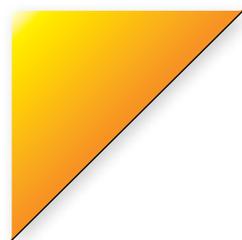


The economic case for investing in mental health prevention Summary



Australian Government
National Mental Health Commission



Introduction

Mental health is a key part of an individual's capacity to lead a contributing life, which includes the ability to form relationships, study, and work, as well as participating in the community and making decisions day to day.

Ensuring that Australians enjoy good mental health over their lifetime depends on investing early in the right kinds of evidence based interventions. By prioritising funding in prevention, and timely interventions when people are at risk, we can pave the way for better outcomes from childhood through to older age.

This project looks at the potential benefits of ten specific interventions, both in terms of improved mental health, and their impact on the Australian economy, through levels of improved productivity and health system cost savings.

The most recent comprehensive data available indicates that, in 2016–17, the national recurrent expenditure on mental health–related services was around \$9.1 billion.¹ Every year, around 8 million working days are lost due to mental illness.² Poor mental health also has economic consequences beyond healthcare, with other costs incurred such as in the areas of justice, aged care, housing and education.

It is estimated that close to half (45.5%) of the Australian population between 16 and 85 years of age will experience a common mental illness, such as an anxiety, affective or substance use disorder, at some stage in their lifetime. It is also estimated that 20% of the population experience a common mental illness each year. Of these, anxiety disorders (such as social phobia) are the most prevalent, affecting 1 in 7 (14.4%) people, followed by affective disorders (such as depression) (6.2%), and substance use disorders (such as alcohol dependence) (5.1%).³ It is clear therefore, that all levels of government have a vested interest in both the social and economic costs of mental illness.

Work completed by KPMG and Mental Health Australia⁴ in 2018 estimated \$90 million in savings would be available in the short term if targeted investment in prevention and early intervention was increased, highlighting the significant economic gains that could be made.

Following on from this work, the National Mental Health Commission (NMHC) funded Deakin Health Economics to build the evidence base for specific interventions using economic modelling. The objective is to assist policy makers, funders, commissioning bodies and other organisations to make informed choices about the best use of resources to prevent mental illness in our community.

The ten interventions modelled in this project include:

- Two interventions delivered via the workplace to promote good mental health and prevent depression.
- Two interventions (one physical, one psychological) for prevention of post-natal depression.
- Two psychological interventions in school settings for the prevention of bullying and depression in children.
- One parenting intervention for the prevention of anxiety disorders in children.
- One e-Health intervention for prevention of anxiety disorders in young people.
- Two interventions (one e-Health, one educational) to reduce older person's loneliness.

Methodology

The interventions were selected from an initial scoping study which provided parameters around interventions that had good clinical evidence of effectiveness. If an intervention had not been tested and evaluated under controlled conditions then it was not considered for further modelling. The interventions were selected by applying criteria determined by stakeholder attendees at a NMHC hosted workshop in March 2018. The criteria applied to the interventions included:



Scalability – to what extent can an intervention be realistically rolled out across all population groups who would benefit, and feasibility of maintaining program quality and fidelity at scale?



Sustainability – what is the financial cost of scaling up, and what is the longevity of outcomes likely to be beyond the interventions?



Opportunity Costs – what are the trade-offs, including workforce demands and redirection of resources from other programs and/or policies?



Needs Based – with a focus on potential ‘burden of disease’, noting the priority is prevention of mental illness.



Acceptability – what is the likelihood that individuals in the target population will accept the intervention, and what is the likelihood of generating ‘buy in’ from policy decision makers?



Unanticipated Consequences – both positive and negative including accrual of downstream benefits and those across different sectors.

The ten interventions selected were then modelled using a return on investment (ROI) framework. The modelling by Deakin Health Economics was overseen by a steering committee of stakeholders which included representatives from academia, government, community managed organisations, and people with lived experience.

The modelling included an assessment of cost effectiveness using a ROI ratio and costs saved based on cases of mental illness prevented. The ROI ratio calculates gain or loss in relation to the initial investment of funding. A ROI ratio which is greater than \$1 means that the cost savings are greater than the costs of the intervention. For example, a ROI of \$1.50 means that for every \$1 invested, \$1.50 will be returned to the economy.

Each intervention was then assessed in terms of the implementation issues pertinent for decision makers to consider when deciding whether to invest in an intervention. Additional criteria were applied to each of the interventions including: potential secondary effects, equity, strength of evidence, acceptability, feasibility and sustainability. These criteria were then judged in terms of their impact on the case for investment, with a 'positive' implying that the secondary filter strengthens the case for investment, 'uncertain' reduces certainty for investing in the intervention, and 'negative' means that investment in the intervention is not supported.

