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Evidence Check

Mental wellbeing interventions

An **Evidence Check** rapid review brokered by the Sax Institute for VicHealth. July 2019

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This report was prepared by:

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Contents

Glossary of terms, abbreviations and acronyms

CBT—Cognitive behaviour therapy: psychotherapy that combines cognitive therapy with behavior therapy by identifying faulty or maladaptive patterns of thinking, emotional response or behaviour and substituting them with desirable patterns of thinking, emotional response or behaviour.

eHealth—The use of information and communication technologies (ICT) for health, including healthcare services provided electronically via the internet.

ICT—Information and communication technologies: technologies that provide access to information through telecommunications.

Indigenous—Refers to people who were native to a territory prior to it being incorporated into a national state, and who are politically and culturally separate from the majority ethnic identity of the state that they are a part of. Indigenous peoples are inheritors and practitioners of unique cultures and ways of relating to people and the environment. They have retained social, cultural, economic and political characteristics that are distinct from those of the dominant societies in which they live. The term Aboriginal and Torres Strait Islander peoples is preferred for Indigenous Australians. However, the terms employed in the reviews and studies being reported are used throughout this Evidence Check.

LGBTIQ—Refers to people's sexuality and gender identity, including people who are lesbian, gay, bisexual, transsexual or transgender, intersex, queer or questioning. Note, however, that this Evidence Check uses whichever terms are used in the reviews and studies being reported. This means that the terms and acronyms used to refer to people's sexuality or gender identity vary throughout the report, as necessary to be consistent with the information being reported (i.e. LGB, GLBT, LGBTQ).

Meta-analysis—A statistical analysis that combines the results of multiple scientific studies addressing a similar question, with each individual study reporting measurements that are expected to have some degree of error.

PRISMA—Preferred Reporting Items for Systematic Reviews and Meta-Analyses: an evidence-based minimum set of items for reporting in systematic reviews and meta-analyses.

PTSD—Post-traumatic stress disorder: a mental health disorder that can occur in people who have experienced or witnessed a traumatic event that may have threatened their life or safety, or that of others around them, such as a natural disaster, a serious accident, a terrorist act, war/combat, rape or other violent act.

NZ—New Zealand

US—United States of America

UK—United Kingdom

Executive summary

Background

This Evidence Check was undertaken for VicHealth to review the recent high-level evidence on risk and protective factors for mental ill health and mental wellbeing. The review also aimed to identify interventions that have been effective in the prevention of mental ill health and the promotion of positive mental wellbeing and that address risk and protective factors. VicHealth was interested in evaluated Australian and international interventions that have been delivered at scale and targeted at the population, community or organisational level for the six specific risk/protective factors of online support, social isolation and loneliness/social support, childhood trauma, housing and homelessness, employment, and income inequality.

The Evidence Check findings will be used to support the development of VicHealth's submission to the Royal Commission into Victoria's Mental Health System.

Scope of review

The authors undertook the Evidence Check in two parts. Part 1 identified risk and protective factors by addressing Question 1: *What is the recent evidence on risk factors and protective factors for mental health and wellbeing?* Part 2 identified interventions through addressing both Question 2: *What interventions, delivered at scale, have been effective in preventing mental ill health and improving mental wellbeing? Which risk or protective factors are targeted in each of these interventions?* and Question 3: *What do recent systematic reviews indicate are effective interventions, delivered at scale, for reducing six specific risk and protective factors?* These were identified by VicHealth after considering the results of Part 1.

The Evidence Check focused on the risk and protective factors associated with positive mental health and wellbeing, or the primary prevention of mental ill health, specifically anxiety and depression. It excluded complex mental illnesses, such as psychosis, as well as suicide prevention. Treatment and individually focused interventions were also excluded.

Methods

We searched Medline, PsycINFO, CINAHL, ScienceDirect, Web of Science, Embase, ProQuest Health & Medical Collection, Joanna Briggs Institute (JBI) and the Cochrane Database of Systematic Reviews in April/May 2019. Searches were limited to peer-reviewed systematic reviews published in the English language between January 2014 and April 2019 from Australia, Canada, NZ, the UK, the US and Western and Northern European countries. One reviewer undertook the searches, and another independently checked them. A quality assessment using the JBI critical appraisal checklist for systematic reviews was undertaken of each systematic review, which was again checked for reliability. Information from the selected reviews was entered on a template developed *a priori*.

Part 1: Risk and protective factors for mental health and wellbeing

Ninety-two systematic reviews met the inclusion criteria for Question 1; 40 were of high quality, 25 of moderate quality and 27 of low quality.

For children, risk factors were being a refugee, homelessness and out-of-home care, screen time and sedentary behaviour, chronic illness, obesity and maternal illness. Protective factors were positive family functioning and supportive communities, and there was some evidence for physical activity.

Part 2, Question 2: Interventions effective in preventing mental ill health and improving mental wellbeing and the risk / protective factors they target

Twenty-nine reviews met the inclusion criteria for Question 2, with most being of high quality.

Education was the main setting in which interventions were delivered at scale; 21 of the reviews were of interventions in this setting. There were four reviews of interventions in workplace settings and four reviews related to interventions in community settings. None of these systematic reviews specifically considered the population groups identified as priorities for VicHealth.

The majority of reviews considered interventions delivered in education settings, mostly primary or secondary schools and focusing on children and adolescents. These generally reported significant effects post-intervention compared with control groups, although with small relative effects. Effects tended to persist in follow-up studies at three, six and 12 months. A wide range of different types of school-based interventions were shown to be effective, including online interventions. Interventions incorporating cognitive behaviour therapy (CBT), skills building, mindfulness and physical activity were effective. Both teacher- and externally-implemented programs showed positive effects. Australian programs often delivered through schools, including FRIENDS, MoodGYM and Resourceful Adolescent Program (RAP), showed generally consistent evidence of effectiveness for symptoms of anxiety and depression.

Workplaces were also shown to be an accessible environment in which to deliver mental health promotion and prevention of mental ill health interventions. Both face-to-face group sessions and online programs were effective methods of delivery. Interventions that show promise in this setting include CBT and mindfulness/meditation-based programs.

Part 2, Question 3: Interventions effective in addressing the specific risk/protective factors of online support, social isolation and loneliness/social support, childhood trauma, housing and homelessness, employment, and income inequality

A very wide search strategy, ranging over the past five years, identified interventions delivered at scale related to the six risk/protective factors of interest to VicHealth. The search found a small number of reviews that met the selection criteria for each factor. Most of these systematic reviews were high quality themselves, but almost all reported that the level of evidence for their findings was not strong due to wide diversity in the interventions, research designs and outcome measures.

Overall, we found limited evidence of effective programs delivered at scale to address these specific risk and protective factors. Social support interventions delivered online show promise in terms of being provided in an accessible way to large population groups. Interventions to address workplace factors, such as stress, interpersonal relations and job demands, appear to be effective and can be delivered at scale directly to the targeted population groups. Similarly, schools provide an effective and accessible setting for the delivery of at scale interventions to address trauma associated with large-scale events (natural events or violent events witnessed by many people) and the trauma experienced by young people who are refugees or seeking asylum. Housing interventions also show promise, not only for increasing housing stability and reducing homelessness, but also for reducing mental health problems. The Housing First intervention was the only at scale intervention that was evaluated in several different reviews and showed promise in terms of housing outcomes; however, one review indicated the program was not cost-effective. Employment programs also can be delivered at scale to people on employment-related welfare, and we identified two reviews showing that skill-based employment programs are effective in increasing the skills of young people and increasing the number of young people successful in finding work.

We did not find any interventions that were effective in addressing income inequality or increasing the income of low-income people. Welfare-to-work programs were generally not shown to be effective in improving people's income levels. While Active Labour Market programs were effective in reducing the number of people on employment-related welfare, with forced participation in employment-related activities, there is no evidence that the people withdrawing from welfare-receipt found employment. There is very little synthesised research literature on the effectiveness of programs to improve income and the reviews that are available do not show these programs are effective.

Background

VicHealth has commissioned a review of the recent high-level evidence on risk and protective factors for mental ill health and mental wellbeing. The Evidence Check will also identify interventions that have been effective in the prevention of mental ill health and the promotion of positive mental wellbeing that address risk and protective factors. Of interest to VicHealth are evaluated Australian and international interventions that have been delivered at scale, targeted at the population, community or organisational level.

The Evidence Check will be used to support the development of VicHealth's submission to the Royal Commission into Victoria's Mental Health System. Its primary audience will be senior staff within VicHealth, who will use it to develop a submission to be read by the royal commissioners and senior bureaucrats.

Scope of Evidence Check

The review considers the risk and protective factors associated with positive mental health and wellbeing, or primary prevention of mental ill health, specifically anxiety and depression.

Evidence Check questions

The review is conducted in two parts. Part 1 addresses the evidence for risk and protective factors for mental health and wellbeing and Part 2 addresses the interventions that have been delivered at scale that are effective, particularly with respect to the key risk factors identified through Part 1.

The Evidence Check questions are:

1. What is the recent evidence on risk factors and protective factors for mental health and wellbeing?
2. What interventions, delivered at scale, have been effective in preventing mental ill health and improving mental wellbeing? Which risk or protective factors are targeted in each of these interventions?
3. What do recent systematic reviews indicate are effective interventions, delivered at scale, for reducing risk factors, or increasing protective factors? This question will explore six risk or protective factors identified by VicHealth after reviewing the results for Part 1 and Question 1.

Key definitions

Some key definitions relevant to the Evidence Check are provided below.

Risk and protective factors

Mental wellbeing and mental ill health result from a complex combination of events and conditions that take place in biological, individual-psychological, social-psychological and structural domains (Commonwealth Department of Health and Aged Care 2000). The interplay between the individual and the environment is critical. The population health model encompasses the full range of risk and protective factors that determine health (at the individual; family, friend, peer; organisation, community; sector/system and society levels).

Positive mental health and wellbeing

"Mental wellbeing is a 'dynamic state in which the individual is able to develop to their potential, work productively and creatively, build strong and positive relationships with others and contribute to the community' (Foresight Mental Capital and Wellbeing Project 2008). Conversely, mental illness occurs when a person's thoughts, feelings or behaviour cause ongoing suffering or an inability to cope with everyday life. Both mental wellbeing and mental illness result from complex interactions between the mind, body and environment" (VicHealth 2015).

Primary prevention of mental ill health, specifically anxiety and depression

"Prevention refers to 'interventions that occur before the initial onset of a disorder' to prevent the development of disorder" (Mrazek et al. 1994). The goal of prevention interventions is to reduce the incidence and prevalence of mental health problems and mental disorders. Prevention interventions may be classified according to their target group as: universal, provided to whole populations; selective, targeting those population groups at increased risk of developing a disorder; and indicated, targeting people showing minimal signs and symptoms of a disorder. Together, the universal, selective and indicated categories of intervention correspond to the concept of 'primary prevention' in the model of prevention applied to mental health by Caplan (1964)" (Commonwealth Department of Health and Aged Care 2000).

Universal interventions are those that are implemented in a population that is not identified on the basis of potential risk or symptoms (Mrazek & Haggerty 1994). For example, in a school setting, universal programs have been defined as *"school-based mental health promotion programs delivered to all students within a class, grade, or the entire school"* (Fenwick-Smith et al. 2018).

Delivered at scale

Scalability has been defined as *"the ability of a health intervention shown to be efficacious on a small scale and or under controlled conditions to be expanded under real world conditions to reach a greater proportion of the eligible population, while retaining effectiveness"* (Milat et al. 2013). The World Health Organization (2016) promotes the delivery of large-scale interventions and provides guidance to organisations on how to scale up their delivery of health-related interventions, defining scaling up as *"deliberate efforts to increase the impact of successfully tested health innovations so as to benefit more people and to foster policy and program development on a lasting basis"*. (World Health Organization 2010).

Although the delivery of interventions 'at scale' is a concept of major significance to the emerging field of implementation science, this term was found to be rarely used in the literature generated by the Evidence Check and no definitions were found in any of the systematic reviews. Instead, the term 'universal' was used often, generally referring to interventions delivered in school settings, to either the whole school or to classes or year grades within the school.

Consequently for the purpose of this Evidence Check, interventions were considered to be 'delivered at scale' and targeted at the population, community or organisational level if they met any of the following criteria: were delivered in multiple settings; were delivered broadly in the community; and/or were delivered as a universal approach in a setting. This allowed for a broad range of interventions to be identified while excluding interventions that were directed at individuals.

Question 1:

What is the recent evidence on risk factors and protective factors for mental health and wellbeing?

