A WAY FORWARD:
Equipping Australia's Mental Health System for the Next Generation

REACH OUT.COM

EY
Building a better working world

About the Authors

ReachOut Australia

ReachOut Australia is the organisation behind ReachOut.com, Australia's leading online youth mental health service. With a 17-year history of delivering online mental health services focused on prevention and early intervention, ReachOut.com provides information, self-help tools and resources, online support and referral pathways so that young people can get the help they need and lead happy and well lives.

EY

EY is a global leader in assurance, tax, transaction and advisory services. The insights and quality services we deliver help build trust and confidence in the capital markets and in economies the world over. EY develops outstanding leaders who team up to deliver on our promises to all of our stakeholders. In so doing, we play a critical role in building a better working world.

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The ReachOut.com/EY Relationship

ReachOut Australia is EY Australia's first national strategic community relationship. Launched in 2012, the three-year relationship aims to:

- contribute to and challenge the national dialogue around mental health through reports such as this and the previous *Counting the Cost* and *Crossroads* reports;
- provide information and support for EY staff to enhance their own mental health and wellbeing and in doing so confirm EY's commitment to addressing mental health issues in the workplace; and
- support the service that ReachOut.com directly provides to hundreds of thousands of young people each year by creating greater awareness about the importance of preventing the development and progression of mental illness, especially among young people.

This is the third in a series of reports examining the current and future states of mental health and mental health service provision in Australia. The first report, *Counting the Cost*, examined the economic impact on the Australian economy of young men with mental illness, while *Crossroads* looked at the cost to the health-care system of meeting predicted demand using current models of care, indicating a compelling need to redesign the system.

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The Challenge

By the Numbers

45% of all Australians will experience a mental health problem over the course of their lives; 1 in 5 will do so in any given year.

75% of mental health problems first appear before the age of 25, yet more than 70% of young women and 80% of young men who need help and support don't get it.

Poor mental health in young people costs Australia at least $6.29 billion per annum, including $1.3 billion in direct health costs and $1.2 billion in unemployment and disability payments.

If we continue to use only traditional service delivery approaches, a further $9 billion (in salaries alone) would be required over the next 15 years to double the number of people receiving help.

Despite intense effort and increased investment in mental health service delivery in Australia there continues to be significant unmet need for mental health services. Left untreated, mental health problems can worsen, leading to significant negative impacts on every aspect of a person's life.

There are also substantial economic impacts, with the World Economic Forum forecasting that over the next two decades the global economic cost of mental illness will exceed that of cancer, diabetes and respiratory ailments combined.[1]

More help must be made available to more people, more quickly.

Australia's National Mental Health Commission has recently completed a wide-ranging review of the country's entire mental health system, examining the efficiency and effectiveness of existing programs and services.

Complicating the picture, however, is the fact that health expenditure in Australia is growing rapidly (rising by 74% in the last decade alone),[2] with the recent *Intergenerational Report* showing that government has limited, and steadily reducing capacity to provide the level of investment required to fully meet Australia's current and future health needs.

We need to undertake the long-term reform required to redesign and resource the mental health system while also providing more help, to more people, right now. We cannot afford to deny another generation access to mental health care and support.

The Opportunity

As Australia undertakes the complex and long-term work required to reform and grow its mental health system we can take action now, with minimal investment to immediately improve the wellbeing of individuals and reduce the broader social costs associated with poor mental health.

First, we must embrace and promote scalable online interventions as the "first line of defence" in a system of mental health stepped care.

Based on our literature review and a range of online services, we know that doing so will:

- significantly boost the overall capacity of the mental health system, so that more people get help;
- deliver this additional capacity at least five years sooner than it would take to build capacity in the health workforce, so that many more people can get help sooner; and
- become less costly to deliver per person as more people take up the services, as opposed to face-to-face services which become more costly.

Australia has been a world leader in the design, development, delivery and evaluation of e-mental health interventions; the task now is to fully realise their benefits.

To make the most of the potential of e-mental health, it is time to integrate online services into the broader mental health system, promote their use to health professionals and consumers and provide ongoing, sustainable funding.

Second, we must intervene early to prevent the development and progression of mental illness, especially among young people.

Evidence shows that a concerted prevention/early intervention effort in Australia can deliver significant benefits by preventing individuals from experiencing the effects of poor mental health, and avoiding financial costs to the individual, government and community.

Our scenario testing found that:

- a school-based prevention program, delivered online, would represent a very cost-effective intervention approach by international standards; and
- an early intervention treatment program, delivered online, could help more than 78,000 young people recover from their depression and/or anxiety, avoiding more than $350 million in costs to the Australian economy.

Early intervention through low-cost, widely available e-mental health services should be a top priority for mental health service reform, and increased government investment would improve the mental health of the community while reducing costs.

A Way Forward

Reform of the existing mental health system is likely to be complex and to take time. But we cannot afford to risk losing another generation to the lifelong effects of poor mental health.

Smart, small investments made now could save hundreds of thousands of people from the crippling effects of a lifetime of poor mental health. These investments – along with the promotion and use of existing e-mental health services – will enable us to start providing immediate help to people who currently struggle alone.

The time to start is now.

Introduction

Nearly half of all Australians will experience a mental health problem over the course of their lives.[3] Timely and appropriate help-seeking, especially during adolescence, can reduce the long-term health, social and economic impact of many of these mental health problems,[4] yet studies repeatedly show that the majority of people experiencing a mental illness don't get the help they need.[5]

This problem is especially pronounced among young people, with 70% of young women and 80% of young men who experience a mental illness receiving no help at all.[6]

In addition, recent Australian research has shown a significant gap in access to psychiatrists and clinical psychologists, with those from higher socio-economic areas being up to three times more likely to access these services than those from lower socio-economic areas, despite some evidence showing higher rates of mental illness among people living in disadvantaged areas.[7]

The need to improve help-seeking rates is well recognised within the mental health sector and by governments. For example, in both its 2012 and 2013 Report Cards the National Mental Health Commission called for an increase in the delivery of "timely and appropriate mental health services and support from 6–8% to 12% of the Australian population".

This call has subsequently been repeated in the recently released mental health plans of both the New South Wales and Western Australian governments, and has also been reiterated by all non-government players in the mental health sector.

"We are equal citizens who should expect to find high quality, timely mental health support in our community when we need it."

John Feneley, NSW Mental Health Commissioner[8]

However, this determination to improve help-seeking rates is undermined by the considerable capacity constraints in the current mental health-care system. Previous work by the authors in the *Crossroads*[9] report showed that even a relatively modest increase in the proportion of people seeking help for mental health difficulties, combined with projected Australian population growth, would generate demand that could not be absorbed by the traditional mental health system without very significant additional investment.

Similarly, the *Time to Service*[10] report noted the "unprecedented pressure on all parts of the mental health system", while the Fourth National Mental Health Plan[11] identified a need to significantly increase the capacity of the sector in order to meet the existing gap in help-seeking.

There is no question that additional mental health funding is required to build the capacity of existing services. However, the current size of the gap between mental health demand and supply shows that we must also find new ways to use existing resources to help more people. In *Crossroads* we recommended the development of a 21st-century mental health system which:

- is structured around a stepped care model that provides a range of help options of varying intensity to meet people's differing levels of need;
- increases the proportion of investment into mental health promotion, prevention and early intervention; and
- fully integrates e-mental health interventions and services throughout the system.

This report therefore expands on those recommendations by outlining further potential benefits of a new way forward for Australia's mental health system.


INBOX
MOUNTAIN
ALLAMA

The Case for Change

Mental Health in Australia: Too Costly to Ignore

Key Mental Health Facts and Stats

45% of all Australians will experience a mental health problem over the course of their lives; 1 in 5 will do so in any given year.[12]

75% of mental health problems first appear before the age of 25.[13]

Timely and appropriate help-seeking is critical, yet more than 70% of young women and 80% of young men who need help and support aren't getting it.[14]

A recent study conducted by the University of Melbourne's Professor Anthony Jorm, which analysed data from 28 developed and developing countries, found that only a minority of people received treatment for mood, anxiety and substance use disorders in the year of onset.[15]

For those who did eventually get treatment, the delay between onset of illness and access to treatment ranged from 1 to 14 years for mood disorders, 3 to 30 years for anxiety disorders, and 6 to 18 years for substance use disorders. These findings are similar to Australian research showing that it takes an average of 6.9 years for those experiencing anxiety and mood disorders to recognise that they have a disorder, and a further 1.3 years to get help after developing this recognition.[16]

Even among those who do receive care, many don't receive the most suitable evidence-based care, thereby likely further delaying the speed and extent of their recovery.[17]

This is particularly the case for those living in geographically remote and lower socio-economic areas. Findings from a recent study that explored access to health services subsidised by Medicare showed socio-economic and geographical disparities in the use of Better Access and related Medicare services despite claims about the universality of these services.

Increased remoteness was consistently associated with less access to services. Also, those living in lower socio-economic areas were less likely to access psychological and psychiatric services. The researchers further argued that the findings are compatible with a situation in which higher-paid professionals tend to practise closer to home.[18]

These statistics are particularly alarming when we consider the far-reaching impacts of mental illness, which affects every aspect of people's daily lives and, if left untreated, results in very significant costs to the person and the community.

Without appropriate care, support and management, mental health problems do not only become more severe, but may often lead to other difficulties including social withdrawal, the breakdown of family and personal relationships, poor education[19] and employment outcomes,[20] over-representation in the justice system,[21] increased mortality rates and high levels of health and social service use.[22]

In addition to the significant personal costs incurred both by people experiencing mental illness and by their loved ones, poor mental health also leads to significant economic impacts for the individual, the economy and society more broadly.

For example, we recently updated (to today's dollars, and using current data) and expanded the economic analysis conducted in the 2013 report *Counting the Cost* [23] to include young women. We found that, taking a very conservative approach, mental illness in young people aged 12–25 costs the Australian economy at least $6.29 billion a year.[a]

Access Economics has estimated that this figure could be as high as $10.6 billion per year.[24] Another recent report from Medibank and the Nous Group estimated that the government spend on direct health costs alone for the whole population was likely to be in excess of $13.8 billion per year.[25]

The human and economic costs of poor mental health cannot be ignored. We must find a way to reduce these costs by ensuring that help is available as early as possible to those who need it.

[a] For detailed information on the methodology used to derive these figures, please refer to Appendix A. For more detailed information on the 2012 study, refer to the author's 2012 report *Counting the Cost – The Impact of Young Men's Mental Health on the Australian Economy.*

A System Constrained by Time and Money

Crossroads also sought, for the first time, to explore the existing mental health system's capacity to deliver the increased help that is so clearly required. Our investigations revealed that even a relatively modest increase in the proportion of people seeking help for mental health difficulties, combined with projected Australian population growth over the next 15 years, would produce a cumulative increase in the use of mental health services ranging from 135% to 160% for selected mental health professions.

If nothing changes, this increased use would require an additional 4500 general practitioners (GPs), 2150 psychiatrists and 2150 clinical psychologists in order to meet demand.

The burden on the taxpayer would also increase significantly, with the cost of increased salaries alone rising to $1.75 billion per year by 2027, cumulatively adding $9 billion (in today's dollars) to Australia's health spend over 15 years.