Results of the modelling

Overall the modelling shows that there is good evidence for investing in a range of preventative interventions, both on the grounds of cost effectiveness and cost savings. These include less demand on the health budget through use of mental health services (such as less hospitalisation and use of community based services), as well as increased productivity (via less absenteeism and presenteeism in the workplace). However, it should be noted that results achieved under ideal conditions, i.e. small scale randomised control trials, may not always be replicated when implemented on a large scale, in real world settings. For this reason, further trials and evaluation should be an integral part of any implementation plan and funding should be earmarked for this purpose prior to any large scale roll out of an intervention.

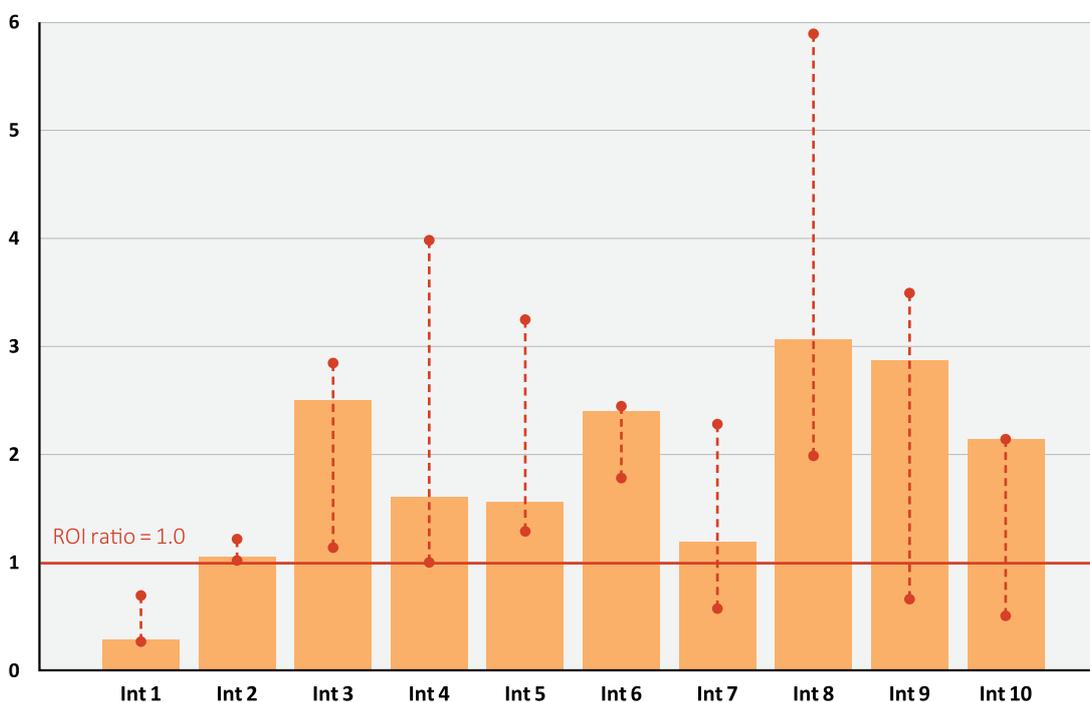
Table 1, below, provides further details on all of the interventions modelled. The interventions have been listed in order of largest ROI to smallest. This represents one particular lens for assessment of value, further considerations related to how these interventions can be implemented are discussed below.

Table 1: Results of interventions ranked by ROI with total costs and total savings

ROI	Intervention	Target population	Length of costs and benefits	Total costs of intervention	Total savings
3.06	e-Health interventions for the prevention of anxiety disorders in young people	School students aged 11–17 years	10 years	\$6.2M	\$18.8M
2.87	Educational interventions to reduce older persons' loneliness	Women aged 55 years and above residing in the community	5 years	\$25.2M	\$72.4M
2.54	Exercise programs for the prevention of post-natal depression	Women at least 4 weeks post birth	5 years	\$5.5M	\$14.0M
2.40	Parenting interventions for the prevention of anxiety disorders in children	Preschool children aged 4–5 years	3 years	\$3.7M	\$8.3M
2.14	e-Health interventions to reduce older persons' loneliness	Lonely older adults aged 65 and above enrolled into the Community Visitors Scheme	5 years	\$2.2M	\$4.7M
1.63	Psychological interventions for the prevention of post-natal depression	Pregnant women	5 years	\$14.6M	\$23.3M
1.56	School based interventions for bullying prevention	School students aged 8-11 years	10 years	\$66.8M	\$103.9M
1.19	School based psychological interventions to prevent depression in young people	School students aged 11-17 years	10 years	\$31.1M	\$37.1M
1.05	e-Health workplace intervention for the prevention of depression	Employees aged over 18 years	11 years	\$6.2M	\$6.5M
0.28	Face to face psychological workplace interventions for depression prevention	Employees aged over 18 years	11 years	\$166.6M	\$45.8M

The below graph (Figure 1) shows the ROI ratios across the interventions modelled. The dotted lines represent the range of ROI ratios across the different scenarios modelled for each intervention. Figure 1 shows that almost all of the interventions evaluated had positive ROI ratios with the exception of Intervention 1 – Face to Face Psychological Workplace Interventions for Depression Prevention. While Cognitive Behavioural Therapy offered to all staff, delivered by trained employees is effective for depression prevention, the costs of this intervention were not offset by improvements in employee productivity. However, given there are health gains associated with the intervention, it may still be considered a worthwhile investment in the context of employee health and wellbeing, over and above productivity impacts alone.