Methods

Search strategy

The authors conducted a search of literature in the Medline, PsycINFO and CINAHL databases and the Cochrane Database of Systematic Reviews in late April 2019 to identify systematic reviews that examined risk and protective factors associated with positive mental health and wellbeing or primary prevention of mental ill health, specifically anxiety and depression. Keywords used in the search were:

> mental*, risk, prevention, promotion, protective, well-being/wellbeing, systematic review.

In addition, keywords for factors known to be associated with mental health and wellbeing were searched in combination with the above terms, including:

> hous*, home*, employ*, education, social determinant, inequit*, sport, physical activity, loneliness, isolation, social inclusion and social capital.

Searches were limited to peer-reviewed systematic reviews published in the English language between January 2014 and April 2019 from Australia, Canada, NZ, the UK, the US and Western and Northern European countries.

Review exclusions included articles that covered or fell within the following areas:

- Complex mental illness such as schizophrenia or psychosis
- A primary goal of suicide prevention
- Identifying or treating mental ill health
- Individually focused
- Within therapeutic and clinic services (e.g. arts therapy; psychological treatments; counselling)
- Grey literature

Searches were performed in the Medline, PsycINFO and CINAHL databases, entering combinations of keywords into the subject and abstract search fields to identify potentially relevant articles. Keywords were also searched in the Cochrane Database of Systematic Reviews using the title/abstract/keyword search fields.

For each search, one reviewer screened the titles of the articles to identify those that referred to risk or protective factors for mental health or mental wellbeing. Articles that were obviously irrelevant were excluded at this stage. A sample of excluded articles (10%) was assessed by a second reviewer as a reliability check and there were no inconsistencies.

The full texts of articles that were potentially relevant were then accessed and examined. At this stage, one reviewer identified additional articles that were irrelevant. Again, a sample of these (10%) was assessed by a second reviewer as a reliability check and there were no inconsistencies.

Details of the articles that fulfilled the Evidence Check criteria were entered on a template developed *a priori*. The template included source, quality rating, study type, level of evidence, population/setting, number of studies, outcomes measured, risk or protective factors investigated, and direction or magnitude of effects. One reviewer extracted relevant data into the template and another reviewer independently checked all the template table entries. Any differences were discussed and resolved.

Quality assessment

To determine quality, the systematic reviews were assessed according to the Joanna Briggs Institute (2017) Checklist for Systematic Reviews and Research Syntheses (see Appendix 1). This evaluates scientific quality against 11 questions, where each question must be answered positively to gain a point, resulting in a score ranging from 0–11. Scores of 0–5 were deemed low quality, 6–8 moderate quality and 9–11 high quality. One reviewer assessed the reviews for quality, and another checked 10% of the assessments. Only minor discrepancies were noted, and these were resolved by discussion between the reviewers.

Search results

After removing duplicates, we reviewed 1928 articles. Ninety-two met the inclusion criteria. A flowchart of the literature selection process is included at Appendix 2. Of the 92 reviews, 40 were high quality, 25 moderate quality and 27 low quality.

The high-quality reviews that did not achieve a full score of 11 generally did not assess publication bias and/or were not able to use methods to combine the results of studies due to heterogeneity. The moderate-quality studies had these limitations and they also tended not to have independent review of critical appraisals or ways to minimise data extraction errors. The low-quality studies had these limitations and were also likely to not conduct a critical appraisal and it was often not stated whether there was an independent review of study selection and data extraction.

Findings

Appendix 3 provides summaries of the reviews. Key details for each of the 92 reviews are provided in Table 1. Table 2 summarises the risk and protective factors for VicHealth priority groups. Table 3 summarises the risk and protective factors by age group.

Risk factors

Individual factors: These were lifestyle factors (alcohol, cigarette and other substance use; screen time and sedentary behaviours), sexual orientation and obesity.

Lifestyle factors. Smoking was shown to be a risk factor for later development of depression and anxiety in a high-quality review of studies of adults, although mental health was also a risk factor for smoking in some studies (Fluharty et al. 2017). A low-quality review of studies of Asian-American, native Hawaiian and Pacific Islander youth found cigarette use and alcohol consumption were associated with depression (Wyatt et al. 2015). Substance use was found to be associated with poor mental health and wellbeing for indigenous young people 20 years and under from high-income countries (Young et al. 2017) and for homeless youth aged between 10 and 24 (Medlow et al. 2014).

Three reviews found a relationship between screen time and mental health and wellbeing. In a high-quality umbrella review, (Stiglic et al. 2019) identified one review that found moderate evidence for an association between children and adolescents' screen time and the duration and severity of anxiety symptoms, and one review that found social media screen time, and more than two hours of screen time a day, were associated with higher depressive symptoms. Two other included reviews found screen time was also associated with

poorer psychological wellbeing. The authors discuss the possibility that the negative impact of screen time is caused in part by these activities displacing physical activity. Hoare et al. (2014) found an association between more hours of screen time and more symptoms of depression in obese adolescents, and Hoare et al. (2016) found higher daily screen time and higher internet use were associated with higher depression symptoms in adolescents, with the association with internet use higher in girls. This review also found an association between more TV viewing per week and higher depression symptoms in one study, but this relationship was not found in another study. Both these reviews were assessed as low quality. Hinkley and colleagues' (2014) high-quality review found an inverse relationship between sedentary behaviour and psychosocial wellbeing for children from birth to five years.

Sexual orientation. In a low-quality review of studies examining the relationship between anxiety and depression prevalence in homosexual and bisexual adolescents and adults, Plöderl et al. (2015) found male and female adolescents and adults had elevated levels/rates of depression and anxiety, and that bisexual individuals had higher rates of depression than homosexual individuals.

Obesity. Two reviews focused on factors associated with obesity and depression. Sutaria et al. (2019) found, in a high-quality review, that obese children had an increased risk of depression, with females more likely to develop depression than males. A low-quality review found more hours of screen time and a diet high in meat, meat alternatives and extras (e.g. pizza, chips) were related to higher depression symptoms (Hoare et al. 2014).

Family factors: These were lack of support, partner loss, out-of-home care and the perinatal period.

Lack of support. Family conflict and violence have been associated with higher levels of anxiety and depression in African-American children under the age of 18 (Washington et al. 2017) and poor family relationships have been associated with higher levels of anxiety and depression in indigenous children aged between four and 18 in high-income countries (Young et al. 2017). Several parenting styles have been identified as risk factors for anxiety and depression, including higher levels of authoritarian parenting, aversiveness, inconsistent discipline, inter-parental conflict, over-involvement and withdrawal (Yap et al. 2014). These three reviews were of high methodological quality.

Widowhood. One review examined the mental health impact of widowhood and found high rates of depression and anxiety, with similar levels of depression for widowed men and women (22%), and for people aged under 65 (28.2%) and over 65 (27.9%) (Blanner Kristiansen et al. 2019).

Out-of-home care. A high-quality review of prevalence studies for children in the welfare system found a pooled prevalence estimate (combining the estimates from multiple population studies) of 12% for depression and 18% for anxiety (Bronsard et al., 2016).

Perinatal period. Nine reviews examined factors associated with mental wellbeing and the development of anxiety and depression in the antenatal and postnatal period (Alvarez-Segura et al. 2014, Biaggi et al. 2016, HK Brown et al. 2018, Lawson et al. 2015, Leach et al. 2017, Nakamura et al. 2019, Wenze et al. 2015, Xavier et al. 2018, Yim et al. 2015). These studies identified a range of risk factors, including chronic medical conditions (HK Brown et al. 2018), sleep problems (Lawson et al. 2015), lack of social support (Biaggi et al. 2016), abuse (Alvarez-Segura et al. 2014), not living with partner (Leach et al. 2017), multiple births (Wenze et al. 2015) and alcohol, cigarette and substance use (Biaggi et al. 2016). The majority of studies were low quality, one was moderate quality (Lawson et al. 2015), and three were high quality (HK Brown et al. 2018, Nakamura et al. 2019, Xavier et al. 2018).

Social relationships: Lack of social support, loneliness, social media and cyberbullying have been identified as risk factors for the general population but also, particularly, for LGBTQI people.

Perceived social support and loneliness. A high-quality review of people with a mental illness found elevated levels of depression symptoms in people who reported they were lonely and had poor social support (Wang et al. 2018). McDonald (2018) found sexual minority adolescents experienced lower levels of social support and a more hostile living environment than heterosexual youths, and that lower social support was associated with depression and anxiety. The methodological quality of this review was low.

Social media and cyberbullying. Abreu et al. (2018) found higher depression levels in young sexual minority youth who were exposed to cyberbullying compared with those who had not been exposed, and Escobar-Viera et al. (2018) found LGB people exposed to cyberbullying reported feelings of depression. The methodological quality of these reviews varied, with Abreu and Kenny assessed as low quality and Escobar-Viera et al. providing stronger evidence with high methodological quality. Other aspects of social media found to be associated with higher rates of depression were use of gay hook-up apps by males, and the stress of monitoring and maintaining an online profile (Escobar-Viera et al. 2018). In a low-quality review, Bottino et al. (2015) reported an association between cyberbullying and increased symptoms of depression and anxiety for adolescents. Another review with adolescent samples found increased time online on social networks was associated with depression, because this increased the potential exposure to cyberbullying, which is associated with depression (Best et al. 2014). However, this review presented mixed findings regarding the relationship between online social networking and wellbeing, with some studies indicating social media is associated with reduced anxiety and increased emotional support. Length of time using social media was also found to be related to higher depressive symptoms for children and adolescents, with higher symptoms reported when screen time exceeded two hours a day (Stiglic & Viner 2019). The Best and Stiglic & Viner studies were both of high methodological quality.

Adverse life events: Adverse or stressful life events included migration, refugee status, exposure to violence, chronic illness, caring for someone with a chronic or critical illness, homelessness and drought.

Migration. Two reviews found immigrants had higher levels of depression and anxiety symptoms than the native population of the country they settled in, although a third review did not find this association. A moderate-quality review Bas-Sarmiento et al. (2017) found that in about half the studies examined, immigrants and in particular female immigrants, had a higher prevalence of mental disorders than the native population of the new country, and reported other factors associated with higher levels of mental health problems for people settling into a new country as unemployment, job dissatisfaction, low income and economic difficulties. A high-quality review (Close et al. 2016) found most studies showed first-generation migrants had a higher prevalence of depression, particularly refugees. However, Foo et al. (2018), in a review assessed as low quality, found depression prevalence rates for first-generation migrants varied considerably across studies and was not significantly different from native population rates.

Refugees/asylum-seekers. Seven reviews investigated the mental health impact of seeking asylum and being a refugee, with all studies concurring asylum-seekers had poorer mental health and wellbeing than other migrants or the general population. Although prevalence of anxiety and depression rates varied considerably depending on country of origin and host country, Bogic et al. (2015) found war refugees had a high prevalence of depression and anxiety. This review found Australia had comparatively low prevalence rates for refugee depression (ranging from 2.5%–16%) compared with other host countries. Self-reported levels of depression for detained immigrants tend to be higher than those reported by non-detained refugees or migrants from a similar background (von Werthern et al. 2018). Close et al. (2016) also identified

higher rates of depression among refugees and asylum-seekers, both children and adults, noting that young refugees report high levels of depression. Unaccompanied minor refugees and asylum-seekers have higher rates of depression and anxiety symptoms than accompanied children and adolescents (Kien et al. 2018). Housing has a significant impact on the mental health of asylum-seekers. For example, unaccompanied female minors housed in highly restrictive reception centres (Mitra et al. 2019) or living alone (O'Higgins et al. 2018) have higher anxiety and depression symptoms than girls in routine reception centres or in foster care with a family or with other dedicated support. Housing is also a significant risk factor for adult refugees and asylum-seekers, with poor housing conditions and insecure tenure associated with higher levels of depression and poorer mental wellbeing (Ziersch et al. 2018). The reviews by Bogic et al., Close et al., von Werthern et al. and Kien et al. were assessed as high quality and the remaining three were moderate quality.

Exposure to violence. Two reviews found a significant relationship between violence and anxiety and depression. Intimate partner violence, including psychological, physical and sexual abuse, is associated with higher levels of depression and anxiety, and exposure to multiple types of abuse is associated with increased risk of depression (Lagdon et al. 2014). A review by Perry et al. (2015) found an association between depression and anxiety rates and violence for African-American adolescent males living in neighbourhoods with high exposure to violence and crime. Both reviews were assessed as moderate quality.