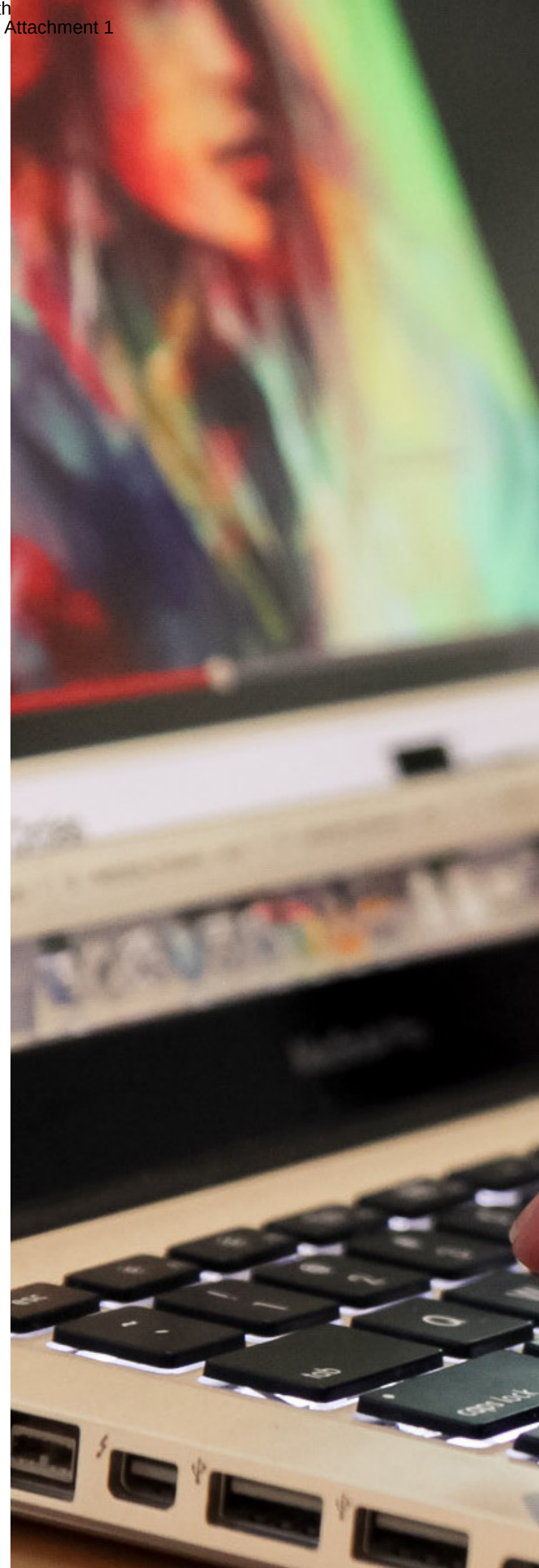
In the context of Australia's current, fiscally constrained environment, this reality presents a considerable challenge. Health expenditure in Australia is already growing rapidly (rising by 74% in the last decade alone[26]), with the 2015 *Intergenerational Report* predicting that health-care spending per person is on track to double by 2055. In response, successive governments and federal treasurers have raised concerns about the sustainability of Australia's health system and the need to "rein in" costs.[27]

It would thus appear unlikely that Australian governments will have the necessary funds available at their disposal to invest on a sufficient scale to ensure that a mental health system that is built around face-to-face service delivery can meet the anticipated need.

Moreover, even if such funds were available:

- between 6 and 15 years will be required to train and grow the necessary workforce; and
- substantial capital investment will also be necessary in education and medical infrastructure to ensure delivery.

In addition to continuing to grow the investment in mental health to the extent possible, it is clear that we must also look for ways both to reduce the demand placed on the overall system, and to deliver effective help to those who need it right now, in a way that is immediate, scalable and cost-effective.



A Way Forward

Harnessing the Potential of Technology

Australians are among the world's most prolific users of technology. On average, 86% of Australians access the internet every day, with 44% doing so more than five times a day. The vast majority of online access now takes place via smartphones and mobile devices. With the progressive rollout of faster broadband access, the falling cost of data plans and the increasing proliferation of internet-connected devices, the gap between those who do and do not use technology daily is diminishing.[28]

Key Tech Stats, May 2014[29]

86% of Australians access the internet every day.

68% of internet users went online via three or more devices in the previous six months.

77% of online Australians banked or paid a bill online and 69% used social networking.

76% of online Australians accessed the internet via mobile phone.

44% of smartphone users regularly use between one and five apps, while 46% of Australians believe that using smartphones and tablets increases their happiness.

Additionally, the Australian Communications and Media Authority has found that Australians are increasingly dependent on the internet to obtain information and interact with services, due to flexibility, convenience, choice, cost and time savings.[30]

This dependence is especially evident in obtaining mental health information and support, with research showing that many people, if given the choice, would prefer to access services online rather than face-to-face.[31,32]

Young people are leading this trend, with a large body of research showing that young people go online to seek health information,[33] and in fact prefer this medium for accessing information, advice or support.[34] This includes young people with mental health issues who would otherwise avoid accessing services but are willing to engage with online interventions because of anonymity.[35]

When it was launched 17 years ago, ReachOut.com was the world's first online mental health service. Since then, Australia has become a global leader in responding to consumers' preference for accessing information and support online, with significant, largely private investment directed into the research, design, delivery and evaluation of technology-based mental health services and supports.

E-mental health now spans the entire spectrum of intervention, from health promotion, wellness promotion and psycho-education, to prevention and early intervention, crisis intervention and suicide prevention, treatment and recovery, and peer support.[36]

Delivered in real-time across a number of sites, including the home, workplace and schools, and through clinicians' workplaces, e-mental health services use a variety of different technologies, including online and mobile phone interactive websites, apps, sensor-based monitoring devices and computers.

Evidence shows that these services are effective in improving mental health and wellbeing,[37,38] especially among young people. Furthermore, there are a number of benefits unique to technology-based services, including greater consumer empowerment, anonymity, 24/7 availability, greater accessibility (especially in rural, regional and remote locations), and reduced costs for both consumers and service providers/funders.[39,40]

To this end, the Australian Government has slowly been directing increased attention and investment into e-mental health services. In 2006, the then Federal Government for the first time funded a range of e-mental health services through the Telephone Counselling, Self Help and Web-based Support (Teleweb) Programme, with an e-Mental Health Strategy for Australia later announced in 2012.[41]

However, the full benefits of e-mental health in Australia currently remain unrealised due to a combination of piecemeal and often competitive funding, lack of an over-arching strategy, and minimal integration of e-mental health tools and services with more "traditional" (face-to-face) mental health services and professionals.

Yet e-mental health could provide an excellent "first line of defence" in a system of mental health stepped care, especially given the extremely rapid way in which such interventions can be deployed, and the capacity of online interventions to reach and service huge numbers of people.

Stepped Care Models

Stepped care models focus on matching the level of need to the level of intervention, so that the most effective, yet least resource-intensive treatment is offered first, only stepping up to more intensive treatments as clinically required. This model makes effective use of available (and often limited) resources,[42] and has been demonstrated to be particularly effective in high-prevalence mental health disorders, such as depression, anxiety, and alcohol and drug dependence.[43,44]

In building such a system, the primary objectives should be to:

1. achieve universality of access, ensuring that everyone can access appropriate mental health-care services and support;
2. promote, prevent and intervene early; and
3. get the best and most appropriate care for consumers as they move through the system in the most efficient way possible.

Scalable online interventions	• screening and prevention • information and peer support • self-help early intervention
Primary health care	• on/offline clinical care (psychologists and other professionals) • GPs and mental health nurses • community care
Specialist mental health care	• psychologists and other mental health specialists • hospital/acute care • long-term care, relapse prevention

SCENARIO 1: Using Online Services to Immediately Boost the Capacity of the Mental Health Service System

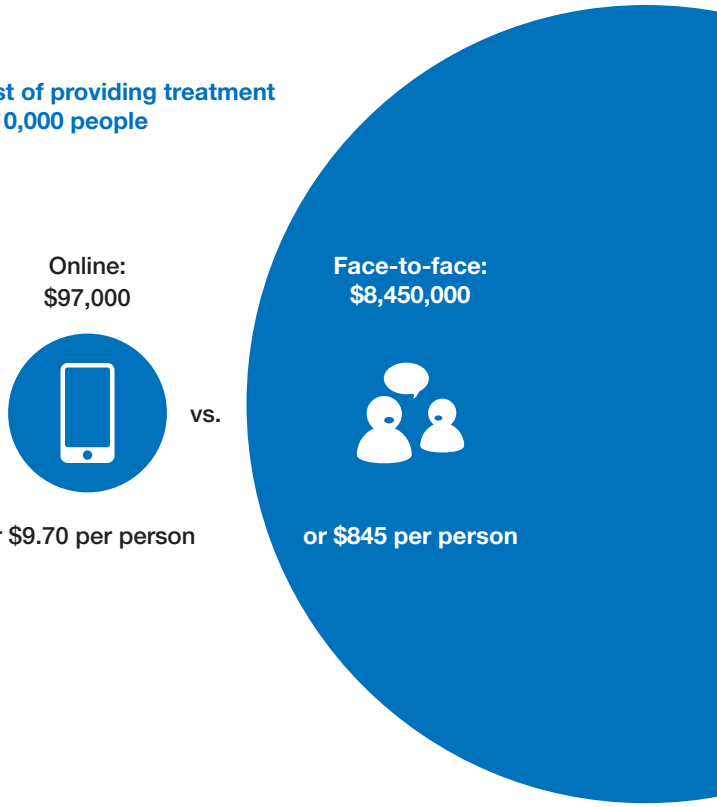
As previously outlined, there continues to be significant unmet need for mental health services in the community. Online services have the potential to substantially boost the overall capacity of the mental health system, particularly in the short term, while broader-ranging reform of the system takes place. Taking this approach enables a capacity-constrained system to provide access to mental health services to those who may otherwise be left untreated, and at a relatively low cost.

Research has shown a range of online interventions to be effective in helping those who are experiencing symptoms of depression and anxiety. For example:

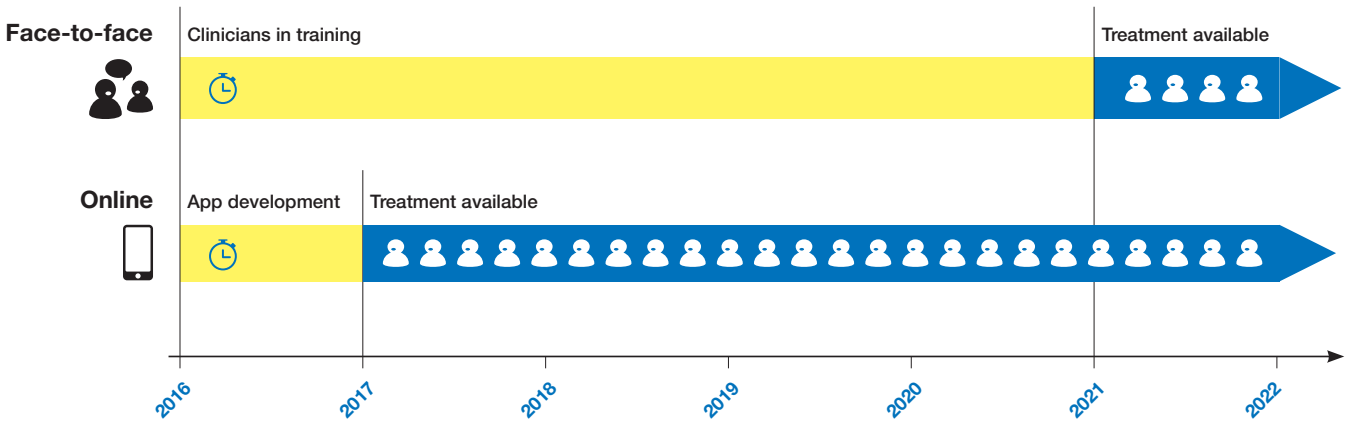
- online psychoeducation, such as that provided by **ReachOut.com** and **Blue Pages** in Australia, has been found to be effective for increasing help-seeking[45] and reducing the severity of symptoms of depression;[46] while
- online cognitive behaviour therapy programs, such as **moodGYM** and **MyCompass** in Australia, have been found to be an effective and acceptable treatment for adults, adolescents and children with depressive or specific anxiety disorders, with outcomes that are equivalent to, and sometimes exceed, those achieved through face-to-face delivery.[47,48,49]

The existence of these interventions means that they are able to immediately absorb unmet demand if consumers are directed to them. This scenario is in contrast to the current system, which relies on face-to-face treatment, and which would require from 6 to 15 years to train new health professionals to extend the capacity of Australia's existing mental health system.