Figure 1: ROI ratio range across best and worst case alternative scenarios for each intervention



Note: The dotted lines presented above denote the range of return on investment (ROI) ratios that occur across the best- and worst-case alternative scenarios that were modelled for each intervention. For some interventions, the best- or worst-case alternative scenario overlapped with the base case scenario.

Interventions: Int 1 – Face to face psychological workplace interventions for depression prevention; Int 2 – e-Health psychological workplace interventions for the prevention of depression; Int 3 – Exercise programs for prevention of post-natal depression; Int 4 – Psychological interventions for the prevention of post-natal depression; Int 5 – School based interventions for bullying prevention; Int 6 – Parenting interventions for prevention of anxiety disorders in children; Int 7 – School based psychological interventions to prevent depression in young people; Int 8 – e-Health interventions for the prevention of anxiety disorders in young people; Int 9 – Educational interventions to reduce older persons’ loneliness; Int 10 – e-Health interventions to reduce older persons’ loneliness

Limitations

This project evaluates a small number of possible preventative interventions for mental health. It does not evaluate all the potential mental health prevention interventions that could be delivered.

The scope of this project does not include interventions which are targeted to the needs of specific populations including Aboriginal and Torres Strait Islander people and people from Culturally and Linguistically Diverse backgrounds. This was due to the absence of evidence in the literature (as examined in the initial scoping study) for interventions targeted to these populations. In most cases, the modelling did not take into account the costs and benefits accrued by individuals caring for someone with a mental illness.

To calculate the ROI ratio for each intervention, assumptions are made about how the intervention is implemented. For example, each model assumes a sufficient workforce is available and existing infrastructure is in place to deliver the intervention. These assumptions might be optimistic or conservative and can influence the results of the modelling, the ROI calculated, and how the results are interpreted.

There may also be different ways of implementing the intervention in the real world that may not be captured in the modelling. This means that there are limitations on the applicability of the recommendations in different settings. For example, the Face to Face Psychological Workplace Interventions for Depression Prevention is modelled in businesses with more than 200 employees because this intervention has not been tested in smaller sized businesses.

Like any single measure, ROI has limitations, and the ultimate impact of an intervention will ultimately depend on the prevalence of the problem it is trying to address. For example, a highly prevalent problem with a moderate ROI may generate greater returns than an intervention with a high ROI applied to a relatively uncommon disorder.

Take home message

This project shows that investing in prevention and early intervention makes good economic sense because it can improve Australia's productivity and result in savings to the health system. The economic modelling is designed to encourage discussion amongst decision makers (such as government and employers) and funders on future investment in mental health.

The work does not provide recommendations for or against investment in the different types of interventions considered. Instead, the project should be used to inform decision makers about the types of investment that could deliver better mental health outcomes in a cost effective manner.

It should be noted that results of the modelling are based on ideal conditions i.e. small scale randomised control trials, which may not always be replicated when implemented in large scale, real world settings. For this reason, further trials and evaluation should be an integral part of any implementation plan and funding should be earmarked for this purpose prior to any larger scale roll out of the interventions.

While specific programs were used to underpin the modelling for many of the interventions, there are in many cases similar but alternative programs and/or different ways to implement programs that may reduce the intervention cost e.g. the range of anti-bullying resources available for schools on the Student Wellbeing Hub website (<https://studentwellbeinghub.edu.au/>). Alternatively, costs may increase but result in better targeting of the intervention. Examples of implementation issues to consider include:

- Interpersonal therapy for the prevention of post-natal depression represents good value for money under a number of different scenarios. Whilst the ROI for delivery of the intervention by maternal health nurses is lower, implementing the intervention in this way may be more beneficial because nurses can better target disadvantaged groups, and provide continuity of physical and mental healthcare.
- e-Health interventions for the prevention of anxiety disorders in young people may be considered highly feasible given the minimal training and supervision requirements, but benefits will only be gained with extensive uptake of the intervention across a large number of schools. This in turn will be influenced by voluntary roll out versus integration in the broader school curriculum, and the acceptability of the intervention to teaching staff.

A number of interventions identified areas of future research including:

- How to implement interventions for employees in non traditional workplaces and patterns e.g. shift work or fly in/fly out arrangements.
- Evaluation of the effectiveness and cost effectiveness of other bullying prevention programs beyond that modelled here, and consideration of how best to ensure uptake, ongoing commitment and buy in from the school community.
- The long terms outcomes/effects of parenting programs on anxiety prevention in children.
- Additional trials to increase physical activity in women for the prevention of post-natal depression given that exercise delivers both physical and mental health benefits and the negative impacts post-natal depression can have across two generations during critical life stages. It is recommended that a well designed pilot be conducted with a view to large scale roll out.
- Measurement of loneliness and the impacts of interventions on other related concepts, such as social exclusion.