Chronic illness/impairment. This Evidence Check identified several reviews that examined the relationship between chronic illness and mental health and wellbeing, one review that examined hearing impairment, and one with a focus on facial scarring. A moderate-quality review found adolescents with a current chronic illness, particularly asthma but also diabetes, had a higher risk of developing depression or anxiety; when symptoms of asthma were no longer present the association with depression and anxiety was no longer evident (Brady et al. 2017). A high-quality review (Secinti et al. 2017) found those who experienced a chronic illness in childhood, including but not limited to cancer, carried a higher risk of anxiety and depression symptoms into adulthood. A low-quality review (Friend et al. 2018) also found survivors of childhood cancer had a higher risk of developing anxiety or depression in adulthood. Also relating to early life, a review of moderate quality (Simanek et al. 2015) found a relationship between maternal prenatal exposure to the influenza virus and depressive symptoms in offspring from that pregnancy. Adults who have had a critical illness were found to have a higher risk of anxiety or depression symptoms and poorer wellbeing in a low-quality review (Hashem et al. 2016). A high-quality review found hearing impairment was associated with a higher prevalence of anxiety; surgical intervention to correct the hearing problem led to a lowering of anxiety levels (Shoham et al. 2018). Another high-quality review found facial scarring was associated with higher levels of depression and anxiety compared with the general population, although prevalence declined over time (JAG Gibson et al. 2018).

Carers. Two reviews examined the association between being a carer and anxiety and depression. One (Haines et al. 2015) found an association between caring for a critically ill survivor of intensive care and higher levels of depression for the carer; in particular, female and younger carers were likely to experience depression symptoms. Carers of a family member with dementia are also at risk of anxiety and depression; in particular, female carers are more likely to experience depression or poorer wellbeing, and carers who are younger, or have a low socioeconomic background, have children, or have low education (Watson et al. 2018). We found these reviews were of moderate quality.

Homelessness. A review of studies of adult homeless people in Germany, assessed as moderate quality, found anxiety and depression were the second and third most prevalent mental health problems (respectively), with substance use being the most common problem (Schreiter et al. 2017). A high-quality

review Bassuk et al. (2015) found homeless preschool and school-aged children had higher rates of mental ill-health (but not depression) and behavioural problems than other children living in the same neighbourhoods. A low-quality review found homeless young people, aged between 10 and 24, had higher rates of depression compared with other young people at school, with prevalence rates ranging between 8% and 61%, and GLBTQ homeless people were more likely to experience depression symptoms than other homeless young people (Medlow et al. 2014).

Drought. One low-quality review found drought is associated with higher levels of depression and anxiety (Vins et al. 2015). Particular risk factors identified in the review include rural and remote people, exposure to an extended period of drought, people dependent on farming, indigenous people, having a perceived stigma regarding mental health issues, a lack of knowledge of support services, previous mental health problems, and experience of adverse life events.

Cultural factors

Ethnicity. Wyatt and colleagues (2015), in a low-quality review, examined cultural factors associated with depression for Asian-American, native Hawaiian and Pacific Islander youth living in the US and found discrimination, ethnic marginalisation, greater acculturation and acculturative stress were associated with higher levels of depression. Discrimination was also a factor associated with poorer mental health and wellbeing for indigenous young people, 20 years and under, from high-income countries, reported in a high-quality review (Young et al. 2017).

Work and school environment

Work conditions. Seven reviews examined factors associated with work conditions and mental health and wellbeing. A high-quality review (Battams et al. 2014) identified four categories of the work environment associated with poorer mental health and wellbeing: individual factors, such as poor health and sleep patterns, being young, middle-aged or female, and stressful life events; team environment factors, such as workplace bullying, low levels of social support, poor human relations and interpersonal conflict; work conditions, such as low skill discretion, low skill occupation, low decision latitude, job overload and high job demands; and work/home interference, such as time pressure and conflict between role demands. A review of moderate quality (Harvey et al. 2017) also identified a range of work conditions associated with anxiety and depression, including low job control, high psychological demands, low social support, procedural or relational justice problems, workplace bullying, and working more than 40 hours a week. Workplace bullying was identified as a risk factor in the previous two reviews, and also in a high-quality review of healthcare workers (Lever et al. 2019). A moderate-quality review (Roche et al. 2016) reported that employment in male-dominated industries, such as agriculture, mining, and manual work, was associated with higher levels of depression for all workers studied, compared with comparator groups or population norms. Two reviews of high methodological quality concluded depression was associated with an imbalance between effort at work and reward received (Battams et al. 2014, Rugulies et al. 2017).

School environment. One high-quality study found a high-demand academic environment was associated with increased prevalence of mental health issues (Aldridge et al. 2018).

Economic factors

Job insecurity. Seven reviews found an association between job insecurity and poor mental wellbeing, anxiety and depression. This included non-secure work, such as temporary agency employment (Hergenrather et al. 2015, Hünefeld et al. 2019) and job insecurity (Glonti et al. 2015, Harvey et al. 2017, Kim

et al. 2015, Llosa et al. 2018, Mucci et al. 2016). These studies ranged in methodological quality, with Llosa et al's review high quality; Hergenrather et al., Glonti et al., and Harvey et al. moderate quality; and the remaining studies being low quality.

Low income. Several reviews examined the relationship between low income and anxiety and depression. A review of country-wide or regional populations Patel et al. (2018) found a relationship between income inequality and depression, with regions with greater inequality also having higher depression symptoms. Another review found an inverse relationship between income and level of depression and other mental health problems for migrants (Bas-Sarmiento et al. 2017). The majority of studies in another review Bruening et al. (2017) found a relationship between food insecurity and poor emotional wellbeing, including depression. Having fewer economic resources was associated with higher levels of anxiety (Moreno-Peral et al. 2014). Job loss, underemployment (Hergenrather et al. 2015) and unemployment were also associated with poorer mental wellbeing (Hergenrather et al. 2015, Kim & von dem Knesebeck 2015, Modini et al. 2016). The majority of these reviews were moderate quality, with only Hergenrather et al. assessed as high quality and Kim & von dem Knesebeck as low quality.

Economic crisis. Two studies reviewed research on large-scale economic crises and their association with anxiety and depression. A moderate-quality review (Glonti et al. 2015) found people with low income and precarious employment were at greater risk of developing depression. A second review of low quality (Mucci et al. 2016) found employees affected by an economic crisis had a higher risk of depression and anxiety and, in particular, married or partnered workers were more at risk of depression. This review also found economic slowdown was associated with higher rates of depression and anxiety for older people.

Living environment

Reviews examining the living environment either focused on housing architecture or location. A low-quality review of urban living found higher depression symptoms were associated with newly constructed dwellings (post-1969), access along a long corridor, and other environmental features (Gong et al. 2016). A high-quality review of urban environment elements associated with depression had mixed findings. For example, seven out of 17 studies found living in a metropolitan area was associated with a depressive mood and three out of four studies found higher population density was associated with depressive mood. All five studies included in a review that examined noise pollution found an association between urban noise levels and depressive symptoms (Rautio et al. 2018).

Protective factors

Individual factors: Individual protective factors included resilience, physical activity, internet use and diet.

Resilience and self-esteem. A review of moderate quality examining the relationship between mental wellbeing and resilience identified several protective individual factors (Fritz et al. 2018). High self-esteem, high distress tolerance, low aggression and low expressive suppression were found to be resilience factors associated with low anxiety and depression symptoms in children who had faced adversity. Another moderate-quality review also identified high self-esteem as a protective factor for positive wellbeing and adaptive psychosocial functioning in refugee children (Marley et al. 2018). A low-quality review of studies of Asian-American, native Hawaiian and Pacific Islander youth (Wyatt et al. 2015) found individual and collective self-esteem were associated with lower levels of depression. Similarly, a high-quality review (Young et al. 2017) identified high self-esteem and optimism as protective factors for mental wellbeing in indigenous youth in high-income countries.

Physical activity. A high-quality review of studies of children from birth to five years old (Hinkley et al. 2014) found physical activity was positively associated with psychosocial wellbeing. Another high-quality review (Dogra et al. 2018) examined the relationship between physical activity and depression symptoms in undergraduate university students; although the findings were inconsistent, most of the studies reviewed found higher levels of physical activity were associated with lower levels of depression. Similar findings were reported by Pascoe et al. (2018). This review found a broad range of physical exercise, including yoga, aerobic exercise and resistance training, was protective against depression and associated with improved wellbeing for secondary and university students. A low-quality review of studies of obese adolescents (Hoare et al. 2014) found regular exercise was related to fewer symptoms of depression, although one study found this relationship only for girls. Antenatal physical activity was associated with lower rates of postnatal depression in a high-quality review (Nakamura et al. 2019). Another high-quality review of studies (Chan et al. 2019) on the relationship between exercise and depression and anxiety in young adult, adult and older people reported mixed results depending on the intensity of the exercise. The majority of studies examining duration of exercise found improvements in mood with 10–15 minutes and up to 30 minutes of exercise, and thereafter only little additional improvement. Walking was also found to be beneficial for mental health and psychological wellbeing, with one review (Kelly et al. 2018) finding a positive relationship between walking and lower depression and also anxiety, and in particular walking in natural environments rather than treadmill-based walking. Eigenschenk et al. (2019) also found being active in the outdoor environment had positive general mental health benefits, including increased self-esteem, self-efficacy and a better self-concept. This review also found being active in the natural environment, particularly in green and blue environments, was positively associated with wellbeing, with reductions in depression and anxiety symptoms for people participating in outdoor sports. These last two reviews were assessed as low methodological quality.

Internet use. For older people (aged 60+), internet use was associated with positive wellbeing and high self-efficacy, with a high-quality study finding lower depressive and anxiety symptoms among internet users compared with non-users (Forsman et al. 2017).

Diet and alcohol: A low-quality review of popularly consumed drinks (García-Blanco et al. 2017) reported that the two studies that examined coffee found a relationship between consumption of coffee and lower levels of anxiety and depression. The findings were mixed for the consumption of tea and cocoa, but for both beverages the majority of studies found a relationship between consumption of these and lower depression and anxiety. A high-quality review found a higher intake of fruit and vegetables is also a

protective factor, reducing the risk of depression (Saghafian et al. 2018). Alcohol has been identified as a risk factor for mental health problems and, while not being identified as a protective factor, a reduction in alcohol consumption was found to be associated with improvements in adult wellbeing and mental health symptoms in a moderate-quality review (Charlet et al. 2016).

Family factors: Protective family factors include positive parent and family relationships and kinship care.

Positive parent and family relationships. Immediate and extended family support, high family cohesion, a positive family climate and parental involvement are key factors that contribute to resilience in children who have faced adversity, according to Fritz et al. (2018), in their moderate-quality review, with these authors highlighting resilience as a protective factor against the development of depression and anxiety. In a high-quality review of studies of preschool and school-aged children and adolescents, a positive parent–child relationship was associated with more positive wellbeing and lower depression and anxiety (McPherson et al. 2014). Family factors associated with more positive mental wellbeing included eating meals together and a high value of trust and fairness in the family. In another high-quality review, higher levels of parental warmth were associated with lower anxiety in adulthood, and higher levels of autonomy granting, monitoring and warmth in childhood were associated with lower levels of depression in adolescence (Yap et al. 2014). Family environment has also been identified as a protective factor for people who were maltreated as children, with a moderate-quality review reporting that living with parents, positive parenting, parental care and good family functioning were protective (Meng et al. 2018). Positive parenting practices, including parental support, positive role models and maternal closeness, and a positive and functioning family environment, were found in a high-quality review to be associated with lower levels of depression and anxiety in African-American children and adolescents (Washington et al. 2017). Young et al. (2017) also found positive family relationships to be a protective factor for mental health and wellbeing for indigenous young people living in high-income countries. A low-quality review found, for female heads of households, family support has a positive association with mental health and wellbeing (Khazaeian et al. 2017). Supportive family was also a protective factor for wellbeing and psychosocial functioning for refugee children in a moderate-quality review by (Marley and Mauki 2018).

Out-of-home care. A high-quality review Winokur et al. (2014) found children placed in kinship care have better mental wellbeing and fewer mental health problems than those placed in non-kinship care.

Social relationships

Social support. In a review of studies of adolescents, adults and older people, Leigh-Hunt et al. (2017) found a positive relationship between high-quality social relationships (variously defined) and subjective wellbeing, with studies showing the quality of relationships are more important than the quantity. This review also found large and diverse social networks are positively associated with lower levels of depression. Positive social relations are a protective factor for psychosocial wellbeing for secondary school students, with positive relationships with teachers and peers being important factors (Aldridge & McChesney 2018). Similar findings were found in a review of children and adolescents by McPherson et al. (2014), with wider and good quality social networks associated with lower mental health problems. In particular, peer support was found to be associated with lower anxiety and depression for rural adolescents. This review also found positive perceptions of belonging and school safety were related to decreased mental health problems and higher levels of psychosocial wellbeing. Peer support was associated with lower levels of depression for young Asian-American, native Hawaiian and Pacific Islander youth living in the US (Wyatt et al. 2015). Although aspects of social media use have been identified as a risk factor for poor mental health and wellbeing, Best et al. (2014) found the social support available through online social networks was also

associated with increased emotional support and feelings of belonging. Escobar-Viera et al. (2018) found LGB people who have a tightly integrated social network with more friends who know each other have lower depression scores. McDonald (2018) also found that higher levels of social support were a protective factor for psychosocial wellbeing for LGBTQ adolescents. Social support is also a protective factor for LGB adults aged over 60, with higher social support associated with lower depression scores (McParland et al. 2016). High social support was also a resilience-building factor for adolescents who had experienced childhood adversity (Fritz et al. 2018) and a protective factor for people who had been maltreated as children (Meng et al. 2018). Social support is also an important protective factor against mental health problems for people living in drought (Vins et al. 2015) and for female heads of households, where higher levels of social support have been associated with higher levels of mental health and lower levels of depression (Khazaeian et al. 2017). The majority of reviews examining social support were of high quality, with two studies assessed as moderate quality (McParland & Camic 2016, Meng et al. 2018) and two as low quality (McDonald 2018, Wyatt et al. 2015).