Cost of providing treatment to 10,000 people



Online services can immediately boost capacity of the mental health system



Comparison of online and face-to-face treatment costs (maintenance costs only)[b]

		Online[c]			Face-to-Face	
		Low-end build	Medium-end build	High-end build	Better Access initiative	
YEAR	Number of persons to treat per annum n	Maintenance $50,000 per annum $	Maintenance $74,000 per annum $	Maintenance $97,000 per annum $	$507 per person (6 sessions x $84.50ea) $	$845 per person (10 sessions x $84.50ea) $
2016	0	No capacity to treat until 2017			No capacity to treat until 2022	
2017	1	50,000	74,000	97,000		
	50	50,000	74,000	97,000		
	100	50,000	74,000	97,000		
	500	50,000	74,000	97,000		
	1,000	50,000	74,000	97,000		
	5,000	50,000	74,000	97,000		
	10,000	50,000	74,000	97,000		
	100,000	50,000	74,000	97,000		
2018	As above	As above				
2019						
2020						
2021						
2022	1	50,000	74,000	97,000	507	845
	50	50,000	74,000	97,000	25,350	42,250
	100	50,000	74,000	97,000	50,700	84,500
	500	50,000	74,000	97,000	253,500	422,500
	1,000	50,000	74,000	97,000	507,000	845,000
	5,000	50,000	74,000	97,000	2,535,000	4,225,000
	10,000	50,000	74,000	97,000	5,070,000	8,450,000
	100,000	50,000	74,000	97,000	50,700,000	84,500,000

Scaling up and utilising existing online interventions would add significant capacity to the overall mental health system in the space of just one year, ensuring that help and support could be delivered to increased numbers of Australians not currently receiving it.

In the time that it takes to train additional health professionals, existing online services could be helping literally thousands of people every year who are currently struggling alone. Moreover, as the calculations show, the more people who make use of such online interventions, the more cost-efficient such services would become on a per person basis – reducing to less than $10 per person once 10,000 or more people use the service each year.

[b] For more information on the assumptions and methodology behind these findings, please refer to Appendix B.
[c] Costs associated with building and maintaining an online mental health app.

Comparison of capacity and costs associated with low-end app build and face-to-face treatment, where low-end build ($150,000) is equivalent to training approximately 2.4 psychologists[d]

		Online	Face-to-Face	
		Low-end build $150,000	Train 2.4 new psychologists $150,000	
YEAR	Number of persons to treat per annum n	Maintenance $50,000 per annum $	Better Access initiative $507 per person (6 sessions x $84.50ea) $	Better Access initiative $845 per person (10 sessions x $84.50ea) $
2016	0	No capacity to treat	No capacity to treat until 2022	
2017	1	50,000		
	50	50,000		
	100	50,000		
	500	50,000		
	1,000	50,000		
	5,000	50,000		
	10,000	50,000		
	100,000	50,000		
2018	As above	As above		
2019				
2020				
2021				
2022	1	50,000	507	845
	50	50,000	25,350	42,250
	100	50,000	50,700	84,500
	437	50,000	221,559	369,265 Maximum capacity reached at 437 people
	500	50,000	253,500	
	733	50,000	371,631 Maximum capacity reached at 733 people	
	1,000	50,000		
	5,000	50,000		
	10,000	50,000		
	100,000	50,000		

In comparison, the cost associated with accessing face-to-face support varies from $507 to $845 per person, depending on the number of sessions, so that the total Medicare costs borne by the Federal Government to enable 10,000 new people to obtain treatment can reach as much as $8.45 million per annum.

Furthermore, online services not only become less costly per person as more people use them, but are able to absorb demand from hundreds of thousands of consumers, providing immense scalability in service delivery and significantly improving the overall capacity of the system. We undertook further modelling to explore this potential, considering the capital and recurrent costs to government that would be necessary to scale up face-to-face and online mental health services, and the capacity that could be added to the system via each approach. In each scenario the number of mental health professionals that could be trained for the cost of building an app is estimated, and the associated capacity constraints of each are explored.

[d] For more information on the assumptions and methodology behind these findings, please refer to Appendix B.

Comparison of capacity and costs associated with high-end app build and face-to-face treatment, where high-end build ($290,000) is equivalent to training approximately 4.7 psychologists[e]

		Online	Face-to-Face	
		High-end build $290,000	Train 4.7 new psychologists $290,000	
YEAR	Number of persons to treat per annum n	Maintenance $97,000 per annum $	$507 per person (6 sessions x $84.50ea) $	$845 per person (10 sessions x $84.50ea) $
2016	0	No capacity	No capacity to treat until 2022	
2017	1	97,000		
	50	97,000		
	100	97,000		
	500	97,000		
	1,000	97,000		
	5,000	97,000		
	10,000	97,000		
	100,000	97,000		
2018	As above	As above		
2019				
2020				
2021				
2022	1	97,000	507	845
	50	97,000	25,350	42,250
	100	97,000	50,700	84,500
	500	97,000	253,500	422,500
	848	97,000	429,936	716,560 Maximum capacity reached at 848 people
	1,000	97,000	507,000	
	1,416	97,000	717,912 Maximum capacity reached at 1,416 people	
	5,000	97,000		
	10,000	97,000		
	100,000	97,000		

We also considered the full costs of building and delivering an online mental health service that was much more complex and comprehensive than an online cognitive behavioural therapy (CBT) program or app, to again explore the comparison between the time to treat delays and potential capacity of both a complex online intervention and face-to-face service delivery. Once again, our modelling showed that online services had the potential to help significantly more people, sooner.

[e] For more information on the assumptions and methodology behind these findings, please refer to Appendix B.

Comparison of capacity and costs associated with online mental health service and face-to-face treatment, where mental health service build ($900,000) is equivalent to training approximately 14.5 psychologists[f]

		Online		Face-to-Face	
		Online mental health service build $900,000		Train 14.5 new psychologists $900,000	
YEAR	Number of persons to treat per annum n	Low-end maintenance $100,000 per annum $	High-end maintenance $180,000 per annum $	$507 per person (6 sessions x $84.50ea) $	$845 per person (10 sessions x $84.50ea) $
2016	0	No capacity		No capacity to treat until 2022	
2017	1	100,000	180,000		
	50	100,000	180,000		
	100	100,000	180,000		
	500	100,000	180,000		
	1,000	100,000	180,000		
	5,000	100,000	180,000		
	10,000	100,000	180,000		
	100,000	100,000	180,000		
2018	As above	As above	As above		
2019					
2020					
2021					
2022	1	100,000	180,000	507	845
	50	100,000	180,000	25,350	42,250
	100	100,000	180,000	50,700	84,500
	500	100,000	180,000	253,500	422,500
	1,000	100,000	180,000	507,000	845,000
	2,631	100,000	180,000	1,333,917	2,223,195 Maximum capacity reached at 2,631 people
	4,395	100,000	180,000	2,228,265 Maximum capacity reached at 4,395 people	
	5,000	100,000	180,000		

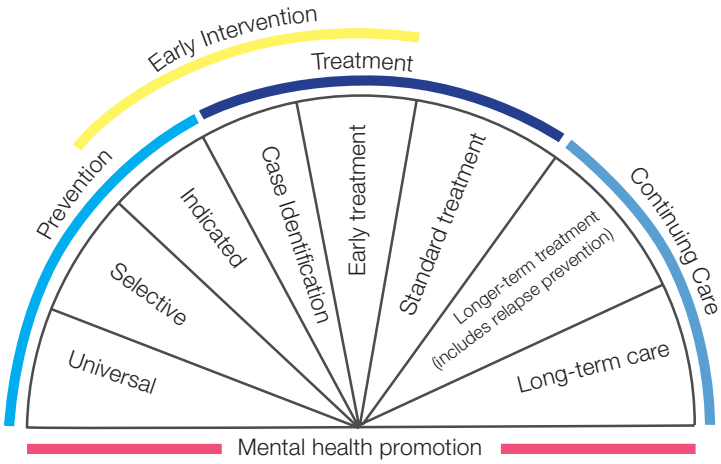
[f] For more information on the assumptions and methodology behind these findings, please refer to Appendix B.

It is thus apparent that online service provision has huge potential to:

- significantly boost the overall capacity of the mental health system, delivering help to many more of those not currently receiving it;
- deliver this additional capacity at least five years sooner than it would take to build capacity in the health workforce, again meaning that many thousands more can get help sooner; and
- become less costly to deliver per person as more people take up the services, as opposed to face-to-face services which quickly balloon into costing many millions of dollars per year.

Our purpose in highlighting the potential for online service provision is not to argue for the replacement of one form of service delivery with another. Instead, given the high level of unmet need that exists right now, it is our position that we should be utilising the well-established, evidence-based online services that already operate in Australia to add more capacity to the overall mental health system, and quickly. By promoting and integrating these services into the broader mental health system we can deliver real help, right now, to the many thousands of people who need it, while we simultaneously continue the longer-term work of reforming and building the broader mental health system.

Figure 1: Mrazek & Haggerty's model of the spectrum of interventions for mental health problems and mental disorders[50]



Investing in Prevention and Early Intervention

Definitions

Prevention generally refers to interventions that occur prior to the onset of clinically diagnosed disorders, and typically focuses on either increasing protective factors or decreasing risk factors with the goal of preventing the incidence of new cases of mental illness. These interventions can further be categorised according to the target group and intervention type:

1. **Universal or primary prevention:** targets the entire population regardless of risk.
2. **Selected prevention:** targets people at high risk of developing mental illness – for example, young people with a family history of mental illness.
3. **Indicated prevention:** targets people with mild signs or subclinical symptoms of potential mental illness, with the aim of preventing further progression into a full-blown disorder.

Mrazek's Spectrum of Interventions, which forms the conceptual framework for Australian and international mental health policy (Figure 1), classifies **early intervention** as spanning across indicated prevention in people with mild symptoms through to the detection and early treatment of people with untreated mental disorders. The goals of early intervention are thus a mix of both preventing progression of illness and facilitating early treatment to promote recovery and reduce the severity and frequency of future episodes (relapse prevention).

Prevention and early intervention together serve to reduce the overall prevalence of mental illness by reducing the incidence of new cases and treating existing cases.

Why Prevention and Early Intervention?

While, as we have shown, it is possible to get more help to more people, we must also turn our attention to reducing the prevalence of mental disorders in Australia if we are to further reduce the economic costs from mental health. There are two ways of doing this, namely by:

- treating existing cases; and
- preventing new cases.

However, a range of studies have found that, even under "ideal conditions", only half of the burden of all mental health disorders could be averted with treatment (both psychological and pharmaceutical).[51] Indeed, Australian research estimates that existing treatment averts only 13–16% of the disease burden from mental health disorders and that, more specifically, even if all cases of depression were treated using evidence-based treatments, only 24–52% of the total disease burden would be averted.[52]

Clearly, then, the prevention of mental disorders in the first instance is critical to reducing the overall burden of mental illness and associated costs while simultaneously reducing demand on stretched downstream clinical care systems.

