: FINANCIAL COSTS OF MENTAL ILLNESS, BY TYPE OF COST (% TOTAL)

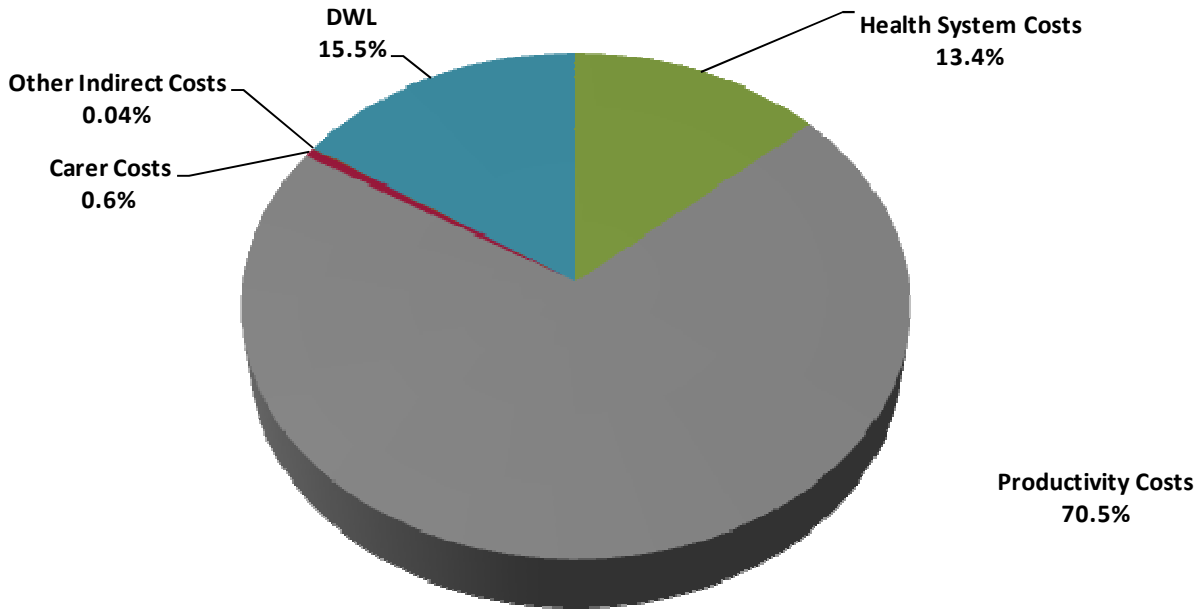
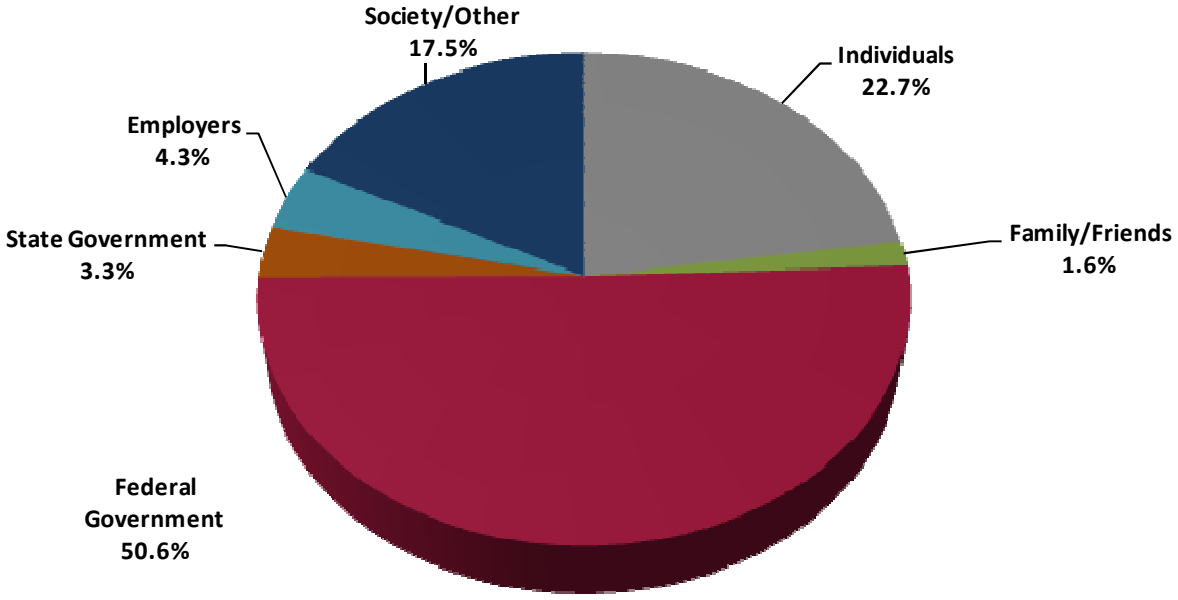


