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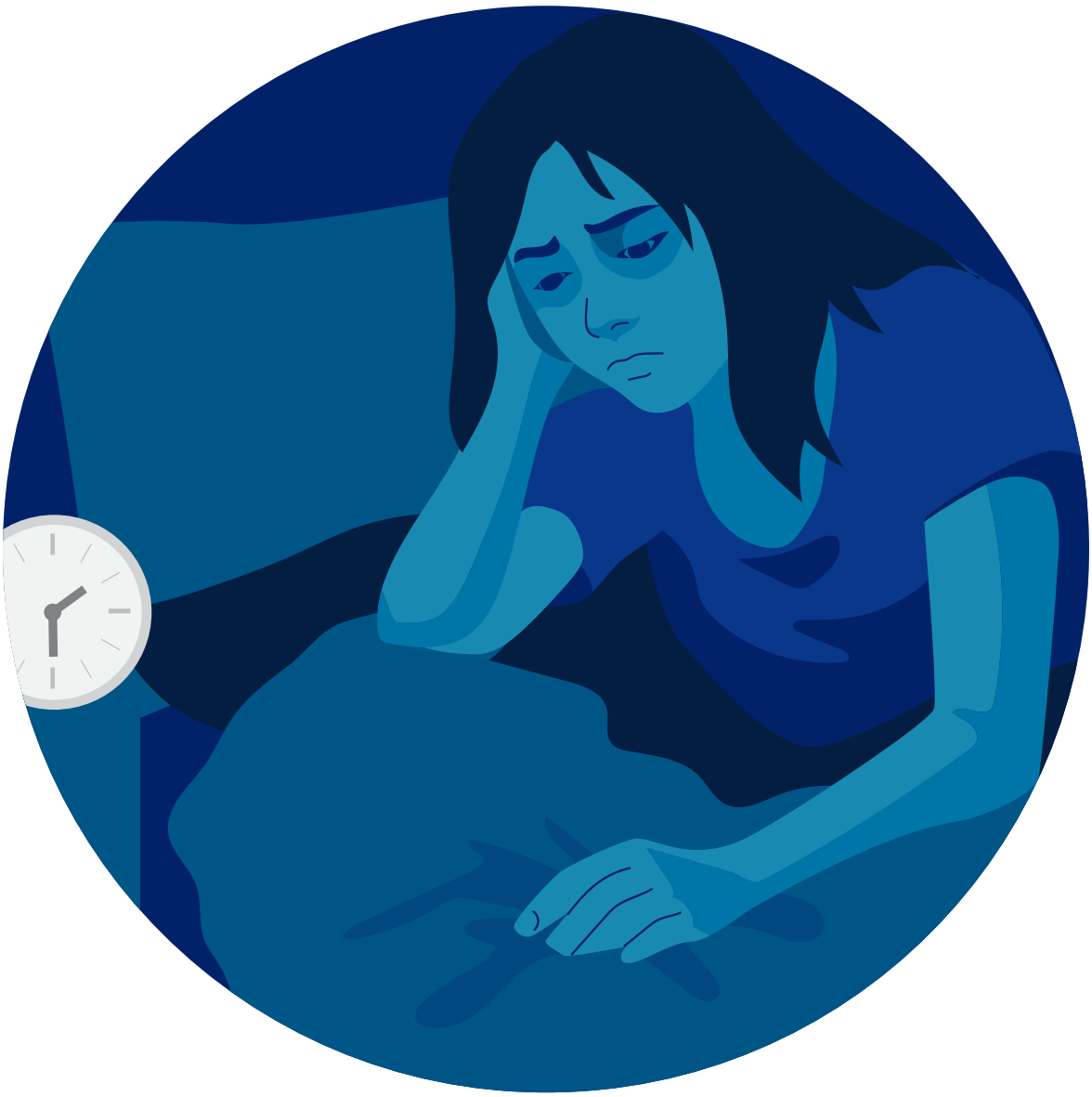

Sleep restored: The effectiveness of cognitive behavioural therapy for insomnia

Australasian Sleep Association

June 2026

Deloitte
Access Economics

Preface

Chronic insomnia is a prevalent and debilitating clinical sleep disorder in Australia that is associated with significant health and economic consequences. Approximately 30 per cent of adults experience acute insomnia symptoms, and an estimated 3.2 million Australian adults have chronic insomnia disorder at any given time.