The evidence regarding prevention and early intervention programs is robust, with agreement across systematic reviews[53,54,55] and meta-analytic studies[56] regarding the effectiveness of selected and indicated (targeted) prevention programs in reducing the incidence of depression and anxiety.[57,58,59,60] In particular, there is strong evidence for preventive interventions that combine screening adolescents for early signs of depression and the subsequent provision of brief CBT to those identified as being at high risk.[61] Such initiatives have been shown to reduce the incidence of depression in adolescents by 35%.[62]

Preventive interventions have also been shown to be highly cost-effective, with Mihalopoulos and colleagues demonstrating through their economic modelling study that prevention programs targeting adolescents in schools achieve cost-effectiveness ratios of $5,400 per disability adjusted life year (DALY)[9] averted, which is well below the $50,000 per DALY value-for-money threshold often used by health policy makers in Australia.[63] These figures are likely to be underestimates of the potential economic savings, given this study only modelled the cost-avoidance of providing treatment, rather than capturing broader positive impacts associated with preventing new cases of depression in areas such as productivity and educational attainment.

Both the National Mental Health Commission[64] and the Hunter Institute have called for increased focus on, and investment into, mental health prevention.[65] Despite this and the overwhelming evidence demonstrating the effectiveness of prevention programs, there has not yet been widespread adoption of such interventions. One potential explanation offered for this lack of uptake by Mihalopoulos and colleagues is that public financing of psychological services in Australia is typically reserved for treatment of existing conditions, not prevention. Indeed, the bulk of mental health funding in Australia is currently directed towards tertiary services: face-to-face clinical and residential treatments, and hospital beds.[66] However, the advent of internet-based options for delivering interventions online, as discussed earlier, offers significant potential for overcoming these barriers.

[9] The effectiveness of preventive interventions outlined in Mihalopoulos et al. (2012) was captured using disability adjusted life years averted, where a DALY (according to the World Health Organization) represents "the sum of years of potential life lost due to premature mortality and the years of productive life lost due to disability".

SCENARIO 2: Modelling the Cost-Effectiveness of Online Prevention Programs

Delivering prevention programs online will likely overcome implementation issues arising from workforce capacity constraints by removing the need for health or educational professionals to administer the programs, thereby enabling delivery at significant scale.

In order to demonstrate these potential benefits, we adapted the economic model developed by Mihalopoulos and colleagues and adjusted the intervention cost to determine the cost-effectiveness of implementing a school-based online program designed to:

- identify young people aged 11–17 with subclinical symptoms of depression through an online screening tool; and
- facilitate their access to online CBT.[h]

We found that the Incremental Cost-Effectiveness Ratio (ICER) for an online screening and treatment prevention, without cost offsets, is substantially below the $50,000 DALY threshold, indicating that an online screening and prevention program provides good value for money. When cost offsets associated with the intervention are included in total costs, the ICER becomes negative, indicating that implementation of the intervention is not only more effective than doing nothing, but in fact becomes cash positive. Our case study thus meets the criteria for a "very cost-effective" prevention intervention – which has been defined as being less than $10,000 per DALY prevented.

Incremental Cost-Effectiveness Ratios (ICER) for face-to-face and online screening and prevention intervention

	Face-to-face prevention intervention compared to "do nothing"[67]	**Online prevention intervention compared to "do nothing" (based on build and maintenance costs)**
	Median point estimate	Point estimate
DALYs averted	5600	5600
Costs of intervention	$47 million[i]	$1.45 million
Cost offsets	$16 million	$16 million
Total costs	$27 million	–$14.5 million
ICER (with cost offsets)	$5400	–$2589
ICER (without cost offsets)	$8200	$259

[h] For further information on rationale, methodology and findings, please refer to Appendix C.
[i] Government and private costs.

SCENARIO 3: Cost Savings from Case Identification and Increased Treatment Rates

While prevention interventions are critical to reducing the prevalence of mental health problems and – as demonstrated – are highly cost-effective, it must be acknowledged that it is impossible to prevent all new cases of depression and/or anxiety. It is therefore essential that we continue to invest in effective early intervention and treatment programs alongside prevention interventions; and again, doing so online presents the opportunity to deliver such programs at scale.

To demonstrate these potential benefits we took the model developed for our *Counting the Cost* report and ran a simulation that explores the potential cost avoidance from providing online treatment to young people aged 13 to 25 who are currently experiencing mild depression and anxiety and not otherwise receiving any treatment. The estimated magnitude of effectiveness of online treatment programs was in turn based on a review of the literature.[j]

Under this scenario, and taking a very conservative approach, we estimate that an online treatment program targeting only young people experiencing depression and/or anxiety who are not otherwise receiving treatment could potentially:

- enable over **78,500** people to recover from their depression and/or anxiety; and
- thereby avoid over **$356.4 million** in costs per annum.

Considering the large evidence base that already exists and the findings of our two small scenarios alone, it is clearly possible to make a significant impact on both the rates of mental illness within the population, and their associated costs to the community, if we increase investment in prevention and early intervention.

"The key is investment in prevention and intervening early … There is substantial evidence of what works both in terms of prevention and support – it is simply a case of putting it as a first priority."

National Mental Health Commission's 2013 National Report Card on Mental Health and Suicide Prevention

[j] For further information on rationale, methodology and findings, please refer to Appendix D.

Conclusion

There is no dispute about the challenges facing Australia's mental health system: the level of unmet need continues to be very great, and the human and financial resources available to respond are too few. The conversations now taking place regarding reform of the broader mental health system and the need for additional investment are both critical and urgent.

However, as we undertake the task of reforming and growing the mental health system with an eye on the future, we risk losing another generation to the lifelong effects of poor mental health in the intervening years unless we also turn our attention to meeting their needs, right now. Fortunately, it is possible to do this if we take just two steps:

First, we must embrace and promote scalable online interventions as the "first line of defence" in a system of mental health stepped care.

Based on our literature review and as demonstrated from a range of models, we know this will:

- significantly boost the overall capacity of the mental health system, so that more people get help;
- deliver this additional capacity at least five years sooner than it would take to build capacity in the health workforce, so that more people get help sooner; and
- be less costly to deliver per person as more people take up the services, as opposed to face-to-face services which quickly balloon into costing many millions of dollars per year.

Australia has been a world-leader in the design, development, delivery and evaluation of e-mental health interventions; the challenge now is to fully realise their benefits. This is not a difficult task. It requires only:

- a commitment to integrate online services into the broader mental health system;
- promotion of their use to health professionals and consumers alike; and
- ongoing, sustainable funding.

Second, we must prevent and intervene early in the development and progression of mental illness, especially among young people.

It is clear both from the scenarios we have presented and from the broader evidence base that a concerted prevention/early intervention effort in Australia has the potential to deliver significant benefits, both in terms of:

- preventing individuals from having to experience the effects of poor mental health; and
- avoiding financial costs to the individual, government and society more broadly.

We must, as the National Mental Health Commission has urged, make this our first priority, and governments, both state and Commonwealth, need to direct investment into these approaches.

There is a clear way forward to address Australia's mental health challenges.

The time to start is now.

Appendix A Methodology: Cost of Illness

Methodology and Results

This section describes the model methodology in detail, and consists of two parts:

- an outline of the model design, including the approach, key components and general assumptions made; and
- the detailed methodology outlining the assumptions and calculations for each cost category.

Introduction to the Model

Approach

Cost-of-illness studies are conducted in order to measure the economic burden of diseases. While they don't provide any information regarding the cost-effectiveness or return on investment of particular approaches or policies, they do provide useful information about the magnitude of costs associated with a particular disease or condition, and, by extension, an estimate of the amount of savings that could be achieved by interventions or policies which impact the costs included in the model.

Accordingly, the objective of this economic model is to provide a quantification of the costs for the 2014 reference year relating to mental illness in young males and females aged 12 to 25, as incurred by different sections of society.

The cost estimates provided by this model represent a conservative estimate, as the model is not intended to be a comprehensive study of all the costs of mental illness to the general economy. As with any economic model, the availability and quality of data requires the use of assumptions. These are described later in this section.

Cost estimates in this model are incurred by four categories of organisations, defined as follows by Drummond and colleagues (2005):[68]

- C1 costs are costs incurred by the government health sector, such as medical, pharmaceutical and hospitalisation costs.
- C2 costs are costs incurred by other sectors, such as welfare organisations, forensic services, educational services, etc.
- C3 costs are any out-of-pocket expenses incurred by patients and their families, such as travel, co-payments and expenditure in the home.
- C4 costs are opportunity costs relating to productivity. Examples include lost productivity due to increased absenteeism from work and reduced salaries due to reduced education levels.[k]

In the current context a human capital approach was used, as it best represents the total costs (from an individual and employer perspective). This approach is based on estimated production losses and associated impacts due to morbidity and mortality. This was estimated from employee earnings in the case of the paid workforce.[69]

The impacts on other non-market activities such as leisure and study are also indirect costs; however, such costs are usually excluded in the calculation of indirect costs due to the difficulty of measuring and defining them. This method also excludes other psychosocial costs of illness – such as pain, suffering and stress – which impact on quality of life.

The procedure in this study involved the determination of three sets of costs:

- mortality costs due to premature death;
- morbidity costs due to work absence (including sick days and unemployment benefits to government if the person is unemployed); and
- morbidity costs due to presenteeism (being present at work but not performing tasks at a maximum capacity).

[k] Productivity costs tend to be used to describe the impact of absence from work, related to premature mortality and/or morbidity. The impacts can be on individuals (e.g. they don't realise their earning potential), employers (the productivity of their firm isn't as good as it can be, or they need to replace – either permanently or temporarily – workers who cannot perform their duties) and government (in terms of welfare payments). This definition is consistent with the Productivity Commission's (2006) use of the term "human capital stream". The human capital stream in this report is concerned with "workforce participation and productivity". Therefore, in the current context, "productivity gains/losses" refers to the effect of mental illness on a young man's ability to participate in the paid workforce, as well as productivity impacts while at work.

Costs may be incurred by the government, the employer or the individual. These costs are added together to produce a total cost.

Bottom-up vs. Top-down
Where possible, a "bottom-up" as opposed to a "top-down" method of calculating costs was preferred, as it provides a more detailed and potentially more accurate depiction of the cost drivers. Where sufficient data was not available, the current model adopted a top-down approach.

Bottom-up costing usually involves the specification of an event pathway, the probability of different events occurring for the population of interest and a cost associated with the event. In contrast, top-down costing takes an aggregated total (usually health expenditure as identified in government accounts) and divides this into categories. The biggest disadvantage with top-down approaches is that important costs may be omitted or misallocated.

The Concept of Marginal Costs
A key concept underlying the model is that the costs are only applied to the marginal number of people affected in the focus cohort. Based on the Australian Bureau of Statistics (ABS) Survey of Mental Health, it was found that people with mental disorders incur higher costs in all cost categories included in our model (e.g. unemployment or disability) relative to people without mental disorders. It was assumed that these differences in costs between those with and without a mental illness are due to the presence of a mental disorder, such that if those with a mental disorder didn't have a mental disorder, their cost rates would revert to those experienced by non-mentally ill people.

Costs have therefore been derived by taking the costs incurred by the cohort experiencing mental disorders and subtracting those incurred by the same cohort if they didn't experience mental disorders.

For example, in relation to unemployment, if the focus cohort didn't have a mental disorder, while they would have lower unemployment rates they would still experience the unemployment rate applicable to people without mental disorders. The difference in the number of unemployed people represents the marginal number of unemployed, and it is to this group that the cost due to mental disorders was quantified.

Review Process
In 2011, a mental health advisory committee comprising mental health specialists, health economists, and health and financial modelling experts was convened to test and validate the 2011 model for comprehensiveness and validity. A series of quality review checks were conducted on the model and the underlying parameter values to ensure the model was acceptable and valid.