Finally, looking at investment in mental health from an economic point of view is just one lens through which decision makers should consider the value in investing in prevention in mental health. There are other considerations that go beyond the economic rationale which may influence decision makers. These considerations include the acceptability of the intervention for the target population, sustainability of the intervention in the long term and the impacts on people around the person receiving the intervention e.g. family, carers, and co-workers. These considerations are important for decision makers to assess when weighing up whether to implement an intervention.

The interventions and results of the modelling, including recommendations are described below.

Intervention 1

Face to face psychological workplace interventions for depression prevention	
Target population	Employees in large sized businesses (over 200 employees) with permanent or fixed term contracts. This is a universal intervention, offered to all employees, not just those who may be showing signs of depression or stress.
Intervention	This intervention is a Cognitive Behavioural Therapy (CBT) intervention designed as a stress management program that addresses the needs of individual employees as well as providing strategies focusing on workplace stressors. The intervention is delivered in groups of 5 to 20 employees over three to four half day workshops in the course of one or two weeks.
Evidence	The scientific evidence that was evaluated for this intervention found that up to one year after the intervention was delivered to employees, the risk of developing depression was reduced by 9% compared to no intervention.
Findings	Providing CBT to all eligible employees prevented 4,375 depression cases and resulted in a total of 1.6 million depression free days over 11 years, with a ROI of 0.28. Putting the intervention cost together with cost saving in relation to depression cases prevented, the costs were estimated to be \$27,334 for every depression case prevented. The total costs of providing the intervention, including the training of staff and the delivery of the intervention to employees, was approximately \$166M. This intervention resulted in total cost savings of \$46M to employers, based on reductions in: absences from work, staff not fully functioning at work and staff turnover.
Recommendations	<p>CBT offered in the workplace to all staff, delivered by trained employees is an effective depression prevention intervention. However, the costs of this intervention cannot be offset by the improvements in employee productivity. Given there are health gains associated with the intervention, it may still be considered as a worthwhile investment in the context of promoting employee health and wellbeing, over and above productivity impacts alone.</p> <p>Whether the intervention is scalable (or effective) in smaller businesses remains unclear given that it is likely to be more burdensome on smaller organisations that do not have the resources to undertake the necessary training in house, although external expertise may be contracted in. The interventions modelled in these studies were trialled in a workplace environment and should not be implemented in isolation. Such interventions should complement employers' consideration of current occupational health and safety obligations.</p> <p>Furthermore, results from this modelling are based on assumptions that may not fully capture implementation issues that may occur in practice. This includes managing participation of employees who have non-traditional work patterns e.g. shift work or fly in/fly out arrangements. Further research and planning of how implementation is handled in practice is needed.</p>

Intervention 2

e-Health psychological workplace interventions for prevention of depression	
Target population	Employees in large sized businesses (over 200 employees) with permanent or fixed term contracts. This is a targeted intervention offered to employees who, through screening, are found to be at risk of developing a mental illness.
Intervention	This intervention is a guided psychological stress management intervention (known as eSMI) delivered via either the internet or preloaded onto a computer. eSMIs are delivered to individuals via their computers/smart devices using the internet and comprise three to six consecutive sessions (45 minutes to 1 hour per session). Individuals complete an online screening survey, any who are identified as being at risk then receive a telephone call from a health professional and are more comprehensively screened to rule out a diagnosis of depression. Those whose symptoms suggest that they are at risk but not yet at the point of being diagnosed with depression, will be offered the eSMI. Where the guided version of the eSMI is used, participants receive personalised written feedback (via app or email) from an instructor within two to three working days. Instructors are usually psychologists trained in the intervention who follow feedback guidelines from a standardised manual.
Evidence	The scientific evidence that was evaluated to estimate the effectiveness of this intervention found that eSMI can reduce depression diagnoses by 21% in the year after the intervention is implemented and 25% in the following year.
Findings	The total cost of providing eSMI to all eligible employees in Australia (i.e. those with mental health symptoms but not a full diagnosis) is approximately \$6.2M. Results showed that eSMI could help avoid absences from work and staff not fully functioning in the workplace to the value of \$6.4M for the employer. There was also a reduction in mental health services and medications used by workers to the value of \$0.1M. This returned a ROI of 0.21 in the first year, increasing to 1.05 in years 5–11.
Recommendations	<p>The provision of e-Health interventions is likely to result in productivity savings which are greater than the costs of implementing such interventions. It is recommended that such interventions are considered for provision by employers, starting within the large organisational context (organisations with over 200 employees) and rolled out to smaller organisations as evidence of impact in these settings becomes available. Companies and agencies involved in trials that evaluated e-Health interventions were supportive, suggesting that it would fit well into the routine operations of many organisations. e-Health programs that might be suitable for such an intervention and are currently available in Australia include MoodGYM, This Way Up, or Mindspot. Scaling up e-Health interventions and large scale roll out would involve raising awareness of these programs (perhaps even with some minor modifications) amongst both employers and employees, and marketing them for the purpose of prevention.</p> <p>Importantly, there may be low rates of uptake and completion of e-Health interventions in practice without support structures in place for employees to start and complete the full program. Therefore, it may be preferable if employers provide support or encouragement for employees to complete the intervention rather than making it entirely self-directed. Similarly, the guided versions of e-Health are preferred since this format has been found to increase compliance of employees completing the program.</p> <p>Results from this study are based on assumptions that may not have fully captured implementation issues that may occur in practice. One issue that employers need to consider is how they will use the information provided at screening as well as information gathered during the intervention. Employees may have concerns about the privacy and confidentiality of health related information being made available to employers if they participate in the intervention. Another issue for employers to consider is whether they would support employees to complete the intervention in work time. Allowing employees to complete the intervention in work time would increase the cost of implementing the intervention, but may increase the willingness of employees to complete the whole program.</p>