Evidence-based insomnia management guidelines worldwide consistently recommend Cognitive Behavioural Therapy for insomnia (CBT-I) as the 'first line' treatment for insomnia. However, only 1 per cent of Australian adults with insomnia access CBT-I. Many people experience insomnia for multiple years and attempt numerous management approaches before accessing CBT-I.

Improving access and use of CBT-I is a priority of the Australasian Sleep Association. There are several evidence-based CBT-I modalities that differ in availability, resource requirements, patient preference and suitability, and profiles of effectiveness and benefit. This report describes the economic and societal costs and benefits of increasing access to CBT-I for adults with insomnia in Australia via clinicians with training and expertise in CBT-I delivery, and digital CBT-I programs.

The analysis demonstrates the considerable economic and social benefits of treating insomnia with CBT-I in Australia – generating an economic benefit of up to $3.67 for every dollar investment, with additional wellbeing benefits for individuals with insomnia. The report also highlights the importance of future policy opportunities to support the identification, management and prevention of insomnia in Australia which will lead to better outcomes for people living with insomnia.

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Contributions to this report

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Acknowledgement of Country

The Australasian Sleep Association recognises and pays respect to the traditional owners of the lands where we live and work – the Aboriginal and Torres Strait Islander peoples of Australia and Māori as tangata whenua (people of the land) of Aotearoa.

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Acronyms

Acronym	Full name
ABS	Australian Bureau of Statistics
ASA	Australasian Sleep Association
BCR	Benefit-cost ratio
BEACH	Bettering the Evaluation and Care of Health
CBA	Cost-benefit analysis
CBT	Cognitive behavioural therapy
CBT-I	Cognitive behavioural therapy for insomnia
DSM-5	Diagnostic and Statistical Manual of Mental Disorders
FTE	Full-time equivalent
GP	General practitioner
ICD-10	International Classification of Diseases Tenth Revision
ICER	Incremental cost-effectiveness ratio
ICSD	International Classification of Sleep Disorders
ICSD-3	International Classification of Sleep Disorders Third Edition
ISI	Insomnia severity index
MBS	Medicare Benefits Scheme
PBS	Pharmaceutical Benefits Scheme
PV	Present value
QALY	Quality-adjusted life year
RACGP	Royal Australian College of General Practitioners
UK	United Kingdom
US	United States

Key insights

Impact of insomnia

Insomnia impacts the lives of more than

1 in 7 Australians

or 14.8 per cent of the population aged 18 and over. In 2025, this was 3.2 million Australian adults.

What is chronic insomnia?

The International Classification of Sleep Disorders-3 (ICSD-3) definition of chronic insomnia involves a complaint of difficulties initiating and/or maintaining sleep and daytime impairment experienced on at least three nights per week and present for at least three months, with adequate sleep opportunity.[i]

People living with insomnia experience difficulties initiating or maintaining sleep. This has daytime consequences including:

- **Fatigue**
- **Poor mood**
- **Reduced productivity**

There are several treatment options for insomnia

Cognitive behavioural therapy for insomnia (CBT-I)	delivered by trained clinicians individually or in small group settings and in-person or via tele-health, or digital CBT-I programs (with or without clinician guidance)
Pharmacotherapy	sedative hypnotic medications accessed over the counter or by prescription
Third-wave therapies	psychological and behavioural treatments such as mindfulness-based treatment and acceptance commitment therapy

CBT-I is the recommended first line treatment for insomnia but is highly underutilised and **less than 1 per cent** of Australians living with insomnia access it.

Expanding access to CBT-I to 100,000 Australian adults over 5 years is highly cost effective:

Costs

Total incremental cost of delivering CBT-I is estimated to be

$40.8 million

(present value), or

$306 per person
for digital CBT-I

$2,023 per person
per person for clinician-delivered CBT-I

Benefits

Total economic benefits are estimated to be

$149.7 million

including:

- Avoided health system costs (general practitioner (GP) encounters, hospital admissions, allied health and sleep physician referrals)
- Avoided productivity losses (absenteeism, presenteeism, and reduced employment)

Net economic benefit

This will deliver a net economic benefit of

$108.9 million

or $1,089 per person

The economic benefit cost-ratio of expanding CBT-I access is **3.67**, meaning that $3.67 would be generated for every $1 invested into it

Incremental cost effectiveness

Digital CBT-I cost of **$4,872** per Quality-Adjusted Life Year (QALY) gained

Clinician delivered CBT-I cost of **$28,922** per QALY gained.