The model parameter values have been updated to reflect data available to 2014, and its methodology has remained unchanged since 2011.

Model Scope
Model cost categories are detailed in Table 1. Intangible costs of mental disorders are not included in the current model.

The focus cohort consists of males and females aged 12 to 25 who are experiencing mental disorders. The size of this group as at December 2014 was derived by applying general population growth factors[70] to an equivalent cohort published by Access Economics in 2009.[71]

Access Economics quantified the size of this cohort in 2009 by combining ABS and Australian Institute of Health and Welfare (AIHW) data. The ABS and AIHW definitions of mental disorders vary in scope, which prompted the two datasets to be combined to develop an expanded definition of mental disorders.[I]

We have further split the cohort group into each cost category and calculated the applicable costs for the specific cohort in the model.

[I] Mental illness is a clinically diagnosable disorder that significantly interferes with an individual's cognitive, emotional and social abilities. Mental illness encompasses short- and longer-term conditions, including anxiety disorders, affective or mood disorders (e.g. depression) and substance use disorders (e.g. alcohol dependence). Depending on the disorder and its severity, people may require specialist management, treatment with medicine and/or intermittent use of health-care services. It should be noted that the ABS and AIHW definitions of mental illness vary in scope. This prompted the two data sets used in the economic model to be combined to develop an expanded definition of mental illness. The definition includes the ABS definition (anxiety, affective and substance use disorders) and AIHW definition (childhood, eating, personality and psychotic disorders).

APPENDIX A

Table 1 Model cost categories

				Cohort size ('000)		
Cost category	**Subcategory**	**Drummond et al. (2005)[68]**	**Description**	**Total**	**Male**	**Female**
1 Health	1.1 Health costs	C1, C3	Recurrent and non-capital health cost expenditure (includes out-of-pocket costs)	1,093	521	573
2 Employment	2.1 Personal leave	C4	Cost of additional personal leave taken	612	288	324
	2.2 Reduced personal income	C4	Reduced personal income reflected in reduced wages at the same education level			
	2.3 Reduced education	C4	Reduced earnings due to lower education level			
3 Unemployment	3.1 Lost income	C4	Lost income during the period of unemployment	60	25	35
	3.2 Welfare benefits	C2	Unemployment welfare benefits paid by the government to the unemployed			
4 Imprisonment	4.1 Direct cost	C2	Prison operational costs	3	3	0*
	4.2 Lost income	C4	Lost income during the period of imprisonment			
5 Disability	5.1 Welfare benefits[m]	C2	Welfare benefits paid by the government to the disabled	320	146	174
6 Mortality	6.1 Mortality	C4	Lost income over the life of an individual due to mental illness-related mortality	0.6	0**	0**

*240 females
**413 male deaths, 194 female deaths

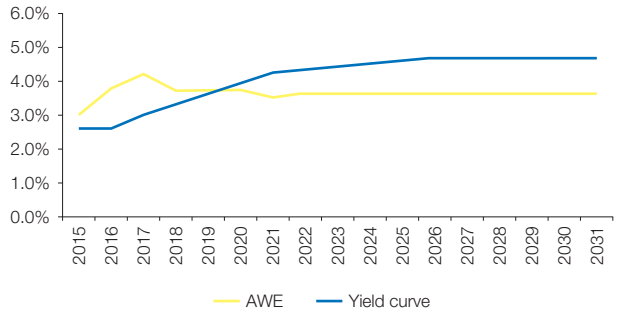
[m] Welfare payments are often excluded in cost estimates from a societal perspective since they represent a transfer of income rather than an opportunity cost of resources. However, from a more limited government economic perspective, transfer payments do have an opportunity cost and have been included in this model.

Assumptions and Limitations

Where possible, primary data sources have been used. Extensive use was made of findings from the Access Economics report and the publication from the 2007 National Survey of Mental Health and Wellbeing in populating the model parameters. Due to data limitations a number of assumptions were made in our model, as follows.

- All costs in the model are expressed in 2014 dollars.
- If a particular statistic (e.g. unemployment or disability) differs between the cohorts with and without mental disorders, then this difference was assumed to be due to the presence of mental disorder.
- The number of young men and women with at least one mental disorder as a proportion of the general population hasn't changed since 2009 (most recent available data).
- Adopted future inflation and discount rates are shown in Figure 1. Inflation rates were based on Access Economics[71] forecasts and future discount rates based on no arbitrage forward rates implied by the market prices of Commonwealth Government bonds as at 31 December 2014.

Figure 1 Adopted inflation rates as at 30 December 2014



Additional assumptions specific to various cost categories in the model are described in each corresponding section.

Detailed Methodology and Results by Cost Category

1. Health Cost Category

1.1 Health Costs

A top-down approach was used to calculate the mental health-care costs of young men and women. Total cost per person was derived from Access Economics[n] data, adjusting for age and gender to align with the cohort in the study. ABS Health CPI inflation[72] was applied to inflate costs to 31 December 2014.

Included costs in the health cost category were:

- hospital expenditures;
- high-level residential care;
- out-of-hospital expenditure; and
- pharmaceutical costs.

Excluded costs from the health cost category were:

- expenditure on non-mental health-related community care;
- capital expenditure;
- public health programs;
- health administration; and
- health aids and appliances.

Non-mental health-related health expenditure that may be incurred by young men and women experiencing mental disorders is not included in the health cost category.

[n] Access Economics (2009) used AIHW allocated health expenditure on mental illness to derive the mental health costs of young people with mental illness (adjusting for age and gender).

APPENDIX A

Health Cost Category: Model Results

The method of allocating health costs to the focus cohort and inflating the costs to 31 December 2014 are shown in Tables 2 and 3.

Some 67.8% of this cost is borne by government, with the remaining 32.2% out-of-pocket payments being made by other parties (individuals and companies).[71] Claims paid by health and injury compensation insurers are classified under individual costs.

Table 2 Mental health expenditure – male

		2004–05		31 December 2014	
Age range	**Focus cohort ('000)**	**$ per all males per year[71]**	**$ per male with mental disorder(s) per year***	**$ per male with mental disorder(s) per year**	**Direct health costs ($m)**
12–14	40.0	30	132	201	8.1
15–19	233.1	205	899	1,377	321.0
20–25	247.4	205	899	1,377	340.6
Total	520.6	—	—	—	669.7

Table 3 Mental health expenditure – female

		2004–05		31 December 2014	
Age range	**Focus cohort ('000)**	**$ per all females per year[71]**	**$ per female with mental disorder(s) per year***	**$ per female with mental disorder(s) per year**	**Direct health costs ($m)**
12–14	26.7	47	156	239	6.4
15–19	245.5	216	718	1100	270.0
20–25	300.7	278	718	1100	330.8
Total	572.9	—	—	—	607.2

* Mental health direct health costs re-expressed as per male/female with mental disorder(s). Based on ABS National Survey of Mental Health and Wellbeing 2007, 22.8% of males and 30.1% of females ages 16 to 24 are experiencing at least one mental disorder. The same proportion is assumed for ages 12 to 15.

2. Employment Cost Category

2.1 Personal Leave

Based on the ABS National Survey of Mental Health, people with mental disorders are around 2.3 to 2.4 times more likely to be out of role[o] compared to those without mental disorders. These calculations are shown in Table 4.

Therefore, we assume that a mentally ill person is more likely to take personal leave if they are in employment. As personal leave is paid by employers with no associated productivity benefit, this results in a cost burden to the employer.

[o] Days out of role: the number of days that a person was unable to work or carry out normal activities or had to cut down what they did because of their health (ABS National Survey of Mental Health and Wellbeing, 2007).

Table 4 ABS "Days out of role" by mental health status[73]

Days out of role	Ave. days*	Males – no mental disorder(s)	Males – with mental disorder(s)	Females – no mental disorder(s)	Females – with mental disorder(s)
0 days	0	76%	59%	73%	46%
1 to 7 days	4	18%	24%	21%	36%
More than 7 days	19	6%	16%	6%	18%
Ave. days out of role (30-day period)	—	1.8	4.1	2.1	4.9
Ratio	—	2.3		2.4	

*Assumption

The average days of personal leave taken by people with and without mental disorders can then be calculated using the personal leave relativities above and the average days of personal leave taken by the general population. These calculations are shown in Tables 5 and 6.

Table 5 Annual days out of role taken by mental disorder status – male

	General population	No mental disorder(s)	With mental disorder(s)
% of employable population with[73]	—	79.7%	20.3%
Average personal leave (days per year) – males	8.93[74]	7.1*	16.2*
Marginal number of personal leave (days per year) – males	—	—	9.2

Table 6 Annual days out of role taken by mental disorder status – female

	General population	No mental disorder(s)	With mental disorder(s)
% of employable population with[73]	—	79.7%	20.3%
Average personal leave (days per year) – females	8.93[74]	7.0*	16.6*
Marginal number of personal leave (days per year) – females	—	—	9.7

*Back-solved

APPENDIX A

Personal Leave Cost Category: Model Result

The cost associated with additional personal leave was calculated by multiplying the marginal number of personal leave days by the earnings applicable for those within the focus cohort (Tables 7 and 8).

Table 7 Cost of personal leave – males

Age range	Number employed ('000)	AWE – males with mental disorder(s) ($/week)	Cost – personal leave ($m)
12–14	0.0	0	0.0
15–19	110.8	341	69.3
20–25	177.6	782	254.5
Total	288.4	—	323.8

Table 8 Cost of personal leave – females

Age range	Number employed ('000)	AWE – females with mental disorder(s) ($/week)	Cost – personal leave ($m)
12–14	0.0	0	0.0
15–19	124.4	251	60.3
20–25	199.2	641	246.6
Total	323.6	—	306.9

2.2 Reduced Personal Income

This cost relates to reduced income levels of the cohort of young people with mental disorders who are employed. A Productivity Commission study[75] found that, on average, young men with mental disorders have 4.7% lower hourly wages relative to males without mental disorders, and young women with mental disorders have 3.1% lower hourly wages relative to females without mental disorders, controlling for factors including:

- demographic variables (e.g. age and level of education);
- employment;
- experience;
- physical health; and
- unemployment history.

By considering hourly wages, this methodology allows for the differences in unemployment and underemployment rates between people with and without mental disorders.

The number of people in the focus cohort participating in the labour force was derived by applying the general male and female population labour force participation[p] rates by age[76] to the focus cohort, as shown in Tables 9 and 10.

Table 9 Focus cohort by labour force status – males

Age range	Focus cohort ('000)	Participation rate[76]	Labour force ('000)	Non-labour force ('000)
12–14	40.0	0%	0.0	40.0
15–19	233.1	52%	120.5	112.6
20–25	247.4	78%	193.1	54.2
Total	520.6	—	313.7	206.9

[p] The proportion of young men and women who are actively participating in the workforce (participation rate) by either being employed or looking for employment (termed "unemployed").

Table 10 Focus cohort by labour force status – females

Age range	Focus cohort ('000)	Participation rate[76]	Labour force ('000)	Non-labour force ('000)
12–14	26.7	0%	0.0	26.7
15–19	245.5	56%	137.9	107.6
20–25	300.7	73%	220.9	79.9
Total	572.9	—	358.7	214.2

General population labour participation rates for specific age groups were applied to the model for the following reasons:

- The 2007 National Survey of Mental Health and Wellbeing reported that the labour participation rate for people with mental disorders (of all ages) was similar to the rate for people without mental disorders (Table 11).
- However, as there is large variation in participation rates across different age bands and there was no published age-specific participation rates for people with mental disorders, we applied general population age-specific rates for labour force participation to our model.