Intervention 3

Exercise programs for the prevention of post-natal depression	
Target population	This is a universal intervention offered to all women post birth, not just those at higher risk of post-natal depression (PND).
Intervention	The intervention is a series of group exercise classes (average of four sessions) including options of walking or other cardiovascular and aerobic exercise, or strength training. Women are offered the classes at least four weeks after birth, and can bring their babies with them. Classes are run by trained instructors and where required, transport and childcare (for babies and siblings) can be provided.
Evidence	Evidence for the role of exercise in improving maternal mental health has primarily focussed on treatment of PND rather than prevention. When exercise was offered universally (i.e. not just to those at higher risk) for prevention, 23% of women did not develop PND as a result of the intervention.
Findings	Exercise for the prevention of PND is estimated to prevent 1,705 cases of PND over five years with the majority prevented in year one. The larger returns after five years reflect the increase in productivity cost savings due to reduced absenteeism and job turnover. When four exercise classes are offered to prevent PND there is a positive ROI at one year (1.90) and at five years (2.54). Alternative scenarios also produces positive ROIs including increasing the number of classes to eight sessions (2.07 at five years), and inclusion of transport costs and childcare as well as the increased sessions (1.23 at five years).
Recommendations	Given the positive ROI results found by the current analyses it is recommended that exercise programs for the prevention of PND be piloted in real world settings with a view to a large scale roll out if the effectiveness is maintained in line with the modelling. A well designed pilot would build the evidence base for the effectiveness of the intervention which is currently uncertain.

Intervention 4

Psychological interventions for the prevention of post-natal depression	
Target population	This intervention is targeted at women during their pregnancy (15 to 32 weeks gestation) who after screening, have been found to be at risk of developing post-natal depression (PND).
Intervention	The intervention consists of a brief screening undertaken early in the second trimester of pregnancy during a routine pregnancy care visit with either a midwife or obstetrician. Women who are identified as being at risk are then offered an average of five individual or group based therapy sessions lasting an hour. The psychological intervention chosen for the analysis was interpersonal psychotherapy which emphasises the role of relationships and communication with others in development and maintenance of psychological distress. Therapy is delivered either by psychologists or counsellors.
Evidence	Research indicates that interpersonal psychotherapy is an effective intervention for women who are at increased risk of PND. Pooled results of the six group and two individual therapy trials showed that the intervention reduced the risk of PND by 27%. These trials focused on women who were pregnant and already exhibiting at least some low level symptoms of PND. The follow up period for the studies varied from 6 to 52 weeks after delivery.
Findings	Interpersonal psychotherapy for PND is estimated to prevent 2,673 cases of PND over five years, with the majority prevented in year one, with a ROI of 1.27 in year one and 1.63 at five years. The larger returns (savings) in the fifth year reflect the increase in productivity cost savings due to reduced absenteeism and job turnover over five years. Alternative scenarios modelled also return positive ROIs at five years including: maternal child health nurses delivering the screening and therapy in the woman's home (1.41), having psychologists rather than counsellors deliver the intervention in group sessions (2.17), and removing screening costs on the assumption that this is already occurring as part of routine care in some states and territories (4.04).
Recommendations	Interpersonal therapy for PND is good value for money, with positive ROI in the short and medium term. Group therapy delivered by psychologists had the most favourable ROI. However, whilst the ROI for delivery of the intervention by maternal child health nurses is lower, it may be more beneficial because nurses can better target more disadvantaged groups and availability of the workforce is likely to be greater than for registered psychologists. Further, given the existing infrastructure, it would not be difficult to roll out a program such as the one described here. It is recommended that interpersonal psychotherapy be integrated with current physical health checks pre and post birth, and that greater promotion of screening in the context of prevention, not just treatment of PND, is conducted. This builds on previous treatment focussed campaigns such as the National Perinatal Depression Initiative.