Work and school factors

Employment. Three systematic reviews found support for the mental health benefits of work. A moderate-quality review (Hergenrather et al. 2015) found employment to be a protective factor for mental health and wellbeing for school leavers and adults, with people who are employed having more positive psychological wellbeing and lower rates of depression and anxiety. Similarly, a high-quality review (van der Noordt et al. 2014) found strong evidence that employment was protective for mental health and wellbeing and re-employment was associated with improvements to mental wellbeing and a lower risk of depression. A moderate-quality study also found having supportive supervision at work was associated with reduced levels of anxiety and depression, improved wellbeing, and contributed to a greater sense of autonomy and mental health promotion (Modini et al. 2016). Employment also has a protective effect on first-generation migrants, with a low-quality review reporting lower depression levels associated with employment (Foo et al. 2018).

School. Two high-quality systematic reviews explored the relationship between the school environment and adolescents' mental health and wellbeing. Aldridge and McChesney (2018) found positive relationships with teachers and peers, positive perceptions of school safety, and positive perceptions of belonging and connectedness were associated with positive mental wellbeing. McPherson et al. (2014) found preschool, primary and secondary students who attended schools with higher quality social environments had lower internalising behaviours, including anxiety and depression. One low-quality review also found school involvement was a protective factor against depression for Asian-American, native Hawaiian and Pacific Islander youth living in the US (Wyatt et al. 2015).

Cultural factors

Ethnic density, belonging, and identity. Living in a community with a high rate of own ethnic density was found to be a protective factor against depression and anxiety in a high-quality review (Bécares et al. 2017). A moderate-quality review (O'Higgins et al. 2018) found connection with people from own ethnic background to be important for unaccompanied refugee minors, who are less likely to develop depressive symptoms if they are placed in foster care with people from the same ethnic background. A low-quality review (Wyatt et al. 2015) found ethnic marginalisation to be a risk factor for Asian-American, native Hawaiian and Pacific Islander youth and, conversely, ethnic belonging and bicultural identity was associated with lower levels of depression. In the case of child refugees, a moderate-quality review found having a

positive attitude towards their own culture and the host culture was associated with positive adaptive functioning and wellbeing (Marley & Mauki 2018).

Living environment

Housing and residential environment. Location and type of housing are associated with anxiety and depression symptoms, with particular design features and settings more conducive to positive mental health. A low-quality study (Gong et al. 2016) found people living in houses with entrances that promote visibility have less depression and anxiety than people living in other types of housing, such as in apartments with deck access. People living with more green space around their home also have lower levels of depression and anxiety (Gong et al. 2016, Rautio et al. 2018). Living near coastal or inland water areas was associated with better mental health and lower depression rates in some studies included in a moderate-quality review by (Gascon et al. 2017). One review, assessed as low quality, found access to high quality and quantity green space was associated with positive mental wellbeing for children and adolescents (McCormick 2017). A minority of the included studies in a high-quality review (Rautio et al. 2018) reported walkability and accessibility was associated with lower depression in older people, and that access to health and cultural services, and healthy and fast food stores, were associated with lower levels of depressive mood.

Community factors

Social capital. A low-quality review of studies examining mental health factors associated with female heads of households found high social capital was associated with more positive mental health and wellbeing (Khazaeian et al. 2017). In this review, social capital included social trust, a sense of belonging and social participation. A high-quality review (McPherson et al. 2014) found children and adolescents benefited from community social capital, including a wider social support network of peers and high-quality social networks, as well as high-quality school and neighbourhood environments. Children also benefited when their parents had a wide and good quality social support network. This review also found regular attendance at religious services was related to better mental health. A low-quality review found strong social capital, including a sense of community and informal support networks, was a protective factor for people affected by drought (Vins et al. 2015). And a moderate-quality review found a sense of belonging and community support were protective factors for refugee children (Marley & Mauki 2018).

Summary for Question 1

This Evidence Check of systematic reviews evaluating risk and protective factors for mental health and wellbeing identified 92 reviews, with almost half being of high quality and a quarter being lower quality reviews. Most of the reviews concluded that there was large heterogeneity in the studies reviewed, particularly in relation to measurement of relevant factors, but also in the outcomes reported. This generally meant the reviews seldom reported strong and consistent evidence. Nevertheless, most concluded that there was generally supportive evidence of associative relationships between the individual, family, social, environmental, cultural and community factors identified that were related to mental wellbeing and/or common mental health problems of depression and anxiety.

The reviews are summarised in Table 2 according to priority groups identified by VicHealth. This table shows there were no reviews related to people with low education, six of people with low income, four of people who were unemployed, four of people who work in low-status occupations, one of Aboriginal or Torres Strait Islander peoples, two of people from culturally and linguistically diverse backgrounds, 10 of people

with migrant and refugee backgrounds, five of people who are LGBTQ, one of people with a disability, and one of people living in rural or remote areas.

Table 3 summarises the reviews by age group. This reveals there were 17 of children aged 0–11, 19 of teenagers, eight of young adults, 43 of adults, seven of perinatal women and six of older adults.

Overall, the reviews revealed that:

For children, the risk factors were associated with being a refugee, homelessness and out-of-home care, screen time and sedentary behaviour, chronic illness, obesity and maternal illness. Protective factors were primarily positive family functioning and supportive communities, and some evidence for physical activity.

For teenagers, risk factors were high screen time and cyberbullying, poor family functioning, chronic illness and obesity, out-of-home care, factors related to refugee status, and high-demand academic environments. Protective factors were positive family functioning, social support (including online), community support and physical activity.

For young adults, risk factors were social isolation and loneliness, homelessness, being in a sexual minority, migration and cyberbullying. Protective factors were physical activity and strong social relationships (including supportive integrated online networks for LGB young people).

For adults and the general population, risk factors were social isolation and loneliness, insecure employment and unemployment, unsupportive work conditions, economic inequality, migration, homelessness, caregiving, physical health conditions, stressful events (including intimate partner violence and drought) and being in a sexual minority. Protective factors were employment, physical activity, strong social relationships and networks, diet, alcohol reduction and green space.

Many reviews had a specific focus on women (mostly) in the perinatal period. Risk factors were childhood and lifetime abuse, chronic medical conditions, stress and unsupportive relationships, disturbed sleep and multiple births. Protective factors were social support and physical activity.

The few reviews that looked at older adults showed the death of a partner, social isolation and loneliness and being a caregiver for someone with dementia were risk factors. Protective factors were social support and physical activity.

Question 2:

What interventions, delivered at scale, have been effective in preventing mental ill health and improving mental wellbeing? Which risk or protective factors are targeted in each of these interventions?

Methods

Search strategy

We conducted a literature search in the Medline, PsycINFO, CINAHL, ScienceDirect, Web of Science, Embase, ProQuest Health & Medical Collection and Joanna Briggs Institute (JBI) databases and the Cochrane Database of Systematic Reviews in May 2019 to identify systematic reviews that examined interventions that have been delivered at scale to address the primary prevention of mental ill health, specifically anxiety and depression.

Keywords used in the searches were:

> mental*, intervention, systematic review

Searches were limited to peer-reviewed systematic reviews published in the English language between January 2014 and April 2019 from Australia, Canada, NZ, the UK, the US and Western and Northern European countries.

Review exclusions included articles covering interventions that:

- Address complex mental illness, such as schizophrenia or psychosis
- Have a primary goal of suicide prevention
- Identify or treat mental ill health
- Are individually focused
- Are within therapeutic and clinic services (e.g. arts therapy; psychological treatments; counselling).

Searches were performed in each database, with the three search terms entered into the subject/keyword and abstract search fields to identify potentially relevant articles.

For each search, one reviewer screened the titles of the articles to identify articles that referred to interventions for preventing mental ill health or improving mental wellbeing. Articles that were obviously irrelevant were excluded at this stage. A sample of excluded articles (10%) was assessed by a second reviewer as a reliability check and there were no inconsistencies.

The full texts of articles that were potentially relevant were then accessed and examined. At this stage, additional articles were identified that were irrelevant. Again, a second reviewer assessed a sample of these (10%) as a reliability check and there were no inconsistencies.

Details of the studies that fulfilled the Evidence Check criteria were entered on a template developed *a priori*. The template included source, quality rating, study type, level of evidence, population/setting, number of studies, outcomes measured, description of the intervention, and direction or magnitude of effects. One reviewer extracted relevant data into the template and another reviewer independently checked all the template table entries. Any differences were discussed and resolved.

Quality assessment

To determine quality, the systematic reviews were assessed according to the (Joanna Briggs Institute 2017) Checklist for Systematic Reviews and Research Syntheses (see Appendix 1). This evaluates scientific quality against 11 questions, where each question must be answered positively to gain a point, resulting in a score ranging from 0–11. Scores of 0–5 were deemed low quality, 6–8 moderate quality and 9–11 high quality. One reviewer assessed the reviews for quality, and another checked 10% of the assessments. Only minor discrepancies were noted, and these were resolved by discussion between the reviewers.

Search results

After removing duplicates, we reviewed 3319 articles. Twenty-nine reviews met the inclusion criteria. A flowchart of the literature selection process is included at Appendix 4. Of the 29 reviews, most (n = 21) were high quality, five were moderate quality and only three were low quality.

The high-quality reviews that did not achieve a full score of 11 generally did not assess publication bias and/or were not able to use methods to combine the results of studies due to heterogeneity. The moderate-quality studies had these limitations and also tended not to have independent review of critical appraisals or ways to minimise data extraction errors. The low-quality studies had these limitations and were also likely not to conduct a critical appraisal and it was often not stated whether there was an independent review of study selection and data extraction.

Findings

Most interventions that were delivered at scale took place in education settings; 21 of the reviews were of interventions in these settings. There were four reviews of interventions in workplace settings and four reviews related to interventions in the community. Appendix 5 provides summaries of the reviews reporting interventions delivered at scale.

None of these systematic reviews specifically considered the population groups identified as priorities for VicHealth. Table 8 summarises the interventions by age group.

Interventions delivered in education settings

Table 4 summarises the reviews of education-setting interventions. A broad range of interventions have been administered at scale in primary, secondary and tertiary education settings, to prevent mental ill health and improve mental wellbeing. Although there is some overlap in the age groups these programs are aimed at, generally programs are tailored either to primary school children or adolescents.

Primary school interventions

The majority of the reviews reported small to moderate effect sizes for interventions delivered at scale in primary school settings, in the reduction of depression or anxiety symptoms and improvements in mental wellbeing.

In a large systematic review of high quality examining the outcomes of 30 studies, Ahlen et al. (2015) found, overall, interventions addressing anxiety symptoms had a positive impact at post-intervention, with gains being maintained in seven out of the 12 studies that had follow-up assessments. Five different anxiety interventions were adopted across the studies, with the named programs including Norwegian Universal Preventive Program for Social Anxiety (NUPP SA), FRIENDS for life and Taming Worry Dragons. This review also examined interventions addressing depression and found the majority of studies had a positive effect on reducing symptoms, with these gains being maintained at follow-up in 15 out of 20 studies. The review

assessed seven depression interventions including the Penn Resilience Program (PRP), Penn Prevention Program (PPP), Resourceful Adolescent Program (RAP) and a Beyond Blue multi-component program. Three named interventions addressed both anxiety and depression: MoodGYM, Learn Young Learn Fair and the Aussie Optimism Program (AOP).

A moderate-quality review by Corrieri et al. (2014) also examined a range of universal intervention approaches delivered to children in upper primary school to address anxiety and depression. Fourteen studies examined the delivery of these interventions in a classroom setting, in school grades three to six. The majority of intervention programs had a small positive effect on the reduction of anxiety and depression symptoms, with the size of effect lessening at each follow-up assessment. Named programs addressing depression were PRP, 4Rs (Reading, Writing, Respect, and Resolution), RAP, MoodGYM and Beyond Blue; and addressing anxiety and depression, FRIENDS and GO!