Table 11 Labour force participation rates[73,76]

Gender – by age	Male participation rate	Female participation rate
12–14	0%	0%
15–19	52%	56%
20–25	78%	73%
General population 15–64	82%	70%
All persons 16–85 with mental disorders	70%	
All persons 16–85 without mental disorders	67%	

The actual costs associated with lost personal income were derived using ABS average weekly earnings (AWEs). AWEs at December 2014 by age were derived based on 2013 ABS AWEs by age,[77] inflated to December 2014 using:

- ABS all age AWE inflation[78] to August 2013; and
- an assumed AWE inflation rate of 2.8% between August 2013 and December 2014.

Table 12 presents the adopted AWEs by age.

Table 12 Average weekly earnings by age as at December 2014

Age range	AWE – males, December 2014 ($/week)	AWE – females, December 2014 ($/week)
15–19	358	259
20–24	821	661
25–29	1229	951
30–34	1446	1030
35–39	1600	997
40–44	1749	1016
45–49	1694	1077
50–54	1701	987
55–59	1546	1003
60–64	1514	895
65 and over	1156	751

APPENDIX A

Reduced Personal Income Cost Category: Model Result
This reduction in earnings of the employed group within the focus cohort is shown in Tables 13 and 14.

Table 13 Cost of reduced earnings – males

Age range	Number employed ('000)	AWE – general males, 2014 ($/week)	AWE – males with mental disorders ($/week)	Cost – reduced productivity ($m)
12–14	0.0	0	0	0.0
15–19	110.8	358	341	97.1
20–25	177.6	821	782	356.3
Total	288.4	—	—	453.4

Table 14 Cost of reduced earnings – females

Age range	Number employed ('000)	AWE – general females, 2014 ($/week)	AWE – females with mental disorders ($/week)	Cost – reduced productivity ($m)
12–14	0.0	0	0	0.0
15–19	124.4	259	251	51.9
20–25	199.2	661	641	212.3
Total	323.6	—	—	264.2

2.3 Reduced Education
The 2007 National Survey of Mental Health and Wellbeing[73] identified that people with mental disorders have lower levels of education, while the Productivity Commission[75] reports that average hourly wages are correlated with education levels (after adjusting for demographic and other employment-related factors). In order to quantify the costs associated with reduced education levels among people with mental disorders, in terms of lower wages we undertook the following steps:

- *Step 1:* The employed cohort was divided into groups differentiated by age and education.
- *Step 2:* Earnings by education levels were derived.
- *Step 3:* Total yearly earnings of the cohort with educational attainment levels applicable to mentally ill and non-mentally ill people were determined. The difference in earnings represents the cost of reduced education.

Step 1: Tables 15 and 16 illustrate the employment levels within the focus cohort classified by education levels, using both mentally ill and non-mentally ill education levels. An assumption was made that the earnings growth as an individual ages is the same at all education levels.

Table 15 Education level mix by mental health status – male (ABS Survey of Mental Health)

	Education levels[73]		Number employed in focus cohort aged 15–19 ('000)		Number employed in focus cohort aged 20–25 ('000)	
Education level	**With mental disorder**	**No mental disorder**	**People with mental disorder**	**People without mental disorder**	**Mentally ill rates**	**Non-mentally ill rates**
Bachelor degree or above	16.9%	20.7%	18.8	23.0	30.1	36.8
Advanced diploma/Diploma	9.3%	8.3%	10.4	9.2	16.6	14.8
Certificate	25.6%	25.3%	28.4	28.1	45.5	45.0
No non-school qualification	48.1%	45.6%	53.3	50.6	85.4	81.0
Total	100%	100%	110.8	110.8	177.6	177.6

Table 16 Education level mix by mental health status – female (ABS Survey of Mental Health)

	Education levels[73]		Number employed in focus cohort aged 15–19 ('000)		Number employed in focus cohort aged 20–25 ('000)	
Education level	**Mental illness**	**No mental illness**	**People with mental disorder**	**People without mental disorder**	**Mentally ill rates**	**Non-mentally ill rates**
Bachelor degree or above	16.9%	20.7%	21.1	25.8	33.8	41.3
Advanced diploma/Diploma	9.3%	8.3%	11.6	10.4	18.6	16.6
Certificate	25.6%	25.3%	31.9	31.5	51.0	50.4
No non-school qualification	48.1%	45.6%	59.8	56.7	95.8	90.9
Total	100%	100%	124.4	124.4	199.2	199.2

Step 2: Earnings by education level by age were derived via three steps:

1. 2003 hourly wages by education level as published by the Productivity Commission study[75] were inflated to 31 December 2014 using general population male and female AWE inflation.
2. Hourly wages by education level were scaled to reflect the ages within our focus cohort based on the earnings relativities by age of the general population,[77] as shown in Table 17.

Table 17 General population average weekly earnings by age (full-time only)

Age range	AWE (2014 $)[77]	Relativity against all ages
15–19	635	45%
20–24	943	67%
All ages	1414	—

3. Hourly wages for general population by age and education levels were converted to male and female average weekly earnings by age and education levels, allowing for the following factors:
    - Males aged 15–19 and males aged 20–24 have 0% and 5.3% higher full-time average weekly earnings relative to the general population at the same age level, respectively.[77]
    - Females aged 15–19 and females aged 20–24 have 0.3% and 7.1% lower full-time average weekly earnings relative to the general population at the same age level, respectively.[77]
    - Average full-time hours worked per week: 41.4 for males and 38.9 for females.[79]
    - Average part-time hours worked per week: for males is 14.5 (15–19 age band), 21.5 (20–25 age band).
    - Average part-time hours worked per week: for females is 13.2 (15–19 age band), 26.7 (20–25 age band).
    - The proportions of workers working part-time, by age:
        - 54% part-time for males and 75% for females 15–19; and
        - 21% part-time for males and 40% for females 20–24.

Step 3: The resultant average weekly earnings applicable to the focus cohort by age are presented in Tables 18 and 19.

Table 18 Average weekly earnings by education level (aged 15–19)

Education level	General population earnings (inflated to 2014 $/hr)[75]	General population age 15–19 earnings (2014 $/hr)	Female age 15–19 AWE (2014 $/week)	Male age 15–19 AWE (2014 $/week)
Bachelor degree or above	41.5	14.3*	278*	386*
Advanced diploma/Diploma	31.9	14.3	278	386
Certificate	30.3	13.6	264	367
No non-school qualification	28.3	12.7	247	343
Overall	—	—	260	361

*Ages 15–19 assumed to not have a degree.

Table 19 Average weekly earnings by education level (aged 20–24)

Education level	General population earnings (inflated to 2014 $/hr)[75]	General population age 20–24 earnings (2014 $/hr)	Female age 20–24 AWE (2014 $/week)	Male age 20–24 AWE (2014 $/week)
Bachelor degree or above	41.5	27.7	868	1,081
Advanced diploma/Diploma	31.9	21.3	668	831
Certificate	30.3	20.2	634	790
No non-school qualification	28.3	18.9	593	738
Overall	—	—	665	827

Result

The difference in earnings represents the cost of reduced education for the cohort of young people with mental disorders, from reduced earnings (Tables 20 and 21).

Table 20 Cost due to reduced education – males

	Male AWE		Total yearly earnings ($m)		
	AWE 15–19	AWE 20–24	With mental disorders	Without mental disorders	Cost – reduced education levels
Bachelor degree or above	386	1081	2067.8	2529.5	461.8
Advanced diploma/Diploma	386	831	925.5	825.7	(99.8)
Certificate	367	790	2410.0	2381.9	(28.1)
No non-school qualification	343	738	4225.9	4008.2	(217.6)
Total	361	827	9629.2	9745.5	116.3

Table 21 Cost due to reduced education – females

	Female AWE		Total yearly earnings ($m)		
	AWE 15–19	AWE 20–24	With mental disorders	Without mental disorders	Cost – reduced education levels
Bachelor degree or above	278	868	1828.4	2236.7	408.3
Advanced diploma/Diploma	278	668	814.7	726.9	(87.8)
Certificate	264	634	2121.6	2096.9	(24.7)
No non-school qualification	247	593	3720.2	3528.6	(191.6)
Total	260	665	8485.0	8589.1	104.2

3. Unemployment Cost Category

This category is comprised of two costs:

- lost income while unemployed; and
- unemployment benefits paid from the government to the individual.

These costs are applied to the marginal number of people unemployed as a result of mental illness (i.e. the additional number of unemployed people in the focus cohort as a result of experiencing a mental disorder).

The approach taken to quantify these costs is as follows:

- The labour force is multiplied by the difference in unemployment rates between people with and without mental disorders to derive the marginal number of unemployed.
- For the lost income component, the number of marginal unemployed is multiplied by average weekly earnings and the average duration of unemployment.[80]
- For the unemployment benefits component, the number of marginal unemployed was multiplied by the average duration of unemployment[80] and weekly unemployment benefits.

Statistics from the 2007 National Survey of Mental Health and Wellbeing[73] were used as a basis to identify unemployment rates by mental illness status. The 2007 rates were applied to the general population unemployment rate as at 2014. This assumes that the relativities that applied in 2007 still apply to 2014.

The unemployment rate for people with mental disorders was found to be higher than the unemployment rate for people without mental disorders (Table 22).[73]

Table 22 Unemployment rate

Year	General population	With mental disorders	Without mental disorders	Relativity	Gap
2007	3.8%[76]	5.4%[76]	3.4%	1.6	2.0%
2014 (male)	5.7%	8.1%*	5.0%*	1.6	3.0%
2014 (female)	6.9%	9.8%*	6.1%*	1.6	3.7%
Proportion	—	22.2%[73]	77.8%	—	—

*Back-solved

A geometric (proportional) rather than arithmetic (fixed) mean relativity was chosen to measure the relative risk of unemployment for this cohort so that the gap is proportional to the general population unemployment rate. A geometric relativity of 1.6 means the cohort has 1.6 times more prevalence of unemployment relative to a non-mentally ill population. For example, if the unemployment rate for people without mental disorders was higher at 10%, the unemployment rate for people with mental disorders would be 16%.

Tables 23 and 24 depict the number of unemployed within the focus cohort. The number of marginally unemployed was then calculated using the gap derived above. This value represents the additional number of unemployed people in the focus cohort due to higher unemployment rates relative to a cohort without mental disorders.

Table 23 Marginal unemployment cohort – males

Age range	Focus cohort ('000)	Labour force ('000)	Unemployment rate with mental disorders	Unemployment rate without mental disorders	Marginal unemployed ('000)
12–14	40.0	0.0	—	—	0.0
15–19	233.1	120.5	8.1%	5.0%	3.6
20–25	247.4	193.1	8.1%	5.0%	5.8
Total	520.6	313.7	—	—	9.5

Table 24 Marginal unemployment cohort – females

Age range	Focus cohort ('000)	Labour force ('000)	Unemployment rate with mental disorders	Unemployment rate without mental disorders	Marginal unemployed ('000)
12–14	26.7	0.0	—	—	0.0
15–19	245.5	137.9	9.8%	6.1%	5.1
20–25	300.7	220.9	9.8%	6.1%	8.1
Total	572.9	358.7	—	—	13.2

APPENDIX A

Unemployment Cost Category: Model Result

The overall cost associated with unemployment is presented in Tables 25 and 26.