Intervention 5

School based interventions for bullying prevention	
Target population	Bullying among children and adolescents has been recognised as a public health concern as well as a leading risk factor for mental illness. The intervention modelled here is a whole of school anti-bullying program for primary school students.
Intervention	<p>The specific program analysed was the Friendly Schools Program (FSP). The FSP aims to reduce bullying and its associated consequences through building children’s social competence and relationships and by establishing a whole school climate that is not conducive to bullying. The FSP targets four main levels:</p> <ol style="list-style-type: none"> 1. <i>the school level</i> to build the schools’ commitment and capacity to address bullying; 2. <i>the family level</i> to build families’ awareness raising and skills based self-efficacy activities; 3. <i>the classroom level</i> involving students and their teachers through the provision of teacher training and comprehensive teaching and learning support materials; and 4. <i>the individual level</i> where selected activities are used to support victimised students and to help modify the behaviour of students who bully others.
Evidence	The most recent review of studies has shown that school based anti-bullying programs are effective in reducing both bullying victimisation by 15-16% and bullying perpetration by 19–20%. FSP is the only whole of school program that has been evaluated using a trial design in the Australian context. The FSP was associated with a reduction in bullying of 24% from the point of introduction and 32% reduction after two years.
Findings	This model only considers the cost effectiveness of Year 4 and Year 6 students participating in the FSP because these were the year groups used to evaluate clinical effectiveness of FSP in the studies. The intervention is estimated to prevent 165,264 cases of bullying victimisation over ten years, and has a positive ROI both when it is introduced to schools without a bullying program in place (1.56) and when FSP replaces an existing anti-bullying curriculum (2.22), saving an estimated \$224 to \$346 per case of bullying prevented.
Recommendations	Bullying has been associated with considerable economic and health costs in adolescents. This study analysed the cost effectiveness of the FSP as it is the only anti-bullying program which has been evaluated for its effectiveness. The economic analysis showed that the FSP intervention had a positive ROI. As bullying is an ongoing concern, the findings suggest that schools should consider implementing bullying prevention programs that are evidence based. There has been good uptake of the FSP with 1,675 Australian schools implementing this program since 2014. A key consideration for any school, and crucial to the success of the program, is supporting staff capacity to implement the program and adopting a whole of school approach. Given that there are over 9,400 schools in Australia, there is scope for increased roll out of evidence based bullying prevention programs.

Intervention 6

Parenting interventions for the prevention of anxiety disorders in children	
Target population	There is evidence that parental behaviour can increase or decrease the risk for anxiety disorders in children. Parents can play an important role in the prevention of these mental illnesses and parenting programs can have long term benefits on parenting skills and parents' perceptions of their effectiveness in parenting. This intervention targets the parents of preschool aged children who are showing early signs or low levels of anxiety.
Intervention	The intervention is based on the Australian 'Cool Little Kids' program. In this intervention, children aged 4 to 5 attending preschool (day programs for children prior to starting formal schooling, also known as kindergarten or early learning centres) are screened for signs of anxiety disorders. Preschool teachers distribute a brief screening questionnaire to parents to complete at home. The completed questionnaire is returned and assessed by a coordinating unit, staffed by project officers with psychology qualifications located in each Australian state. Parents who have children meeting the criteria for anxiety disorders are offered a place on the parent education program. At least one parent is encouraged to attend a total of six sessions lasting approximately 90 minutes each, conducted in groups of 6 to 16 families. Sessions are led by a clinical psychologist with experience in treating anxious children.
Evidence	Overall, parenting interventions have been found to prevent anxiety disorders in children at a rate of 21% in the first year after the intervention was completed, increasing to 45% in the second year, decreasing slightly to 42% in the third year.
Findings	The total intervention costs were \$3.71M. Costs per preschool child were \$11.20. The intervention is estimated to prevent 3254 cases of anxiety disorders over three years and has a positive ROI of 2.40. The ROI remained positive (1.70) when parent travel time and costs to attend the sessions were factored into the modelling.
Recommendations	Given the positive ROI results found by the current analyses it is recommended that the introduction in preschools of parenting programs for the prevention of anxiety disorders be considered. Before any wide scale roll out, it is recommended that a centrally coordinated roll out to selected preschools be implemented to ensure that there is a large scale evaluation with longer term follow up of outcomes for the children who participate.