A high-quality large systematic review of school interventions examined the outcomes of 30 Tier 1 programs delivered in primary and secondary school settings (Arora et al. 2019). Twenty-three studies demonstrated a positive effect for these interventions on depressive symptoms, internalising disorders, stress or mental health. Many of the reviews did not report whether the studies were conducted in primary or secondary schools. Named interventions presented during class time in primary school settings included Urban Initiatives Work to Play, Social Skills Improvement System Classwide Intervention Programs (SSIS-CIP), 4Rs, Pre-K Reaching Educators Parents and Children (RECAP), and Promoting Alternative Thinking Strategies (PATHS).

Another high-quality systematic review that included 81 studies found school-based interventions to prevent anxiety and depression were effective for children and adolescents (Werner-Seidler et al. 2017). Seventeen included studies were of primary school interventions that had an overall small effect size on depression symptoms at post-intervention, and at short-, medium- and long-term follow-up. No difference was found in the effectiveness of various types of interventions. Named interventions addressing depression included PRP, PM-CBI, PTA, PPP, IPT, ACE-Kiwi and the Penn Optimism Program. Similar results were found for interventions assessing anxiety, with a small effect on symptoms evident at post-intervention and follow-up periods, and no difference in the effectiveness of different interventions. Anxiety interventions evaluated in this review included FRIENDS, NUPP-SA, Cool Kids, Taming Worry Dragons and Learn Young Learn Fair.

Woods et al. (2015) examined the effectiveness of school-based programs designed to support the transition to high school. This review, assessed as low quality, found the PRP was the most widely used program in this context and that participants had significantly lower levels of depression than control group participants at post-intervention and the lower symptoms were maintained in the short and long term. Six of the other seven programs also found the interventions were effective at reducing depressive symptoms. The FRIENDS program was the most commonly used program to address anxiety, and children who participated in this intervention had significantly lower symptoms of anxiety than control-group children, with these lower rates maintained at 12- and 24-month follow-up. Other intervention programs used to support children in their transition to high school were AOP, Teen Talk and Learn Young Learn Fair.

Dray et al. (2017), in a high-quality systematic review and meta-analysis that included 57 studies, found interventions designed to increase resilience in children had a positive impact on depression and anxiety symptoms, with CBT-based resilience interventions more effective than non-CBT interventions. The majority of studies assessing depression outcomes found positive improvements in symptoms, and most studies (15 out of 18) found both genders showed these improvements, which were maintained at short-term follow-up, but not long term. A meta-analysis found no overall positive improvement from resilience-enhancing

interventions with anxiety measured as an outcome; however, for children aged 5–10 years only, there was improvement for both genders in the majority of studies. Intervention gains were maintained at short-term follow-up, but not long term. Named intervention programs for anxiety and depression included PPP, Positive Thinking Program (PTP), AOP, FRIENDS, Zippy's Friends, PATHS, 4Rs, Master Mind Program and Mind Up.

A high-quality systematic review of the effectiveness of British school-based mental health promotion programs was conducted by Mackenzie et al. (2018). It found small positive improvements in mental health and wellbeing from some universal school interventions, although for primary schools the findings were mixed and the methodological quality of included studies was poor. Interventions assessed in primary schools included Think Feel Do, PATHS and FRIENDS. Two studies (into PATHS and RAP-UK) considered cost-effectiveness but found neither program demonstrated this.

Another review evaluating social and emotional health promotion programs in primary schools examined mental health outcomes in five of the 29 included studies (O'Connor et al. 2018). The moderate-quality review found both studies assessing anxiety outcomes showed the intervention to be effective, with improvements maintained at six and 12 months, and the one study examining depression as an outcome also found significant improvements at post-intervention. The programs were based on mindfulness, anxiety and coping skills, and stress. In a review of similar scope looking at overall emotional wellbeing, five out of 22 included studies examined mental health and wellbeing outcomes, with one of these studies evaluating primary-aged children (Sancassiani et al. 2015). This low-quality review found the 4Rs program delivered to grade three children was effective in improving psychological wellbeing. The majority of studies covered in the review, however, revealed non-significant mental health outcomes.

Fenwick-Smith et al. (2018) also investigated the effect of resilience-based interventions on the mental health of primary-aged children in a high-quality review that included11 studies. Programs were delivered either in the classroom or as school workshops and ranged from six weeks in duration to a year. These studies found the interventions to be effective at increasing resilience and coping skills; however, only five studies examined depression, anxiety or mental wellbeing as outcome variables and the findings were mixed. The Learn Young Learn Fair, You Can Do It! and Zippy's Friends programs were effective at improving social and emotional wellbeing. The remaining studies found no change in mental health and wellbeing. In addition to the resilience programs mentioned above, the other interventions included the RALLY program, Up Program and Strong Start.

The FRIENDS program, a CBT-based resilience program developed in Australia and endorsed by the World Health Organization, was evaluated in a systematic review by Higgins et al. (2015). Seven studies of primary and secondary students were included in this review, assessed as moderate quality, with all studies reporting significant reductions in anxiety symptoms at post-intervention, and evidence of effectiveness in some studies at four-, 12-, 24- and 36-month follow-ups. All interventions were conducted over 10 weeks, with a 60–75-minute session each week delivered by a trained psychologist in two studies, a trained teacher in four studies, and a teacher and psychologist in one study. One study found younger children, aged between nine and 10, showed reductions in symptoms at post-intervention, whereas older children did not show reductions until 6–12 months after the intervention.

A review of teacher-delivered interventions to improve resilience and social skills was conducted by Franklin et al. (2017). This high-quality review found the majority of interventions were effective at reducing internalising disorders, including anxiety and depression, for children in primary schools. Interventions evaluated in the review included PRP, the Penn Enhancement Program and PRP for adolescents, although it

is unclear from the review which programs were delivered to primary school children and which were in middle and secondary school settings.

Cantone et al. (2015) found in a moderate-quality review of seven whole-school bullying interventions that these interventions had a positive impact on levels of bullying, and also demonstrated reductions in depression and anxiety symptoms and improvements in mental wellbeing. Programs were either additional modules presented in a classroom setting or curriculum components. Named program interventions included Friendly Schools (an Australian-developed program), Peaceful Schools and Steps to Respect.

A high-quality systematic review of yoga interventions, including mindfulness, found significant small effect sizes for these programs delivered in nine primary schools, with similar effects for both genders (Carsley et al. 2018). With the exception of Mindful Yoga, mindfulness and yoga interventions were not named. Five interventions were delivered by outside facilitators and four by teachers. Teacher-delivered interventions had a smaller effect size on mental health and wellbeing outcomes at post-intervention compared with those delivered by an outside facilitator. However, the reverse pattern was evident at follow-up, with only those interventions being delivered by teachers having a significant effect on mental health. The effectiveness of yoga in improving self-esteem and stress reduction was also assessed in a high-quality review by Ferreira-Vorkapic et al. (2015). Three of the six studies that examined psychological wellbeing reported positive benefits from these programs, with outcome measures including anger control, fatigue, anxiety, negative affect, stress and self-control. The yoga programs included mindfulness components, with interventions delivered for between eight weeks and three months and with children aged 9–16 years.

Secondary school interventions

Several systematic reviews evaluated the effectiveness of school-based interventions delivered to adolescents. A high-quality, large systematic review of secondary school interventions (Arora et al. 2019) found the majority of programs had a positive effect on depressive symptoms, internalising disorders, stress or mental health, although three of the programs did not find significant effects on mental health symptoms. Named intervention programs presented during class time in secondary schools included PRP, SSIS-CIP, Stress Innoculation Training (SIT), Creating Opportunities for Personal Empowerment (COPE), and RAP Club.

Werner-Seidler et al. (2017) included 64 studies of secondary school interventions in a high-quality systematic review of 81 studies evaluating interventions for children and adolescents. The review found these programs had an overall small effect size on depression symptoms at post-intervention and at short-, medium- and long-term follow-up. It found no difference in the effectiveness of different types of interventions. Named interventions addressing depression included PRP, Coping with Stress Course, RAP and RAP-Kiwi, FRIENDS, SIT, AOP and MoodGYM. Interventions addressing anxiety were also effective in reducing symptoms, with a small effect at post-intervention and follow-up periods, and no difference in the effectiveness of various interventions. Anxiety interventions delivered to secondary students included FRIENDS, NUPP-SA, Stress Inoculation Training, AOP, PRP and MoodGYM.

In a high-quality systematic review and meta-analysis, Dray et al. (2017) found resilience-building interventions for adolescents had a positive impact on depression symptoms with improvements maintained at short-term follow-up, but not long term. The review found CBT-based resilience interventions were more effective than non-CBT interventions. Named intervention programs for anxiety and depression included Gatehouse, Bite Back, MoodGYM, PRP, FRIENDS, COPE, RAP-Kiwi, RAP-Adolescent, Empower Youth Program, Optimism and Life Skills Program, AOP, Wellbeing Therapy, and Beyond Blue's program. The

interventions were not effective in reducing anxiety symptoms. Named intervention programs for anxiety and depression included Williams Life Skills, Bite Back, MoodGYM, FRIENDS, COPE, Empower Youth Program, AOP and Wellbeing Therapy.

A high-quality review of teacher-delivered interventions to build resilience and enhance social skills was conducted by Franklin et al. (2017). It found the majority of interventions were effective at reducing internalising disorders including anxiety and depression in children in middle and secondary schools, with some studies finding the interventions were more effective for female than male students. Named interventions included in the review studies were Life Skills Training, Steps to Respect, BRIDGE, PRP, PATHS, Yes I Can, Creating a Peaceful School Learning Environment, PEP and Keepin' it REAL.

A moderate-quality systematic review of the FRIENDS program (Higgins & O'Sullivan 2015) also included evaluations of the intervention with secondary school students. Positive effects were not seen immediately with this program, but the students showed reductions in anxiety symptoms at follow-up assessments between six and 12 months after intervention.

In a high-quality review, Clarke et al. (2015) evaluated online interventions for young people aged 12–25 years, with three studies of the MoodGYM intervention delivered to secondary students. One study assessed anxiety as an outcome measure and reported that anxiety levels were significantly lower at post-intervention and at a six-month follow-up. All three studies examined depression symptoms, finding depression levels were significantly lower at post-intervention, with one study finding this reduction was evident only for male students.

Carsley et al. (2018) included early and late adolescents in a study of mindfulness interventions aimed at enhancing individual mental health and wellbeing. Overall, the high-quality review found mindfulness interventions were effective at enhancing mental health and wellbeing. Older adolescents demonstrated greater post-intervention gains, which were not evident for younger adolescents. The review reported similar effects in mental health and wellbeing improvements for both genders. Interventions delivered by external facilitators were more effective at post-intervention; however, longer-term maintenance of these gains was evident only in interventions delivered by teachers.

One systematic review, assessed as low quality, studied indigenous youth populations, with four of the eight included studies examining mental health outcomes (Antonio et al. 2015). All three of the studies that examined depression and anxiety outcomes found the interventions were effective in reducing symptoms. One study examined resilience as an outcome and found significant improvements post-intervention. Intervention programs included a Positive Youth Development Framework, a school-based depression intervention delivered over 30 weeks, a school-based depression and anxiety intervention delivered 2–3 times a week for seven weeks, and a 10-day community-based program during two summers (on an Indian reserve in Canada).

Corrieri et al. (2014), in a moderate-quality systematic review of school-based interventions to prevent mental health problems, included 14 studies that evaluated mental health and wellbeing outcomes for secondary school intervention programs. The majority of interventions addressing depression were effective in reducing symptoms at post-intervention, with a small effect size evident at long-term follow-up. Interventions evaluated in the review included PRP, RAP-Kiwi and RAP-A, MoodGYM, Lisa T and LARS&LISA (German programs) and a Beyond Blue program. The majority of interventions were also effective at reducing anxiety symptoms, with post-intervention improvements and gains evident at short- and long-term follow-ups. Interventions included were FRIENDS, GO, and a physical activity program.

Health interventions in school and community settings for overweight and obese children were assessed in a moderate-quality systematic review by Hoare et al. (2015). The review included seven studies, three of which had mental health and wellbeing measures; the remaining studies examined health-related quality of life. None of the programs were named in the review; one was a manualised educational and coping behavioural skills-building program, one study used the PACE+ intervention (Patient-Centred Assessment and Counselling for Exercise Plus Nutrition Project), and one used ICAPS (Intervention Centred on Adolescents' Physical Activity and Sedentary Behaviour). The review reported a modest decrease in anxiety symptoms in the one study that assessed this (the manualised educational intervention). No change was reported in depression in the one study that assessed this (the manualised educational intervention) and there was no change in self-esteem or self-efficacy in the two studies that assessed this (PACE+ and ICAPS).