Table 25 Cost of unemployment lost income and welfare benefits – males

Age range	Marginal unemployed ('000)	Ave. weeks unemployed[80]	AWE – males ($/week)	Unemp. benefits ($/week)[81]	Unemp. lost income ($m)	Unemp. welfare benefits ($m)
12–14	0.0	0	0	113	0.0	0.0
15–19	3.6	22	358	113	28.7	9.1
20–25	5.8	35	821	211	166.8	42.8
Total	9.5	—	—	—	195.4	51.9

Table 26 Cost of unemployment lost income and welfare benefits – females

Age range	Marginal unemployed ('000)	Ave. weeks unemployed[80]	AWE – females ($/week)	Unemp. benefits ($/week)[81]	Unemp. lost income ($m)	Unemp. welfare benefits ($m)
12–14	0.0	0	0	113	0.0	0.0
15–19	5.1	21	259	113	27.4	12.0
20–25	8.1	32	661	211	172.6	55.1
Total	13.2	—	—	—	200.0	67.1

4. Imprisonment Cost Category

The 2007 National Survey of Mental Health and Wellbeing[73] shows that people with mental illness experience higher imprisonment rates relative to people without mental illness. The model quantified the costs associated with imprisonment by considering:

- the lost income of the individual during the period of imprisonment; and
- the direct cost of imprisonment (operational costs).

These costs were applied to the marginal number imprisoned – that is, the additional number of imprisoned people in the focus cohort due to higher imprisonment rates.

The 2007 National Survey of Mental Health and Wellbeing[73] reports that 5% of all people with mental disorders have ever been incarcerated in their lifetime, relative to 1.8% of people without mental disorders. This reflects a relativity of 2.8 times.

This relativity, together with the proportion of the general population that are experiencing mental disorders,[q] was applied to the general population male and female imprisonment rates to calculate the imprisonment rates applicable to the cohort of those with mental disorders. These calculations are shown in Tables 27 and 28.

[q] Estimated at 30% for females, 23% for males (ABS National Survey of Mental Health and Wellbeing, 2007).

Table 27 Imprisonment rates by age – males

Age range	General population male imprisonment rates[82]	Imprisonment rate in those with mental disorders	Imprisonment rate in those without mental disorders
<18	0.031%	0.061%	0.022%
18	0.186%	0.369%	0.132%
19	0.328%	0.651%	0.232%
20–25	0.520%	1.033%	0.369%

Table 28 Imprisonment rates by age – females

Age range	General population male imprisonment rates[82]	Imprisonment rate in those with mental disorders	Imprisonment rate in those without mental disorders
<18	0.000%	0.000%	0.000%
18	0.013%	0.024%	0.008%
19	0.019%	0.034%	0.012%
20–25	0.039%	0.070%	0.025%

Similar to the unemployment costs calculated in the previous section, a geometric (proportional) rather than arithmetic (fixed) relativity was chosen to measure the relative risk of this cohort so that the gap is proportional to the general population imprisonment rate.

The marginal number of people imprisoned relates to the additional number of imprisoned people in the focus cohort due to higher imprisonment rates. This was calculated as the difference in imprisonment rates between those with and without mental disorders cohorts multiplied by the number of people in the focus cohort (see Tables 29 and 30).

Table 29 Marginal number of focus cohort imprisoned – males

Age range	Focus cohort ('000)	Imprisonment rate in those with mental disorders	Imprisonment rate in those without mental disorders	Number imprisoned ('000)	Marginal number imprisoned ('000)
<18	178.1	0.061%	0.022%	0.11	0.07
18	47.2	0.369%	0.132%	0.17	0.11
19	47.9	0.651%	0.232%	0.31	0.20
20–25	247.4	1.033%	0.369%	2.55	1.64
Total	520.6	—	—	3.15	2.02

Table 30 Marginal number of focus cohort imprisoned – females

Age range	Focus cohort ('000)	Imprisonment rate in those with mental disorders	Imprisonment rate in those without mental disorders	Number imprisoned ('000)	Marginal number imprisoned ('000)
<18	171.8	0.000%	0.000%	0.00	0.00
18	49.8	0.024%	0.008%	0.01	0.01
19	50.6	0.034%	0.012%	0.02	0.01
20–25	300.7	0.070%	0.025%	0.21	0.14
Total	572.9	—	—	0.24	0.15

APPENDIX A

4.1 Direct Costs

Direct costs relate to the operational costs associated with running a prison. According to a Corrective Services report on government services,[83] the total cost per prisoner (comprising net operating expenditure, depreciation, debt servicing fees and user cost of capital) was $275 per day, or $100,400 per year. This 2009–10 cost was inflated to December 2014 using CPI inflation[72] to arrive at a sum of $113,333.

The health costs of caring for prisoners with mental disorders have not been included in the current study due to the lack of available data.

Using ABS data,[82] the average prison duration was then calculated by taking the weighted average by type of crime using the mix of prisoners by age and by sentence type, and the average expected time to serve. It was assumed that the length of prison sentences received by the cohort with mental disorders is the same as the general population.

The resulting average duration of imprisonment for all ages was greater than 1 year, but the direct cost of imprisonment was capped at 1 year for the model (as the intention is to calculate yearly costs).[r]

Imprisonment Cost Category (Direct Costs): Model Result

Table 31 Imprisonment direct costs – males

Age range	Marginal number imprisoned ('000)	Direct imprisonment cost ($m)
<18	0.07	7.9
18	0.11	12.7
19	0.20	22.7
20–25	1.64	186.1
Total	2.02	229.5

Table 32 Imprisonment direct costs – females

Age range	Marginal number imprisoned ('000)	Direct imprisonment cost ($m)
<18	0.00	0.0
18	0.01	0.9
19	0.01	1.3
20–25	0.14	15.4
Total	0.15	17.5

[r] The average duration of imprisonment is greater than 1 year for all age groups.

4.2 Lost Income

"Lost income" refers to the potential wages that would have otherwise been earned had the individual not been imprisoned. This was calculated by applying general population male and female earnings to the marginal number of the focus cohort imprisoned, adjusting for the participation and employed rate.

Imprisonment Cost Category (Lost Income): Model Result

Table 33 Imprisonment lost income – males

Age range	Marginal number imprisoned ('000)	AWE ($/week)	Participation rate[76]	General population employment rate[84]	Imprisonment lost income ($m)
<18	0.07	0	0%	—	0.0
18	0.11	358	52%	95.0%	1.0
19	0.20	358	52%	95.0%	1.8
20–25	1.64	821	78%	95.0%	52.0
Total	2.02	—	—	—	54.8

Table 34 Imprisonment lost income – females

Age range	Marginal number imprisoned ('000)	AWE ($/week)	Participation rate[76]	General population employment rate[84]	Imprisonment lost income ($m)
<18	0.00	0	0%	—	0.0
18	0.01	259	56%	93.9%	0.1
19	0.01	259	56%	93.9%	0.1
20–25	0.14	661	73%	93.9%	3.2
Total	0.15	—	—	—	3.4

5. Disability Cost Category

5.1 Welfare Benefits

Welfare payments are often excluded in cost estimates from a societal perspective since they represent a transfer of income rather than an opportunity cost of resources. However, from a more limited government economic perspective, transfer payments do have an opportunity cost and are of interest to the discussion of the impact of mental illness on the Australian economy.

According to the 2007 National Survey of Mental Health and Wellbeing,[73] people with mental disorders have significantly higher disability rates and are entitled to receive disability welfare payments. The costs associated with disability welfare payments due to mental illness were quantified using the following steps:

- *Step 1:* Determine the marginal number of disabled people with mental disorders.
- *Step 2:* Categorise by disability severity.
- *Step 3:* Apply relevant Centrelink welfare rates.

APPENDIX A

Step 1: The marginal number of disabled was calculated by applying the difference in mentally ill and non-mentally ill disability rates to the focus cohort (Tables 35 and 36). This represents the additional number of disabled people in the focus.

Table 35 Male disability status by mental disorder status

	% of Males[73]				
Disability status	**All males**	**With mental disorders**	**Without mental disorders**	**Number in focus cohort**	**Marginal number in cohort ('000)**
Profound/Severe	2.4%	5.1%	1.8%	26.5	16.9
Moderate/Mild	6.1%	9.6%	5.4%	50.0	21.8
Schooling/Employment restriction only	5.6%	13.4%	3.9%	69.7	49.2
No disability/No specific limitations or restrictions	85.8%	71.9%	88.8%	374.4	—
Total	—	—	—	520.6	87.9

Table 36 Female disability status by mental disorder status

	% of Females[73]				
Disability status	**All females**	**With mental disorders**	**Without mental disorders**	**Number in focus cohort**	**Marginal number in cohort ('000)**
Profound/Severe	3.6%	7.5%	2.5%	43.2	29.1
Moderate/Mild	7.3%	11.7%	6.0%	67.3	33.0
Schooling/ Employment restriction only	5.5%	11.1%	3.9%	63.8	41.2
No disability/No specific limitations or restrictions	83.6%	69.6%	87.6%	398.7	—
Total	—	—	—	572.9	103.3

Step 2: The marginal number of disabled in each disability severity category was then split into age bands reflecting the eligibility criteria and payment rates published by Centrelink. It was assumed all disability categories have the same age mix.

Table 37 Marginal number of disabled by age – male

		Marginal number of disabled ('000)		
Age range	**Number focus cohort ('000)**	**Profound/Severe**	**Moderate/Mild**	**Schooling/Employment restriction only**
<16	85.5	2.8	3.6	8.1
16–18	92.6	3.0	3.9	8.7
18–20	143.3	4.7	6.0	13.5
>20	199.2	6.5	8.3	18.8
Total	520.6	16.9	21.8	49.2

Table 38 Marginal number of disabled by age – female

		Marginal number of disabled ('000)		
Age range	**Number focus cohort ('000)**	**Profound/Severe**	**Moderate/Mild**	**Schooling/Employment restriction only**
<16	74.3	3.8	4.3	5.3
16–18	97.4	4.9	5.6	7.0
18–20	158.8	8.1	9.2	11.4
>20	242.4	12.3	14.0	17.4
Total	572.9	29.1	33.0	41.2

Step 3: Centrelink disability payment rates[s] were applied to the marginal number of disabled. The following parameters were chosen:

- The profoundly disabled qualify for Centrelink's maximum rate.
- The moderately disabled qualifies for 40% of the rate.
- The schooling/employment restriction only category qualifies for 12.5% of the rate.

These parameters were estimates that were chosen to calibrate modelled disability costs on working age claimants with actual government expenditure on the disability support pension in 2014.

Table 39 Centrelink Disability Support Pension and Youth Disability Supplement rates (2014)

		Maximum rate per year ($)		
Age range	**Maximum rate ($/fortnight)***	**Profound/Severe**	**Moderate/ Mild**	**Schooling/Employment restriction only**
<16	118.2	3,073	1,229	384
16–18	438.8	11,409	4,564	1,426
18–20	461.8	12,007	4,803	1,501
>20	776.7	20,194	8,078	2,524

*Centrelink maximum rates, averaged between the at home and independent rates.

Disability Cost Category: Model Result

Table 40 Disability welfare payments – males

	Annual cost ($m)			
Age range	**Profound/Severe**	**Moderate/Mild**	**Schooling/Employment restriction only**	**Total**
<16	8.5	4.4	3.1	16.0
16–18	34.4	17.7	12.5	64.6
18–20	55.9	28.8	20.3	105.1
>20	130.8	67.4	47.5	245.7
Total	229.7	118.4	83.4	431.4

[s] Maximum rates were extracted from the Youth Disability Supplement (for claimants under 16) and the Disability Support Pension (for claimants 16 or older).

Table 41 Disability welfare payments – females

	Annual cost ($m)			
Age range	**Profound/Severe**	**Moderate/Mild**	**Schooling/Employment restriction only**	**Total**
<16	11.6	5.3	2.1	18.9
16–18	56.5	25.6	10.0	92.1
18–20	96.8	44.0	17.1	157.9
>20	248.6	112.9	44.0	405.4
Total	413.4	187.7	73.1	674.3

6. Mortality Cost Category

A major aspect of the human capital approach is the lifetime stream of costs attributable to premature mortality, normally presented as the stream of lost income. In addition, there are potential cost-offsets associated with premature mortality, such as future health-care costs avoided. These costs, however, were not included in the model.