Intervention 7

School based psychological interventions to prevent depression in young people	
Target population	Young Australians with a diagnosis of depression have the lowest rates of school attendance and reduced academic performance at school relative to young people with other mental illnesses in childhood and adolescence. Schools have been identified as an important location for the delivery of interventions to prevent depression in young people. The current study modelled the cost effectiveness of delivering universal school interventions to Australian school students in Years 7 to 12.
Intervention	Teachers were trained in the face to face delivery of psychotherapeutic intervention materials by a visiting psychologist. These teachers then deliver a series of 11 sessions/ modules to students in the classroom.
Evidence	The intervention chosen was based on eight trials which have demonstrated that universal school interventions are able to reduce the risk of developing major depression in the near future. The risk of developing major depression was reduced by 53% immediately after receiving the intervention and 38% around 6 months after receiving the intervention.
Findings	The intervention cost a total of \$31.1 million or \$37 per student. When analysing health outcomes, the universal school intervention resulted in 10,604 fewer depression cases and a total of 3.8 million depression free days over ten years with a favourable ROI of 1.19. Alternative scenarios also produced positive ROIs including only modelling the impact on students in Year 12 (1.51) due to the higher number of depression cases averted (2,260), and reducing the number of sessions to only six (2.00). A small time lag was observed between the application of the intervention in the first year and the occurrence of improved health outcomes and cost savings in later years. It follows that a medium to long term perspective should be adopted when considering the cost effectiveness of the universal school intervention.
Recommendations	At present, universal psychological interventions to prevent depression are not widely implemented across schools in Australia. The ROI findings produced by this study indicate that universal psychological interventions should be considered for implementation in Australian schools, subject to ongoing evaluation to ensure the effectiveness is replicated in the real world setting. Any foreseeable implementation of universal prevention in schools need to be sensitive to the burden placed on teachers who would be required to take on an additional workload in order to deliver the intervention. The 'Aussie Optimism Program' and 'Check it Out!' resources on the 'Be You' website (www.beyou.edu.au) are both psychological interventions to prevent depression that are suitable for universal delivery.

Intervention 8

e-Health interventions for the prevention of anxiety disorders in young people	
Target population	Young people in Australia are frequent users of the internet, social media and electronic devices. In addition, young Australians often search for mental health information online. Digital e-Health platforms are increasingly being considered as a means through which psychological interventions for the prevention of anxiety disorders can be disseminated both widely and flexibly.
Intervention	MoodGYM is a locally developed e-Health intervention that has been extensively examined in the Australian context and has been shown to be effective in reducing symptoms of anxiety. The MoodGYM intervention comprises five online modules based on cognitive behavioural therapy principles. The intervention modelled in this analysis was based on the YouthMood project – a large scale trial examining the effectiveness of delivering MoodGYM to 30 schools across Australia. All classroom teachers were provided with a MoodGYM teacher manual, which contained detailed instructions on how to deliver the MoodGYM program in class. The intervention was delivered to students over five weeks with one module presented each week during a single class period. The role of the classroom teacher was to supervise students in their completion of the program and to answer any incidental questions that arose during its completion.
Evidence	The effectiveness of the MoodGYM intervention was based on the findings of three studies evaluating different online interventions (including MoodGYM) to prevent anxiety disorders in young, school aged persons. The MoodGYM intervention was subsequently found to reduce the risk of developing anxiety by 21% immediately after receiving the intervention and 36% around 6 months after receiving the intervention.
Findings	The MoodGYM intervention produced a favourable ROI of 3.06 after ten years and resulted in 10,498 fewer cases of anxiety and a total of 3.4 million anxiety free days over ten years. A time lag was observed between the application of the intervention in the first year and the occurrence of improved health outcomes and cost savings in later years. Alternative scenarios included only modelling students in Year 7, which led to a higher ROI ratio of 4.11, while only modelling students in Year 12 produced a lower ROI ratio of 1.98. These differences were primarily driven by the larger number of anxiety disorder cases averted among Year 7 students when compared to Year 12 students (i.e. 1,649 and 1,361 respectively). Another scenario tested the impact of assuming that 100% of students participated in the intervention (i.e. it was part of the curriculum). This led to a slightly higher ROI ratio of 3.53.
Recommendations	The MoodGYM intervention is not currently implemented extensively across schools in Australia. This study provides good evidence for uptake of this intervention on the basis that it has the potential to result in net cost savings for every dollar invested. The online MoodGYM intervention has several advantages that make it a good choice for implementation across Australia compared to face to face preventive interventions. These include local development and testing, comparatively lower implementation costs than face to face interventions and easier dissemination to rural and remote regions. Any prospective roll out of MoodGYM should be undertaken with awareness of the 'Be You' initiative (www.beyou.edu.au) which currently provides mental health related advice and support to schools in Australia.