A yoga intervention was found to be effective in improving self-esteem and psychological wellbeing when delivered to adolescents in secondary school. In a high-quality review, Ferreira-Vorkapic et al. (2015) reported on one study of students aged 16–17 years that demonstrated improvements in mood for students in the yoga intervention, whereas mood worsened for students in the physical education control group.

A high-quality systematic review by Mackenzie and Williams (2018) assessed secondary schools in addition to primary schools. Seven studies were included of students attending British secondary schools that had school-based programs promoting mental health, wellbeing and resilience. The secondary school interventions included the UK Resilience Program (based on PRP), RAP-UK, mindfulness programs and locally developed interventions. The review reported a small short-term positive effect on depression symptoms from the UK Resilience Program; however, there were mixed findings for RAP-UK, with one study reporting positive outcomes and one reporting negative outcomes. Mindfulness interventions had a modest effect on wellbeing and depression levels, with these gains maintained at three-month follow-up. One study examined the cost-effectiveness of the RAP-UK program and concluded it was not cost-effective, likely due to the cost of employing an external facilitator.

A moderate-quality review evaluating social and emotional health promotion programs in two secondary schools found the one program aimed at reducing anxiety symptoms (Life Skills Training) was effective, and that the one study evaluating a mindfulness program for addressing depression also demonstrated a reduction in depressive symptoms at post-intervention and at three-month follow-up (O'Connor et al. 2018).

The effect of physical activity interventions on depression levels was evaluated in a moderate-quality systematic review by Pascoe and Parker (2018). Four included studies were delivered in high-school settings, with interventions including aerobic or resistance with aerobic exercise, CrossFit, cognitive behavioural skill building with physical activity, and cycling while viewing natural or built scenes. Students participating in the cycling intervention had significantly lower self-esteem than the control group, with no difference between those students who viewed a natural or built environment. Aerobic exercise was found to have a small effect on psychological wellbeing. The CrossFit program had a significant effect on improving self-esteem for youth at risk of developing mental health problems, with the authors proposing that the intervention may protect against the development of depression. The cognitive behavioural skills intervention program was a 15-week intervention including 20 minutes of physical activity. Participants who had elevated depression at the start of the intervention had significantly lower depression at the end of the program compared with the control group, who had participated in a manualised safety program.

Cantone et al. (2015), in a moderate-quality review of whole-school bullying interventions delivered in one Flemish and three Finnish high schools, found these interventions reduced levels of bullying and also resulted in reductions in depression and anxiety symptoms and improved levels of mental wellbeing. Programs included classroom and extra-curricular components.

Tertiary institution interventions

We identified four systematic reviews that evaluated the effectiveness of interventions in addressing mental health and wellbeing in tertiary settings. Conley et al.(2015) conducted a broad systematic review of 103 universal mental health prevention interventions for university students. The high-quality review included 25 studies evaluating psychoeducational interventions, 37 cognitive behavioural interventions, 17 relaxation programs, nine mindfulness interventions, 10 meditation interventions including yoga and three social skills interventions, with interventions delivered in small groups or class groups. Overall, the interventions were effective in improving adjustment and mental health, with skill training programs with supervised practice more effective than skill training programs without supervision and psychoeducation interventions. Skill training interventions without supervised practice did have a modest effect on anxiety symptoms but not on other mental health outcomes. Psychoeducation interventions also had a modest effect on anxiety symptoms but no significant effect on depression or other wellbeing measures.

In a high-quality review, Clarke et al. (2015) evaluated online interventions that were made available to adolescents and young adults aged 12–25. Ten studies evaluated online interventions available to university students, with depression, anxiety or mental wellbeing as outcome variables. Interventions addressing depression included ePREP (an internet-based relationship education program), MoodGYM, Online Anxiety Prevention Program and Loosetheblues; with the exception of Loosetheblues (a web forum), all interventions were effective in reducing depression symptoms in university students. Similarly, ePREP, MoodGYM and MyStudentBody–Stress were effective in reducing anxiety symptoms in university students.

Conley et al. (2016) also examined universal preventive interventions delivered through technology and found the interventions were effective in reducing anxiety and depression symptoms for higher education students. This high-quality review found universal skill training interventions had a positive effect in reducing anxiety and depression symptoms. One study included in the review was a non-skill training intervention, and this also had a positive effect on reducing anxiety symptoms. Technology-delivered interventions evaluated in this review included social skills programs (such as ePREP), and a range of cognitive behavioural, acceptance and commitment, and mindfulness approaches, as well as relaxation, positive psychology and interactive gaming interventions.

Pascoe and Parker (2018) included four studies evaluating physical activity interventions for female university students in a moderate-quality review. The interventions included aerobic exercise or weightlifting, a mindfulness-based cognitive therapy with yoga, or a physical education class, Hatha yoga or resistance exercise, or a group-based aerobic program. At the end of a six-week intervention using aerobic exercise, weight training, or a control group with no intervention, women in the aerobic group had lower depressive symptoms than the weightlifting and control groups. Similarly, another study showed that participants in a group aerobic program had reduced levels of depression at post-intervention compared with participants in a strength-training program. The mindful intervention with yoga asana was found to be effective at reducing depression symptoms in first-year university students compared with the physical education class of stretching and sports games and the no-intervention group. Another study showed a yoga intervention was also successful in reducing depression symptoms in participants in a seven-week

Hatha yoga program, and also in participants in a resistance training group, who showed fewer depression symptoms than those in a passive control group.

Non-effective interventions in school settings

Table 5 summarises a systematic review by Bastounis et al. (2016) of the Penn Resiliency Program as implemented in nine studies with school-aged students. Meta-analysis revealed a non-significant effect and no evidence that the program was effective for depression or anxiety in young people aged 8–17 years.

Workplace interventions

Table 6 summarises the four systematic reviews of workplace setting interventions, showing these were effective in improving mental health and wellbeing for workers. A high-quality review of 11 studies found the majority of workplace interventions were aimed at stress reduction, improving workplace relations and addressing personal physical health, including diet and exercise (Brand et al. 2017). Eight of the 11 studies found these interventions were effective in improving mental health and wellbeing, as assessed by self-report measures. Interventions included mindfulness programs, diet and lifestyle programs, communication and cooperation-based programs and workplace social capital interventions. The overall quality of the reviewed studies was assessed as poor.

A high-quality review of online interventions to address workplace stress by Carolan et al. (2017) found the interventions were effective in reducing symptoms of depression and psychological distress. The review covered a range of workplace settings including education, health, business and other organisations. The interventions used were online websites or apps and included Resilience Online, Mindfulness Goes to Work, Stress Free Now, MoodHacker, GET.ON, Happy@Work, Beating the Blues, and MoodGYM. Stratton et al. (2017) also examined the effectiveness of eHealth interventions in a range of office, health and education workplaces in another high-quality review. They found these interventions were effective, with an overall small pooled effect, in improving depression symptoms for interventions delivered in a universal setting and also offered to selected employees who had indications of possible mental health problems, indicated by absenteeism, stress or days off due to mental health problems. The review also found stress management interventions were effective in reducing anxiety symptoms but that, overall, eHealth interventions included in the review were not effective in reducing anxiety at post-intervention or follow-up. Named online interventions evaluated included Beating the Blues, P4Well, Happy@Work, MoodGYM and MoodHacker.

A high-quality systematic review also examined the effectiveness of universal workplace interventions on levels of depression in a range of employment settings, including the police, manufacturing, offices and healthcare (Yunus et al. 2018). The review included 22 studies and concluded that workplace interventions were effective in reducing depression symptoms at post-intervention and follow-up. Both CBT-based and mindfulness interventions were effective in reducing depressive symptoms, and studies using a combined approach (such as CBT combined with a coping flexibility component) were found to be more effective than single approaches. Interventions evaluated in this review included meditation, yoga, social cognitive programs and acceptance and commitment therapy approaches.

Community settings

Table 7 presents the summary of systematic reviews delivered in community or aged-care settings. The review by Deady et al. (2017) showed for the general population eHealth prevention interventions had a small positive effect on reducing depression and anxiety symptoms. This high-quality review included 10 studies evaluating a range of online CBT, acceptance and commitment therapy and psychoeducation programs, some with weekly activities, others with email and SMS messages. Four studies included follow-

up assessments of depression symptoms and found a small significant difference between symptom levels in people who had participated in the interventions compared with control groups. One study evaluating anxiety symptoms had a follow-up assessment at 12 months and found intervention participants had lower rates of anxiety than the control group.

Clarke et al. (2015) also included community samples in a systematic review of online interventions delivered at scale to adolescents and young adults aged 12–25 years (see Appendix Table 5.1). Four studies examined the mental health and wellbeing outcomes of young adults in the community, with three of these samples recruited through primary healthcare services (health centre medical records, primary care centres, GP referral) and the other study a general population sample. All four studies showed reductions in depression symptoms, with the Master Your Mood intervention demonstrating maintenance of these improvements at three-month follow-up. One online program offered an internet-delivered cognitive behavioural skills training program, one intervention focused on skills for transitioning to adulthood (Competent Adulthood Transition with Cognitive Behavioural, Humanistic and Interpersonal training —CATCH-IT), one study was a mobile phone self-monitoring of mood program four times a day for two weeks, and the Master Your Mood Online program was a professionally facilitated CBT-based group course for youth with depression symptoms.

In a high-quality systematic review of the effect of physical activity on depression symptoms in elderly Korean people, Park et al. (2014) reported that all 18 studies found physical activity interventions were effective in reducing depression symptoms at post-intervention and at three-month follow-up. This review also found, in eight studies, that quality of life improved after these interventions and there was a trend indicating some benefits were maintained at follow-up at three, six and 12 months. Physical activity interventions included weight-bearing, muscular reinforcement, balance, strengthening, walking, dance, Tai-Chi and aquatic-based exercises.

Townshend et al. (2016) investigated the effect of mindfulness-based interventions for parents to strengthen families and improve the wellbeing of parents and children. This moderate-quality review found weak evidence of the effectiveness of these interventions in improving the wellbeing of children and parents, although fathers and mothers did show increases in their level of emotional awareness of their children. Seven studies were reviewed and four different interventions evaluated: Mindfulness-enhanced Strengthening Families Program, Turning to Kids, Mindful Awareness for Parenting and Mindful Families Stress Reduction.

Summary for Question 2

This Evidence Check of systematic reviews evaluating intervention studies for risk and protective factors for mental health and wellbeing identified 29 relevant reviews, with almost all being of high quality. Table 8 lists the reviews according to age group. This shows the majority of reviews considered interventions delivered in education settings, mostly primary or secondary schools and focusing on children and adolescents. These reviews generally found significant effects post-intervention compared with control groups, although generally weak relative effects. Effects tended to persist in follow-up studies at three, six and 12 months. A wide range of different types of school-based interventions were shown to be effective, including online interventions. Interventions incorporating CBT, skills building, mindfulness and physical activity were effective. Both teacher and externally-implemented programs showed effects.

Online interventions, generally CBT-based, were also found to be effective for young adults in tertiary education settings.

There were no reviews of interventions for preschool children.

For adults, most reviews were of workplace interventions, including eHealth interventions delivered in workplaces. Small effect sizes were evident, and interventions focused mostly on dealing with workplace stressors.

For older adults, we found only one review, which showed the positive effect of physical activity interventions for older Koreans.

Interventions delivered in school and workplace settings show particular promise for the promotion of mental wellbeing and primary prevention of mental health problems. Overall, we found effect sizes for primary prevention interventions tended to be small, reflecting that in the delivery of many universal programs, most participants are not currently experiencing mental health problems and therefore there is little room for improvement in their level of symptoms as a result of the intervention. Interestingly, some interventions showed effects for adolescent schoolchildren at follow-up that were not apparent at post-intervention, indicating the possibility that these students have learned coping skills that, over time, they are applying.

Many primary school interventions had implemented the FRIENDS program, with evidence of a small effect for both anxiety and depression symptoms at post-intervention and follow-up. Several other primary school programs were implemented, again with promising results for small reductions in anxiety, including Cool Kids, Taming Worry Dragons, and Learn Young Learn Fair. Interventions that had been implemented in primary schools that were effective in reducing depression symptoms were MoodGYM, a Beyond Blue initiative, Positive Thinking Program, Aussie Optimism Program, Zippy's Friends, PATHS, Master Mind Program and Mind Up. The effectiveness of at scale delivery of the programs shown in these systematic reviews highlights the importance of the promotion of positive mental health in primary-aged children and that school settings provide an effective and accessible setting in which to promote mental wellbeing.