The Access Economics study[71] reported that mortality rates for young men and women with mental disorders were significantly higher than for those without mental disorders. The average cost per death was calculated by taking the net present value of all future earnings from the age at death to the retirement age (65), and offsetting this by pension costs.

The net present value approach is a process where future cash flows are discounted to the current time to account for the time value of money. The following assumptions were made:

- General population male average weekly earnings by age were averaged to derive earnings for each 5-year age band.
- For each age group (12–14, 15–19, 20–25), average age at death was the midpoint of the age band.
- Current life expectancy is 79.9 and 84.3 years for males and females, respectively.[85]

Mortality Cost Category (Lost Income): Model Result
This cost was applied to the number of people in the focus cohort that are expected to die annually due to mental disorder(s)-related mortality, as summarised in Tables 42 and 43.

Table 42 Mortality cost – males

Age range	Focus cohort ('000)	Mortality rate due to mental disorder(s)[71]	Marginal deaths	Average cost/ death ($m)	Annual mortality cost ($m)
12–14	40.0	0.01%	4	2.8	11.1
15–19	233.1	0.08%	187	2.9	538.8
20–25	247.4	0.09%	223	2.9	635.8
Total	520.6	—	413	—	1185.7

Table 43 Mortality cost – females

Age range	Focus cohort ('000)	Mortality rate due to mental disorder(s)[71]	Marginal deaths	Average cost/ death ($m)	Annual mortality cost ($m)
12–14	26.7	0.02%	5	1.7	9.1
15–19	245.5	0.04%	98	1.8	173.6
20–25	300.7	0.03%	90	1.7	154.3
Total	572.9	—	194	—	337.0

Appendix B Methodology: Scenario 1

In order to compare the delay to treatment in scaling up face-to-face and online mental health services, along with the recurrent costs to government of increasing scale, we assumed the following:

- Six years are needed to train a mental health professional who can provide services funded through the Better Access Initiative.
- The cost to government of training a mental health professional was based on the requirements to train a clinical psychologist, which was assumed to include a four-year undergraduate degree (based on costs associated with Funding Cluster 3, Behavioural Science, with a per annum government contribution of $9,637) and two years of postgraduate study (based on costs associated with Funding Cluster 5, Clinical Psychology, with a per annum government contribution of $11,852). Costs are based on 2015 government contribution estimates.
- There are no capacity constraints in terms of how many mental health professionals can be in training.
- A one-year build time is needed for an online mental health app.

A low-complexity app costs approximately $150,000 to build, a medium-complexity app costs approximately $220,000 and a high-complexity app costs approximately $290,000. Differences in complexities of app types are based on inclusion/exclusion of the following features and functionality:

Indicative features and functionality for a low-cost app:

- Look and feel has little or no custom graphics, animation or sound.
- Simple logic with minimal steps (linear structure).
- Basic analytics.
- Generally excludes features such as push notifications, geo location, content and program updates.

Indicative features and functionality of a high-cost app:

May use features listed above (under low-cost app), plus:

- Look and feel may include custom graphics, animation, videos, sound effects and music. May also use characters or avatars.
- Frequent content updates.
- Integrated login.
- Cloud saving/backup.
- Integration into other sites (e.g. Google and Facebook).
- Integration with third-party devices such as fitness trackers.
- Customised logic with complex algorithms with exceptions to the rules.
- Forms.
- Custom analytics.
- Interactive elements.
- Tagged or flagged content.
- Personalisation.
- Meets full accessibility compliance standards.
- Multilingual.
- Search functionality.
- Content categorisation/filters.
- Progress indicators.
- Data export features.
- Email/print features.

App maintenance costs are estimated at approximately one-third of the total build cost per annum.

Appendix C
Methodology: Scenario 2

The prevention program used in this scenario included a school-based screening program aimed at identifying and administering CBT to young people aged 11–17 with subclinical symptoms of depression. Mihalopoulos and colleagues explain that this scenario was developed with reference to the basic components of indicated preventive interventions described in published systematic and meta-analytic reviews.[86] However, instead of having teachers and psychologists administer the program, we explore the potential cost-effectiveness of providing this type of intervention online. We assumed equal effectiveness in reducing the incidence of depression for both approaches, and used the same population parameters as Mihalopoulos and colleagues did in their economic model.

In the model proposed by Mihalopoulos and colleagues (2012):

- The effectiveness of the preventive intervention was captured using Disability Adjusted Life Years (DALYs) averted, where a DALY represents "the sum of years of potential life lost due to premature mortality and the years of productive life lost due to disability" (World Health Organization, 2015).
- The Incremental Cost Effectiveness Ratio (ICER) was used to compare the relative costs and effectiveness of a face-to-face screening and intervention program and a "doing nothing" approach.
- A $50,000 per DALY threshold was adopted, where an ICER less than $50,000 reflects good value for money, while an ICER greater than $50,000 reflects poor value for money.

We further extended our model to conduct a sensitivity analysis on the build and maintenance costs associated with an online screening and prevention intervention. The results of this analysis (presented in the table below) indicated that, even with a substantial increase in both the cost of the online build and annual maintenance costs, the ICERs (with and without cost offsets) remain very favourable in terms of value for money thresholds.

	Low-cost build ($600,00)		**High-cost build ($900,000)**	
	Low-cost maintenance ($100,000 per annum)	**High-cost maintenance ($180,000 per annum)**	**Low-cost maintenance ($100,000 per annum)**	**High-cost maintenance ($180,000 per annum)**
DALYs averted	5600	5600	5600	5600
Costs of intervention	$1.1 million	$1.5 million	$1.4 million	$1.8 million
Cost offsets	$16 million	$16 million	$16 million	$16 million
Total costs	–$14.9 million	–$14.5 million	–$14.6 million	–$14.2 million
ICER (with cost offsets)	–$2661	–$2589	–$2607	–$2536
ICER (without cost offsets)	$196	$268	$250	$321

Appendix D
Methodology: Scenario 3

Methodology: Treatment Scenario

In Scenario 3 we explored the potential cost avoidance resulting from an increase in the rate of help-seeking and the subsequent provision of online treatment to young people who are currently experiencing depression and/or anxiety but who are not accessing any mental health services. This section describes our methodology on quantifying the associated cost avoidance.

The number of young people successfully treated for depression and/or anxiety using online interventions was derived as follows:

1. We calculated the number of people who are currently experiencing depression and/or anxiety by age, using the latest available prevalence and population estimates.
2. This cohort (people with depression/anxiety disorders) was split into two categories:
    a. those already receiving treatment; and
    b. those not receiving treatment.
3. We then estimated how many of those not currently receiving treatment would access and benefit from online interventions based on the following assumptions:
    a. Treatment rates would double, in accordance with help-seeking goals outlined by the National Mental Health Commission.
    b. Treatment would be effective in achieving recovery for 42.4% of those who access online treatment.

Costs avoided were estimated over a one-year period.

The values and sources for each parameter in our model are outlined in Table 1.

APPENDIX D

Table 1 Parameters used in the treatment case study – young people aged 13–25 years

Parameter	Values	Source
Number of young people aged 13–25 in Australia in 2014	13-year-olds: 145,098 male, 137,570 female 14-year-olds: 144,899 male, 138,443 female 15-year-olds: 145,929 male, 139,041 female 16-year-olds: 147,147 male, 139,281 female 17-year-olds: 149,742 male, 142,423 female 18-year-olds: 153,913 male, 144,702 female 19-year-olds: 161,523 male, 151,442 female 20-year-olds: 161,817 male, 152,388 female 21-year-olds: 163,227 male, 154,925 female 22-year-olds: 166,684 male, 159,124 female 23-year-olds: 173,852 male, 167,430 female 24-year-olds: 179,827 male, 172,953 female 25-year-olds: 176,572 male, 171,287 female	ABS (2014), Australian Demographic Statistics[87]
Percentage of young people who currently have affective and/or anxiety disorders	Percentage of males aged 16–24 with anxiety and/or affective disorders: 12.8% Percentage of females aged 16–24 with anxiety and/or affective disorders: 26.5% Percentage of males aged 13–15 with depressive disorders*: 4.8% Percentage of females aged 13–15 with depressive disorders*: 4.9%	2007 National Survey of Mental Health and Wellbeing ABS CURF (unpublished data)[88] 1997 National Survey of Mental Health and Wellbeing – child component (Sawyer et al. 2000)[89]
Percentage of young people who currently have affective and/or anxiety disorders who have not accessed any mental health services in past 12-months (i.e. "untreated cases")	Percentage of young males 16–24 with anxiety and/or affective disorders who have not accessed any mental health services in the last 12 months: 77.0% Percentage of young females 16–24 with anxiety and/or affective disorders who have not accessed any mental health services in the last 12 months: 62.2% Percentage of young people (males and females) 13–15 years with a mental disorder who have not attended at least one service: 71%	2007 National Survey of Mental Health and Wellbeing ABS CURF (unpublished data)[90] 1997 National Survey of Mental Health and Wellbeing – child component (Sawyer et al. 2000)[91]
Proportion of young people who receive online treatment	Percentage of young males 16–24 with an anxiety and/or affective disorder who access online treatment: 46% (doubled from 23%) Percentage of young females 16–24 with an anxiety and/or affective disorder who access online treatment: 75.6% (doubled from 37.8%) Percentage of young people (males and females) 13–15 with a mental disorder who access online treatment: 58% (doubled from 29%)	Based on the Mental Health 2012 and 2013 Report Cards, which call for a doubling in the numbers of people who access "timely and appropriate mental health services and support".

Parameter	Values	Source
Proportion of those who start and complete treatment	65%	Based on a review by Ballegooijen, Cuijpers, van Straten, Karyotaki, Andersson, Smit and Riper et al. (2014)[92] who report attrition rates of approximately 35%.
Proportion of those receiving treatment (who didn't drop out) who recover	42.4%	Median treatment efficacy based on 12 studies that published figures on the number/ percentage of people who went from meeting criteria for a diagnosis of anxiety and/or depression pre-treatment to not meeting criteria for a diagnosis of the disorder post-online treatment.[93,94,95,96,97,98,99,100,101,102,103,104]

* Prevalence estimates for 13–15-year-olds are for depression only, as these values were derived from the child-component of the 1997 National Survey of Mental Health Wellbeing which does not include prevalence estimates of anxiety.

Cost Avoidance

This scenario requires a cost of mental illness per person to be applied to the numbers of people assumed to have recovered from depression and/or anxiety disorders as a result of online treatment.

In the original *Counting the Cost* report the negative impact of mental disorder on educational attainment, days out of role and level of disability were based on findings for people experiencing affective disorders (depression, bipolar and dysthymia), anxiety disorders and/or substance abuse disorders as specified in the National Survey of Mental Health and Wellbeing.[105] However, for our scenario we were interested in depression and anxiety only. Access Economics[106] estimated the disability-adjusted weights associated with five mental disorders classified as follows: substance use, anxiety and depression, schizophrenia, bipolar, and other mental disorders. The disability weights associated with depression and anxiety, for both males and females, were higher than those associated with substance use or bipolar disorder. Therefore, using our estimates (from the original *Counting the Cost* model) of the negative impact of mental disorder on educational attainment, days out of role and level of disability are likely to be conservative when considering depression and anxiety alone. Furthermore, we also applied parameter estimates in the original model for health service utilisation and reduced income. Mortality rates were based on suicides that could be attributed to depression and/or anxiety. Begg and colleagues, as cited by Access Economics,[107] found that anxiety and depression accounted for approximately 48% of suicides that could be attributed to a mental disorder. Only mortality costs (lost income) for the first year were included as a result of suicide.

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