FIGURE 8-2: FINANCIAL COSTS OF MENTAL ILLNESS, BY BEARER (% TOTAL)



Individuals aged 12-25 with mental illness bear 22.7% of the financial costs, and their families and friends bear a further 1.6%. The Australian government bears 50.6% of the financial costs (mainly through taxation revenues forgone and welfare payments). State and territory governments bear around 3.3% of the costs, while employers bear 4.3% and the rest of society pays the remaining 17.5%.

If the burden of disease (lost wellbeing) is included, individuals bear 73.7% of the costs and the Australian government bears 17.2%, state/territory governments 1.1%, with family and friends bearing 0.5%, employers 1.4%, and others in society 5.9%.

8.2 CONCLUSIONS

The ABS data analysed in this report show that, despite the high costs and disease burden of youth mental illness, young people aged 16-24 with mental illness received less treatment than the average for people with mental illness of all ages.

- 35% of the all-age population received some treatment. However, only around 25% of people with mental illness aged 16-24 received any treatment.
- Only 15% of males aged 16-24 received any treatment for their mental illness, which is concerning given the relatively high number of suicides in this age cohort.

A number of Australian studies have focused on assessing the efficacy and cost effectiveness of evidence-based interventions for mental illness, compared to current care interventions. There are two main types: studies that focus on the effects of specific evidence-based interventions (Vos et al, 2005a and 2005b, Haby et al, 2004, Vos et al., 2004) and studies that focus on hypothetical optimal treatment package (Issakidis et al, 2004, Sanderson et al, 2003).

However, studies focusing on mental illness in Australian youth appear rare.

Andrews et al (2004) found that current treatment averted around 13% of the burden of mental illness. Partly this may be because, while many mental illnesses are chronic, current treatment often consists mainly of managing symptoms of the current episode. For example, Vos et al (2004) commented on current treatment:

> *Because the vast majority of people with depression experience multiple episodes over a lifetime and are particularly prone to relapses shortly after an index episode, there are convincing arguments for treating all depression as a chronic disorder and not just those with recurrent or more severe episodes as recommended in current treatment guidelines.*

Access Economics has repeated the Andrew et al (2004) exercise, updating costs to 2009, and applying it only to young people aged 15-25 with mental illness.

- Results indicate that current treatment is worth undertaking, resulting in annual net benefits to society of $3.74 billion, and a benefit to cost ratio (BCR) of 3.26 to 1. Current treatment costs $62, 420 per DALY averted, which is classified as cost effective by WHO measures, given that Australia's GDP per capita is around $50,000.
- However, moving to best practice treatment is considerably more effective. Applied to current patients, the net benefit increases to $5.74 billion per annum and the BCR increases to 5.6:1. Dollars per DALY averted falls to $36,399, which is highly cost effective by WHO standards. All of these benefit measures improve with additional coverage.

In terms of ICERs, best practice treatment at current coverage dominates current practice at current coverage, as it both costs less and results in more DALYs being averted.