Similarly, in high-school settings, mental health promotion and primary prevention programs had a small effect on depression, anxiety and mental wellbeing, again highlighting the value of school settings for the promotion of mental wellbeing for students. Both online and face-to-face delivery of programs were effective in reducing anxiety and depression symptoms and improving wellbeing. CBT and mindfulness/meditation programs were generally effective, indicating the learning and application of positive coping skills and practices. Programs that were introduced in many of the intervention studies in secondary schools to address depression included the Resourceful Adolescent Program and MoodGYM (both Australian-developed programs), and interventions used to address anxiety in many of the studies included FRIENDS, GO, COPE, Life Skills Training, meditation, yoga and physical activity programs.

Interestingly, however, one review and meta-analysis of the scaling up of the Penn Resilience Program in primary and high schools (Bastounis et al. 2016), over nine studies, revealed non-significant effects.

Workplaces were also effective settings for the delivery of at scale mental health promotion and primary prevention interventions, with online and face-to-face interventions effective in reducing depression and anxiety symptoms and improving mental wellbeing. Several reviews included studies of targeted interventions in the workplace, with promotion and primary prevention interventions made available to people with higher levels of stress in the workplace or who were showing absenteeism.

There were very few studies of interventions delivered at scale in community settings. Interventions delivered online were effective for young adults and for the broader community, with reductions in

depression and anxiety symptoms, effects that were maintained at follow-up in some studies. Online delivery of interventions at scale shows promise for making available to the broader community programs that promote mental wellbeing and prevention of mental ill health.

Exercise programs and physical activity were found to be an effective intervention for older people in reducing depression and could also be implemented at scale in community and residential aged services.

This Evidence Check has identified many interventions that are effective in the promotion of mental wellbeing and the primary prevention of mental ill health. However, many gaps in the research literature are apparent. There are very few reviews of studies in community settings, aged-care services or preschool settings. Furthermore, there are no systematic reviews that have synthesised research findings for any of VicHealth's priority groups. Consequently, this Evidence Check is limited in what it can determine to be effective at scale interventions, beyond school and workplace settings.

Question 3:

What do recent systematic reviews indicate are effective interventions, delivered at scale, for reducing risk factors?

The six risk/protective factors selected by VicHealth for this component of the Evidence Check were: online social networks, social and community support, employment and work conditions, childhood trauma, housing conditions and homelessness, and income inequality.

Methods

Overall search strategy and quality assessment

We searched the Medline, PsycINFO, CINAHL, ScienceDirect, Web of Science, Embase, ProQuest Health & Medical Collection and Joanna Briggs Institute databases, and the Cochrane Database of Systematic Reviews. Searches were conducted in May 2019 and were originally limited to peer-reviewed systematic reviews published in the English language over a two-year period from January 2017 to May 2019. However, this resulted in very few articles being retrieved that were subsequently found to be relevant, so all searches were extended to a five-year period from January 2014 to May 2019. Searches were contained to interventions that were delivered at scale in Australia, Canada, NZ, the UK, the US and Western and Northern European countries.

Searches were performed in each database, with combinations of the search terms entered in the subject/keyword and abstract search fields. We undertook separate searches for each risk/protective factor (search terms are listed below).

For each search, one reviewer screened the titles of the articles to identify those that referred to interventions for preventing mental ill health or improving mental wellbeing for the relevant risk factor. Articles that were obviously irrelevant by title or abstract were excluded at this stage. A sample of excluded articles (10%) was assessed by a second reviewer as a reliability check and there were no inconsistencies.

The full texts of articles that were potentially relevant were then accessed and examined. At this stage, one reviewer identified additional articles that were irrelevant. Again, a sample of these (10%) was assessed by a second reviewer as a reliability check and the few inconsistencies were reconciled by discussion.

Details of the articles that fulfilled the Evidence Check criteria were entered on a template developed *a priori*. The template included source, review quality rating, level of evidence, population/setting, number of studies, outcomes measured, description of the program/intervention, and direction or magnitude of effects. One reviewer extracted relevant data into the template and another reviewer independently checked all the template table entries. Any differences were discussed and resolved.

The quality of included systematic reviews was assessed according to the (Joanna Briggs Institute 2017) Checklist for Systematic Reviews and Research Syntheses, following the same procedure reported in Question 1. One reviewer assessed the reviews for quality, and another checked 10% of the assessments. We noted only minor discrepancies, and these were resolved by discussion. Again, the high-quality reviews that did not achieve a score of 11 were those that did not assess publication bias and/or were not able to adequately combine studies due to heterogeneity. The moderate-quality studies had these limitations and

they also tended not to have independent review of critical appraisals or ways to minimise data extraction errors. The low-quality studies had these limitations and were also likely not to conduct a critical appraisal and it was often not stated whether there was an independent review of study selection and data extraction.

Individual search strategies and results

PRISMA flowcharts for the search results for each of the risk/protective factors are provided at Appendix 6.

Online social networks

Keywords used in this search were:

> social, 'Internet use', online, in combination with intervention and systematic review.

After duplicates were removed, 300 articles were reviewed. Four reviews met the inclusion criteria; all were of high quality.

Social and community support

Keywords used in this search were:

> social support, community support, social relationship, social network*, in combination with intervention and systematic review.

After duplicates were removed, 1281 articles were reviewed. Four reviews met the inclusion criteria; one was high quality and three were moderate quality.

Employment / work conditions

Keywords used in the search were:

> unemployed, employ*, 'work conditions', 'job security', 'work environment', intervention, in combination with systematic review.

After duplicates were removed, 2117 articles were reviewed. Three reviews met the inclusion criteria for interventions addressing employment and five reviews for work conditions; all were high quality.

Childhood trauma

Keywords used in the search were:

> trauma, abuse, 'forced migration', refugee, with child* and systematic review.

After duplicates were removed, 630 articles were reviewed. Three reviews met the inclusion criteria; all were high quality.

Housing and homelessness

Keywords used in the search were:

> hous*, homeless, in combination with intervention and systematic review.

After duplicates were removed, 455 articles were reviewed. Four reviews met the inclusion criteria; three were high quality and one was moderate quality.

Income inequality

Keywords used in the search were:

> 'low income', welfare, 'Government assistance', pension in combination with intervention and systematic review.

After duplicates were removed, 1312 articles were reviewed. Three reviews met the inclusion criteria; two were high quality and one was low quality.

Findings

The following section describes the reviews of interventions delivered at scale for each of VicHealth's six chosen risk/protective factors: online social networks, social and community support, employment and work conditions, childhood trauma, housing, and income inequality. Details of these reviews are provided in the tables in Appendix 7.

Online social networks

Four systematic reviews evaluated the effectiveness of online interventions in improving social support and networks (Table 9). While it was unclear from these reviews if the interventions had been delivered at scale, each intervention had the potential to be implemented at scale.

A high-quality review by Khosravi & Ghapanchi (2016) provided an overview of the effectiveness of technological interventions to address social isolation in older adults. The review found two types of technological interventions—general ICT and robotic—had been evaluated for addressing social isolation and that both were effective, although general ICT interventions were better. A related review, also of high quality, by Khosravi, Rezvani et al. (2016) identified eight types of technological interventions that had varying levels of effectiveness at addressing social isolation and loneliness. In the 34 studies included in the review, general ICT interventions were the most common type of intervention and were the most effective at addressing social isolation and loneliness. Other interventions included robotics, tele-care, video games and 3D programs, a personal social management system to support social connectivity and a chat room. Social networking sites were also included as an intervention in five studies, although these did not have outcomes of social support or social isolation. The level of evidence was not specified in either of these reviews.

In another high-quality systematic review, Morris et al. (2014) evaluated the outcomes of 18 studies that had implemented smart technology interventions with older adults living at home. Interventions included online support groups, information sites, interactive sites, computer and internet use training, bulletin boards and self-help groups. The majority of the studies examining social support and social networking found these interventions were effective for older people. There were mixed findings for the effectiveness of online interventions in addressing loneliness, with three of the five studies finding they were effective, and two with inconclusive results. These interventions were also effective at improving quality of life, which was included as a measure of social connectedness. Evidence was mostly NHMRC level II.

Niela-Vilén et al. (2014) examined the effectiveness of internet-based peer-support programs for parents. Their high-quality review of 38 studies, where most studies were assessed as having excellent-quality evidence, found these support groups were effective in improving emotional support for mothers, providing affirmation and information for fathers in their transition to fatherhood and, for mothers and fathers, providing information exchange and connection with other parents. This review provided an overview of the effectiveness of online parent support groups; however, because results of individual studies were not reported, it is difficult to evaluate how effective these programs were.

Social and community support

Four systematic reviews examined the effectiveness of social and community support interventions delivered at scale, with three of these interventions aimed at older adults (Table 10).

Cohen-Mansfield et al. (2015) reviewed group interventions with older people to address loneliness, in community or institution settings. This moderate-quality review found educational interventions with a psychosocial component were effective or potentially effective at reducing loneliness, but its findings were mixed for group-based interventions without a psychosocial component; a rehabilitation program with group discussions was potentially effective at reducing loneliness, an intervention teaching coping skills was inconclusive, and a computer training course was ineffective at decreasing loneliness for participants. Shared activities, such as a choral group or group aerobic activity, were effective or potentially effective at reducing loneliness. Overall, the level of evidence was not specified.

A moderate-quality review by Gardiner et al. (2018) examined a range of different interventions to address loneliness and social participation, including social facilitation interventions, group-based psychological therapies and leisure skill interventions. Social facilitation and leisure skill interventions were effective at reducing loneliness and social isolation. However, the two group-based psychological interventions, a group rehabilitation program and a cognitive enhancement program, were not effective at reducing loneliness, although participants in the rehabilitation program did have an increase in their number of friendships after the intervention.

Smallfield et al. (2018) examined a range of interventions to improve social participation among older people. In this high-quality review, four of the 11 interventions were community-based and delivered at scale. A mindfulness-based group intervention program was effective at reducing loneliness, and at the conclusion of a wellness program, more participants reported being involved in community activities than when the program commenced. Participants in a psychosocial group that met weekly for three months reported having more new friends post-intervention, and 40% of the group participants continued to meet for a year after the program ended.

We located one moderate-quality review that addressed social support interventions in low-income, indigenous or deprived urban communities (Flores et al. 2018). Four of the seven studies included in this review were interventions delivered at scale in countries of interest to this Evidence Check. Two interventions were effective in improving social capital; a community development strategy with social activities to promote community integration was effective in reducing loneliness; and a manualised program for socially isolated people was effective in improving sense of community and social capital. The other two interventions, an indigenous choir and the Well London program, did not deliver significant improvements in social capital measures.

Employment and work conditions

We located three systematic reviews that evaluated the effectiveness of employment interventions (Table 11). Two of these studies looked at welfare policy, in particular the effect of Active Labour Market programs on employment and receipt of unemployment benefits. Filges et al. (2017) found in a high-quality review that the threat of compulsory participation in employment-related activities had an effect on the number of people receiving unemployment-related welfare, with a significant number of people withdrawing from welfare-receipt just before Active Labour Market participation requirements began. In another high-quality review, Kluve et al. (2019) also looked at Active Labour Market programs and their impact on youth employment levels and found programs that provided a combination of interventions were more effective at addressing youth unemployment. The review included 65 studies from high-income countries, with the

remainining 48 studies from low- and middle-income countries. More than 50% of the labour market programs included skill development as the primary component of the intervention. While, overall, the review found labour market programs were effective in helping young people find employment, interventions consisting of employment services or subsidised employment were least effective, and entrepreneurship and skill training interventions were more likely to result in positive employment outcomes.

A high-quality systematic review by Mawn et al. (2017) examined employment, training and education interventions for young people not currently employed or in training. Interventions included skill training, both in classroom and on-the job settings, social skills training and various employment support services, such as a Youth Contract. The review found the majority of the interventions aimed at young people were multi-component, combining education or skills development and on-the-job training, and approximately 50% of employment interventions were effective in assisting young people to find employment. Keeping a job diary was one intervention that was associated with higher rates of employment. Single-component interventions and case management and individually tailored support interventions were less effective in securing employment for young people.

Five reviews evaluated various aspects of the work environment (Table 11). Daniels et al. (2017) assessed the effectiveness of shared social activities in the workplace for improving job satisfaction. This high-quality review found five of the six interventions that had job satisfaction as an outcome were effective, with other positive improvements including group cohesion, team working and employee initiative. In another high-quality review, Robertson et al. (2015) assessed the effectiveness of resilience training interventions in the workplace. The review found the majority of interventions, including the Master Resilience Training program, Promoting Adult Resilience and Stress Management and Resiliency Training, were effective in improving employees' levels of resilience. Other positive outcomes of the interventions included lower levels of stress among participants and improvements in mental health and wellbeing.