Future opportunities

There is an opportunity to support better outcomes for people living with insomnia through improved access to CBT-I. This includes:

- Upskilling the available workforce to deliver CBT-I
- Increasing awareness of CBT-I among frontline care providers
- Develop funding pathways to increase the uptake of CBT-I
- Delivering public health awareness and education campaigns to highlight the importance of insomnia and preventative sleep health
- Introducing routine insomnia screening in primary care

[i] Defined as adequate time in bed for sleep, in the absence of external/environmental interruptions (e.g. caring responsibilities, noise, inadequate time in bed due to work commitments).

Executive summary

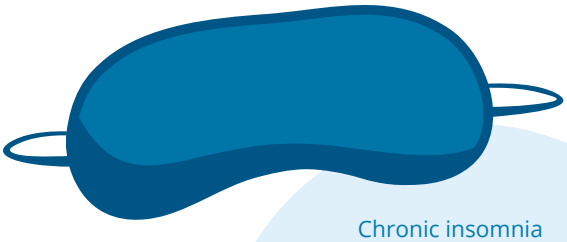
Background

Chronic insomnia is a common sleep disorder, affecting more than 1 in 7 Australians, or around 3.2 million Australian adults (15 per cent), in 2025.[1] People living with insomnia have frequent difficulty falling or staying asleep, and experience daytime effects such as fatigue, reduced mood and reduced productivity. In 2019-20, it was estimated that insomnia cost the Australian economy $19.1 billion in social and economic costs.[2] These costs include costs to the health system, productivity losses and reduced wellbeing.

Deloitte Access Economics was engaged by the Australasian Sleep Association (ASA) to estimate the potential costs and benefits of expanding access to one therapeutic pathway for insomnia – cognitive behavioural therapy for insomnia (CBT-I) – in Australia. In estimating the potential costs and benefits, the effectiveness between digital and clinician-delivered CBT-I was to be compared for a specified target population of 100,000 adults in Australia over a five-year period, relative to a counterfactual of current treatment options.

What is chronic insomnia?

People living with insomnia experience frequent difficulties initiating or maintaining sleep, not attributable to inadequate opportunities for sleep. Insomnia can present as acute (less than three months) and chronic (at least three months). This report is based on the International Classification of Sleep Disorders Third Edition (ICSD-3) definition of chronic insomnia, which describes a self-reported complaint of sleep symptoms and daytime impairment experienced greater than (or equal to) three nights per week and present for at least three months, with adequate sleep opportunity.[ii] Acute insomnia may be initially triggered by acute stress, shift work, frequent travel, physical illness, medication use, chronic pain, or mental health conditions such as anxiety and depression.[3] However, insomnia can rapidly develop functional independence from these triggering factors, and become a self-maintaining chronic condition. Consequently, chronic insomnia often requires targeted treatments, regardless of the presence or absence of initial triggering factors.



Chronic insomnia affects more than

1 in 7

Australians

or around 3.2 million Australian adults (**14.8 per cent**), in 2025.

[ii] Defined as adequate time in bed for sleep, in the absence of external/environmental interruptions (e.g. caring responsibilities, noise, inadequate time in bed due to work commitments).

Treatment for insomnia in Australia

Several treatment options for insomnia are available, ranging from lifestyle changes and education about healthy sleep habits to CBT-I and, in many cases, pharmacotherapy.[4] The availability, effectiveness and longevity of treatment benefits vary considerably, depending on the treatment option.

Pharmacotherapy

In Australia, treatment for insomnia is commonly delivered in primary care and frequently involves pharmacotherapy – i.e., the use of prescription or over-the-counter sedative hypnotic medications to treat insomnia.[5] Prescription medicines are commonly used to assist with sleep initiation and maintenance and include benzodiazepines, 'Z-drugs', melatonin and other sedative agents. While pharmacotherapy can provide immediate symptom relief and improve sleep onset and duration in the short-term, it does not address the underlying cause of insomnia and can lead to increased health care utilisation, cognitive and psychomotor side effects, falls, and fractures in certain populations.