Intervention 9

Educational interventions to reduce older persons' loneliness	
Target population	Recent statistics indicate that 19% of Australians aged 75 and above experience loneliness. This intervention is targeted at women aged 55 years and above residing in private dwellings.
Intervention	The Friendship Enrichment Programme (FEP) has been developed in the Netherlands to help women aged 55 and over to improve their wellbeing and alleviate loneliness by enhancing current friendships or developing new friendships. The FEP consists of 12 lessons that focus on topics related to friendship. Each lesson is supplemented by practicing skills that are important in friendship, role playing and a homework assignment. The lessons are delivered to a group of 10 women. Six months after the program, participants have a final meeting to evaluate their success and redefine goals for their future. The program is usually delivered in centres for adult education, community mental health centres and social service agencies by an instructor with a professional education level (for example social work) or university level psychology training.
Evidence	In previous studies, when participants received the intervention the number of women who were lonely decreased by 11% compared with a 6% decrease for women who did not participate in the FEP.
Findings	The total cost of implementing the intervention was \$25 million (or \$155 per women). The intervention produced \$34 million in cost savings after three years and \$72.4 million after five years due to reductions in healthcare treatment costs and productivity gains for women 55-64 who may still be engaged in the workforce. The ROI ratio was estimated to be 1.35 after three years and 2.87 after five years. Alternative scenarios included the assumption that 1 in 5 women who find out about the program ask other women to join the sessions resulting in a ROI of 2.65. When time and travel cost for women was factored in, the ROI dropped from 2.87 to 0.62 after five years. The ROI was also more favourable (3.49) when the intervention was delivered by welfare, recreation and community arts workers rather than social workers.
Recommendations	This study found that there is a positive ROI at five years. However the cost savings are likely to have been underestimated, given that the analysis only considered the impact of loneliness on depression and not on other health conditions such as dementia, stroke, or heart disease. As the current evidence on the FEP is limited, it will be beneficial to update the cost effectiveness analyses as more evidence becomes available. As loneliness research is still at its infancy in terms of identifying effective interventions, other programs aimed at reducing loneliness in older women, or older adults generally, should be evaluated for their cost effectiveness. In this context, further research is also needed with regard to the measurement of loneliness and the impacts of interventions on other related concepts, such as social exclusion.

Intervention 10

e-Health interventions to reduce older persons' loneliness	
Target population	An increasing body of literature suggests that using computers and the internet may reduce loneliness, particularly in the older adult population. The opportunity to communicate regardless of physical distance provides the ability to maintain relationships with friends and family, and thereby gain social support. This intervention was tailored to the Community Visitors Scheme (CVS) which is available to recipients of the Australian Government subsidised residential aged care services or Home Care Packages who have been identified by their aged care provider as being at risk of isolation or loneliness.
Intervention	<p>The Australian Government funds organisations (referred to as CVS organisations) to recruit and train volunteer visitors, whose primary role is to provide friendship and companionship to the socially isolated person. CVS organisations provide volunteer visitors with a basic training/orientation on their role and their obligations. There are currently three types of visits available:</p> <ol style="list-style-type: none"> 1. A one on one visit by a volunteer visitor to a care recipient in an Australian Government subsidised residential aged care home; 2. A one on one visit by a volunteer visitor to a care recipient of a Home Care Package in their home; or 3. A group visit that consists of two or more care recipients at the same time, in an Australian Government subsidised aged care home. <p>The computer and internet training intervention consists of two components. First, special training is delivered to volunteer visitors (10 volunteers per group) by an IT trainer on basic computer and internet use, as well as on more advanced topics, such as online communication, shopping and entertainment. The second component of the intervention involves the volunteer sharing computer and internet knowledge with the CVS recipient.</p>
Evidence	Previous studies have examined the effectiveness of computer and internet training to reduce loneliness among older adults that included volunteer visitors in the Netherlands and the UK. Using results reported in these two studies, the model assumed that the number of lonely adults decreased by 11.8% in the group receiving the intervention compared with the group of older adults who did not receive the intervention. The evidence also showed that at follow up, of those who had never used the internet before, 68% reported using it at least once a week, 28% at least once a day, and 9% many times a day.
Findings	Overall, the total cost of implementing the intervention was around \$2.2 million (or \$463 per CVS recipient). The intervention subsequently produced \$2.3 million in cost savings after three years and \$4.7 million after five years due to reductions in healthcare treatment costs. The ROI ratio was estimated to be 1.02 after three years and 2.14 after five years. When analysing health outcomes, it was found that delivering the intervention to all CVS recipients resulted in a total of 0.5 million loneliness free days after three years and 1.4 million loneliness free days over five years. Alternative scenarios included consideration of the need to provide internet as part of the intervention for those receiving one on one home visits, assuming a broadband plan of \$32.76 per month (or \$393.06 per year). Internet was assumed to be provided (i.e. at no additional cost to the older person) for those receiving visits in residential care facilities, this reduced the ROI to 0.47.
Recommendations	<p>This analysis indicated a positive ROI when implementing computer training for older adults in order to reduce loneliness. However, this result should be interpreted with caution given that the evidence of effectiveness of the intervention was weak. The modelling only considered the impact of loneliness on depression and not on other health conditions such as dementia, stroke, or heart disease. As such, the findings are considered conservative and the intervention may result in greater ROI if these additional impacts were considered. The findings also do not include ROI due to productivity gains, given the age of the target population, and unlikelihood of their participation in the labour force.</p> <p>As the intervention modelled was tailored to the current CVS available in Australia, implementing the intervention within the Australian context is feasible. Providing computer and internet training as part of a group visit to residential care recipients seems to provide good value for money. As such, given the low costs associated with this intervention and likely benefits, this intervention could be considered for roll out within CVS services. However, program evaluation should accompany this roll out to ensure the real world outcomes match those which have been observed in preliminary studies.</p>

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