A review examining work engagement strategies found mixed results, with only 50% of the interventions effective. Knight et al. (2019) examined the effectiveness of 40 interventions in a high-quality systematic review. Interventions included positive psychology, mindfulness, psychosocial interventions, training to reduce workload, managerial job design, CBT, leadership development, occupational stress and several other programs. The studies that examined outcome variables related to employee satisfaction, such as job satisfaction and employee wellbeing, found these interventions had positive effects. However, most of the studies in this review focused on employee engagement and the impact this had on productivity.

In a high-quality review, Romppanen et al. (2017) evaluated the effectiveness of workplace interventions to improve workplace resilience, relations with other staff members and control over decision-making for nurses. Group-based programs promoting respect and engagement at work were effective in improving relationships with other team members, reducing staff turnover and increasing job satisfaction. Stress management programs were effective in reducing workplace stress, and supervision training and work development programs were effective in improving staff control over decisions and other workload issues.

A systematic review by Ropponen et al. (2016) examined interventions implemented in workplaces to improve work–life balance. Interventions included self-rostering, reducing working hours and part-time options, workplace childcare, childcare allowances, maternity and paternity leave, a Positive Parenting Program, mindfulness interventions and alternative work and dependent care support arrangements. This high-quality review found interventions aimed at addressing factors associated with work–life balance were

effective in reducing stress and days absent. Four studies addressed job satisfaction and found the group-based resilience interventions were effective in improving employee wellbeing and job satisfaction.

Childhood trauma

Three studies evaluated interventions delivered at scale to address childhood trauma (Table 12). These interventions were aimed at people who had experienced natural disasters, war, refugee status and asylum-seeking, and violent events. The three reviews also included other types of abuse and trauma experienced in childhood, with interventions aimed at children, adolescents or adults; however, the interventions generally were individual or group-based therapy rather than being delivered at scale outside a therapeutic context. This was particularly the case for interventions to assist people who had been exposed as children to domestic violence or physical or sexual abuse.

Brown et al. (2017) evaluated the effectiveness of interventions for children and adolescents exposed to traumatic events in a high-quality review. Of the 36 studies included in the review, nine assessed classroom interventions for large-scale delivery of support for children affected by natural disaster, war, terrorism and a large-scale accident. Interventions included ERASE-Stress (Extending and Enhancing Resiliency Among Students Experiencing Stress), Overcoming the Threat of Terrorism, and other classroom interventions using CBT, EMDR (eye movement desensitisation reprocessing) or narrative therapy. Interventions were effective at reducing trauma-related symptoms, with no significant difference found between intervention types. Interventions delivered by professional therapists were more effective than those delivered by teachers or other school staff.

A high-quality systematic review of 51 trauma-focused interventions was conducted by Gillies et al. (2016). Four interventions were delivered at scale, with one aimed at children and adolescents who had experienced head injury and been hospitalised, one at children who had experienced a natural disaster, and two at children who had experienced and/or witnessed violent events. The intervention to support children and adolescents who had experienced and/or witnessed violent events was a psychoeducation program conducted in US schools, with one study in a high school and a second study in two elementary schools. The effectiveness of a grief and trauma intervention after Cyclone Katrina was evaluated in four elementary schools. An Australian study examined the effectiveness of an online program to support children who had experienced a head injury. The review did not discuss the effectiveness of individual studies and interventions although, overall, it reported that interventions aimed at symptoms associated with exposure to violent or dramatic events were effective in reducing PTSD.

Tyrer et al. (2014) evaluated 13 school-based interventions aimed at children and adolescents who were refugees or seeking asylum. This high-quality review assessed a range of intervention types including CBT-based programs, creative arts therapy, supportive therapy and skill-based groups. The interventions were group-based within school settings, targeted at children and adolescents who had refugee and asylum-seeking backgrounds. The review found these interventions were effective at reducing symptoms of depression, anxiety and PTSD, and functional impairment. Six of the interventions had comparison groups of individuals receiving individual therapy; however, the review does not report on the relative effectiveness of group or individual interventions.

Housing and homelessness

Four systematic reviews evaluated the effectiveness of interventions aimed at improving housing stability or conditions or reducing homelessness (Table 13).

Bassuk et al. (2014) evaluated the effectiveness of housing interventions for families. This high-quality review of seven studies found interventions were effective in helping families settle in stable housing, although some studies showed ongoing subsidies were necessary to assist them to maintain their housing. Interventions included paid rehousing approaches (with 2–6 months of rental assistance and case management), transitional housing and access to intensive services, permanent housing subsidy, and permanent supportive housing for as long as needed (with on-site services and intensive case management). The majority of the interventions included case management, with regular meetings with participants, and several interventions also included access to integrated services and instrumental support. Several studies also evaluated parental and child wellbeing associated with the housing intervention, with some of these studies showing the housing interventions were also associated with improved mental health. Other benefits associated with stable housing, examined in several studies, were family reunification, with some children rejoining their family, and employment, although employment was not always stable.

A systematic review of 14 studies by Benston (2015) investigated the effectiveness of housing interventions for homeless people with a mental illness. In this moderate-quality review, six of the studies evaluated Housing First interventions; little detail is provided on the other interventions, although they generally involved intensive case management. Five studies showed post-intervention participants had a greater proportion of their time in housing; however, two studies showed no difference in outcomes between the intervention groups and the control groups, although it is unclear what the participants in the control group received in terms of support and case management. Two of the five studies that assessed mental health symptoms as an outcome found improvements; the other three studies did not find any significant change in symptoms.

Krahn et al. (2018) investigated the effectiveness of housing interventions for pregnant women in a high-quality review of eight studies. Interventions included supportive housing with intensive case management, a community-based case management program for nine months, a modified therapeutic community, and an ecologically based intervention with the mother's own choice of apartment, where she was given rent and utility assistance for three months. Each intervention involved intensive case management and support. More women in the housing interventions attained stable housing or more days in housing compared with control groups, which included women receiving treatment as usual, in terms of housing support. Improvements in mental health, for mothers and children, were also associated with the housing intervention.

In a large and detailed high-quality review, Munthe-Kaas et al. (2016) examined the outcomes of 43 housing interventions addressing either the number of days homeless, or transition to stable and secure housing. The review found large-scale interventions fell into four categories: high-intensity case management, abstinence-contingent housing programs, non–abstinence-contingent interventions and housing vouchers (financial support towards own-choice housing). The majority of included studies (N = 26) focused on high-intensity case management interventions, and the review found these were effective in increasing stable housing, at post-intervention and at 12–18-month follow-up, compared with usual housing services. High-intensity case management was also effective at reducing the number of days people were homeless. Both abstinence-contingent and non–abstinence-contingent services were also effective at reducing homelessness and improving housing stability, with one study demonstrating that Housing First, a non–abstinence-contingent program, was more effective in providing stable housing than the abstinence-contingent program. Interventions that provided predominantly financial assistance had mixed findings, showing some effectiveness at reducing homelessness and improving housing stability; however, the level of evidence for these outcomes was low.

An additional article assessed the cost-effectiveness of the Housing First program (Ly et al. 2015). This moderate-quality review did not assess housing or homelessness as an outcome of the housing intervention and is therefore not included in Table 13. The review discusses the findings of 12 published studies, with a further 22 unpublished studies available in an online supplement. Most of the included studies focused on homeless people with serious mental illness, while other studies examined the effect of the intervention on high-cost service users (such as veterans or people with severe alcohol use disorder). Most studies approached the costs of programs from a government or health insurer perspective, although this was not clearly stated in the majority of studies. All studies that used a pre–post design (N = 21) and reported on the impact on costs showed the Housing First program delivered cost savings. However, when compared with control groups, Housing First is a more expensive initiative and although cost offsets will be evident, it is unclear if these savings are likely to exceed the cost of implementation of the program and it is uncertain if they will meet the cost of the intervention. The authors extend their discussion beyond cost savings to consider the residential stability and quality-of-life effects of these programs on vulnerable members of society.

Income inequality

Table 14 summarises the three reviews of income inequality interventions. Two high-quality reviews investigated the effect of lone parents' participation in welfare-to-work programs and income level. Neither review found these programs had much impact on income, although one study found there was a lower level of welfare receipt associated with the interventions. Campbell et al. (2016) found welfare-to-work interventions caused increased stress for participants, particularly with work demands in addition to their domestic responsibilities, and that most participants remained in a state of financial hardship, struggling with regular bills and rent payments. Childcare was an additional financial cost, difficult for lone parents to cover with low-income jobs. Other government policies, such as the UK's Working Tax Credit, provided additional income benefits for participants. Some studies showed small income increases could have a detrimental impact on other benefits if participants crossed an eligibility threshold. M Gibson et al. (2018), in a high-quality detailed systematic review of interventions, found welfare-to-work programs had a small effect on incomes, not evident at 18–24 months but significant at 25–48-month and 49–72-month follow-ups. The overall effect of these programs on income was small. A few studies examined levels of welfare receipt and reported reductions that were evident at each of these follow-up assessments. Both reviews drew attention to mental health factors associated with the increased stress and additional responsibilities of work, with some studies finding these interventions had a small negative effect on maternal and child mental health, although the findings were mixed.

In a low-quality review, Holtyn et al. (2017) investigated the effectiveness of paid incentives to return to work for welfare recipients. Their review provides a detailed overview of each of the five interventions that were assessed in the included studies. Only one program resulted in significantly higher income for participants compared with usual welfare benefits; the program was based on a 21-month earned income disregard, during which time this income was removed from their welfare calculations. Outcomes of the other four interventions showed incomes remained low, often not differing from that of control group participants who received the usual welfare payments. Program modifications were discussed that might improve the effectiveness of these interventions in other settings. This review was of particularly poor quality, however.

Summary for Question 3

This Evidence Check used a very wide search strategy, extended across the past five years, to identify interventions delivered at scale and related to the six risk/protective factors of interest to VicHealth. A very

small number of reviews were found that met the selection criteria. Most of these systematic reviews were of high quality themselves, but almost all reported that the level of evidence for their findings was not strong because of the diversity of interventions, research designs and outcome measures.

Three of the four reviews assessing online social networks focused on older adults and the fourth was of parents. For older people, technology in the form of both technical aids generally and communication aids improved social participation and wellbeing. There was some evidence that online social support and communication was effective for older people. For pregnant women and new parents, the review found some evidence that online communication improved connection.

Three of the four reviews of interventions for social support also focused on older adults. These found a range of psychosocial interventions could improve social support for older people. One review focused on indigenous people, but the studies had high risk of bias and covered a wide range of interventions, although they generally concluded that social interventions were effective.

In the case of employment and work conditions, two reviews that focused on young people showed multi-component and skills training approaches were effective in improving engagement in employment. The other review found threats to force participation in employment-related activity were effective in reducing the number of people receiving unemployment-related welfare, but there was no evidence these people had found employment. For reviews of employment conditions, there was evidence that shared social activities in the workplace and resilience and stress training interventions were effective.

The reviews of childhood trauma revealed classroom-based interventions, using a wide range of intervention types, were effective in reducing PTSD and other symptoms for children affected by large-scale events (such as natural disasters). There was some evidence that interventions had stronger effects when delivered by therapists, but those delivered by classroom teachers were also effective.

Reviews of housing and homelessness interventions did not reveal strong evidence but suggested that for interventions to be effective they needed to be ongoing and include case management when high-risk population groups were involved.

Finally, few income inequality interventions were identified that were delivered at scale. These tended to be welfare-to-work type interventions, which had a small effect at times in getting people off welfare but created other stressors that then affected wellbeing and tended to have little impact on income.

Overall, this Evidence Check found limited evidence of effective programs delivered at scale to address these specific risk and protective factors. Social support interventions, delivered online, show promise, in terms of being delivered in an accessible way to large population groups. Interventions to address workplace factors, such as stress, interpersonal relations and job demands, appear to be effective, and can be delivered at scale directly to the targeted population groups. Similarly, schools provide an effective and accessible setting for the delivery of at scale interventions to address trauma associated with large-scale events (natural events or violent events witnessed by many people) and the trauma experienced by young people who are refugees or seeking asylum. Housing interventions also show promise not only for increasing housing stability and reducing homelessness, but also for reducing mental health problems. The Housing First intervention was the only at scale intervention that was evaluated in several different reviews and showed promise in terms of housing outcomes; however, one review indicates the program is not cost-effective. Employment programs also can be delivered at scale to people on employment-related welfare,

and we identified two reviews of employment programs that have been effective at increasing the skills of young people and increasing the number of young people successful in finding work.

We did not find any interventions that were effective in addressing income inequality or increasing the income of low-income people. Welfare-to-work programs were generally not shown to be effective in improving people's income level. While Active Labour Market programs and forced participation in employment-related activities were effective in reducing the number of people on employment-related welfare, there is no evidence that the people withdrawing from welfare-receipt found employment. There is very little synthesised research literature on the effectiveness of programs to improve income and the reviews that are available do not show these programs are effective.

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