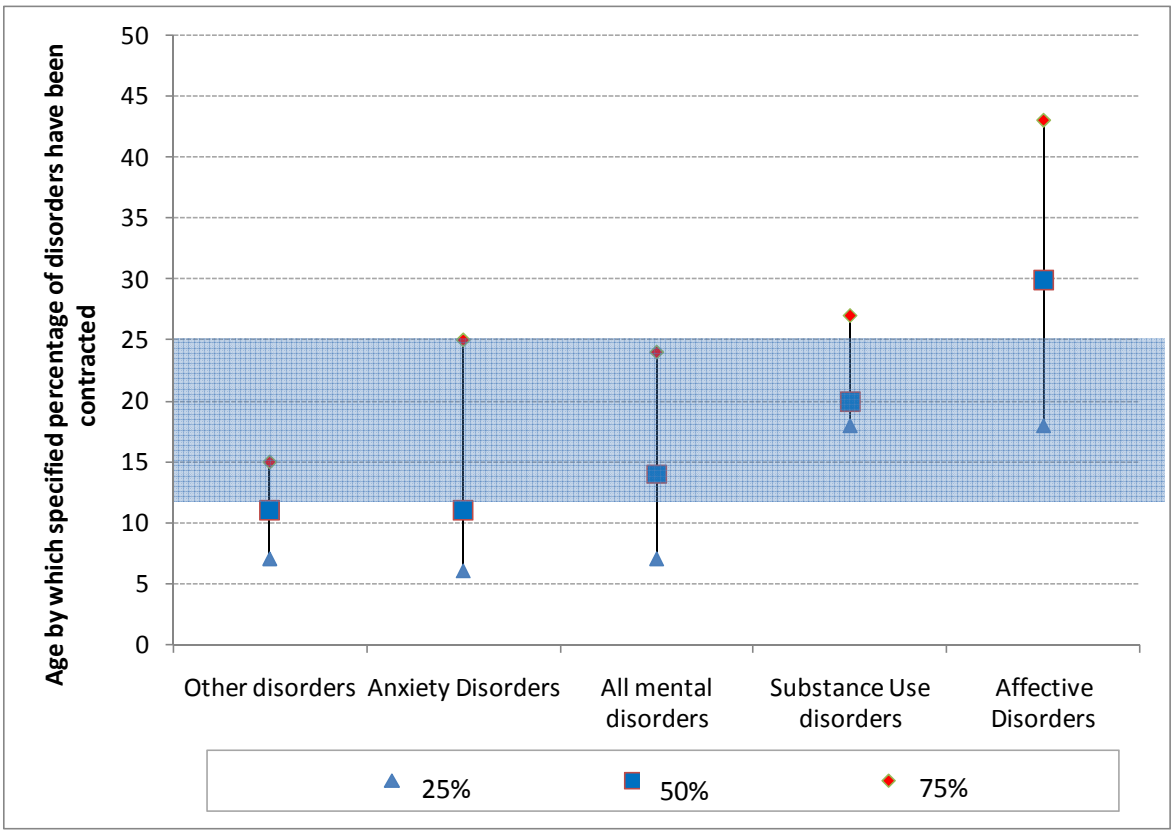
- The extra DALYs averted by moving from current practice and current coverage, to providing best practice to everyone with mental illness could cost as little as $6,640 each.

Andrews et al (2004) estimated that even best practice treatment, if applied to 100% of the population with mental illness, would still only avert 40% of the burden of disease. This underscores the importance of prevention and early intervention, for example to prevent a second episode of psychosis from occurring (Access Economics, 2008).

Early and preventive interventions show promise in reducing the burden of mental illness, particularly in young people. Kessler et al (2005) report that 50% of all serious mental health and substance use disorders commence by the age of 14, and 75% commence by the age of 25 (Figure 8-3). Affective disorders are the only type of mental illness that the majority of people (50%) contract at ages older than youth (12-25). And even then, the average age is still relatively close to the target group, at 30 years.

- Thus, preventively oriented interventions targeted to young people aged 12-25 has the capacity to generate greater personal, social and economic benefits than intervention at any other time in the lifespan.

FIGURE 8-3: AVERAGE AGE OF ONSET (QUARTILES) BY DISORDER



Note: Shaded blue area is target age group – 12-25 year olds.
Source: Kessler et al (2005).

There have been comparatively few studies of the effectiveness of prevention and youth mental illness in Australia, fewer still of early intervention and seemingly none providing sufficient information to conduct cost effectiveness analysis.

In order to conduct an economic evaluation of the cost effectiveness of prevention/early intervention initiatives, two elements are needed – a measure of costs and a measure of benefits. Data for such measures ideally should be collected as part of routine performance reporting. The aim of an evaluation would not just be to determine the cost effectiveness of the program at hand; but also how well it ranks compared to existing treatment options. There is a need for more such research in this area in order to identify cost effective methods for preventing and treating youth and other mental illness in Australia.

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