Recommendations about healthy sleep habits

Many people with insomnia access recommendations about healthy sleep habits (also called 'Sleep Hygiene') online or from a healthcare professional. Recommendations about healthy sleep habits are different from CBT-I. Healthy sleep habits often include generic recommendations about daytime, evening, and overnight behaviours and environmental factors that can impact sleep (e.g., avoiding caffeine in the late afternoon and evening; removing any television and electronics from the bedroom; consider noise, temperature and light in the bedroom environment).[6,7] Although healthy sleep habits are readily available, they are not recommended as an effective intervention for chronic insomnia.[8]

Cognitive behavioural therapy for insomnia

CBT-I is recognised internationally and in Australia as the first line treatment of insomnia.[9] CBT-I is a structured, evidence-based multi-component non-drug intervention that aims to help individuals identify and modify negative thoughts and behaviours that perpetuate sleep disturbance. It can involve education about sleep and insomnia, stimulus control therapy, bedtime restriction therapy (limiting time spent awake in bed), relaxation training, cognitive restructuring (challenging unhelpful beliefs) and relapse prevention strategies. Delivered by clinicians or digital platforms, CBT-I can produce sustained improvements in sleep outcomes, associated daytime functioning and mental health.[10]

Despite strong evidence of reducing insomnia severity, CBT-I is significantly underutilised in Australia with only 1 per cent of people living with insomnia receiving the treatment.[11] This underutilisation is believed to be driven by low awareness of CBT-I among primary care clinicians and patients, high out of pocket costs for CBT-I and low availability of clinicians with training and expertise in CBT-I. These barriers to CBT-I may contribute to many patients accessing sedative hypnotic medications which are not recommended as 'first line' treatment and are less effective and more costly than CBT-I in the long term.

In recent years, digital CBT-I has emerged as a scalable and accessible treatment option that may help overcome some of the barriers driving underutilisation of CBT-I, with effect sizes comparable to clinician-delivered CBT-I at a relatively lower cost.[12, 13, 14] In Australia, there are several evidence based digital CBT-I programs, such as This Way Up,[iii] Bedtime Window,[iv] The Sleep Course[v] and A Mindful Way.[vi, 15, 16]

There are several CBT-I modalities, including individualised and group-based interventions delivered in-person or via tele-health by clinicians (including psychologists), self-guided and clinician-guided digital CBT-I programs, and self-guided booklets/text-based CBT-I interventions. For this report, clinician-delivered CBT-I and self-guided digital CBT-I are selected, based on the larger amount of scientific data.

[iii] This Way Up is a 4-lesson online digital CBT-I program that can be completed alone or with clinician support. It is designed to be completed within two months.

[iv] Bedtime Window is an interactive 5-session digital CBT-I program consisting of weekly 20–30-minute sessions containing images, videos, text information and tailored downloadable resources. Recommendations are tailored according to individuals' unique sleep, wake and lifestyle patterns. Bedtime Window has been co-designed by GPs and patients and has demonstrated large and sustained improvements across multiple randomised controlled trials.

[v] The Sleep Course is an online 8-week treatment course to help individuals understand how sleep works and learn practical, evidence-based skills to improve sleep.

[vi] A Mindful Way is a 6-week online self-help program based on CBT-I and mindfulness training. It includes weekly online interactive 2-hour modules that individuals can do at their own pace, readings, meditation recording and weekly quizzes.

Approach to this report

The purpose of this analysis is to evaluate the expansion of access to CBT-I, with the capacity to deliver this therapy to an assumed cohort of 100,000 individuals living with insomnia within the target population. The effectiveness of CBT-I in avoiding costs and improving wellbeing was estimated using cost-benefit analysis (CBA) and cost-effectiveness methodologies, leveraging cost-of-illness studies and available literature on treatment effectiveness.

The framework and methodology used was co-designed with the Project Advisory Group and assessed the costs and benefits of CBT-I intervention. In the analysis, the intervention scenario was compared with a counterfactual scenario to determine the incremental costs and benefits. Specifically, the:

Intervention scenario represents individuals receiving either digital or clinician-delivered CBT-I.

Counterfactual scenario represents individuals who remain untreated or receive pharmacotherapy.

While delivering CBT-I will require an upfront investment to expand availability and access, both CBT-I delivery modes are shown to reduce insomnia symptoms, leading to cost savings and improvements in wellbeing.

The modelling drew on multiple data sources, including publicly available data from the Australian Bureau of Statistics (ABS), Medicare Benefits Scheme (MBS) and Pharmaceutical Benefits Scheme (PBS), research evidence and literature, including Bettering the Evaluation and Care of Health (BEACH) data, MedicineInsight data, data provided by insomnia management clinical organisations and research programs in Australia and previous Deloitte Access Economics reports analysing economic and social cost of sleep disorders, including insomnia.

The analysis estimated the following costs of intervention (and counterfactual) scenarios:

- **Upfront investment costs**, that included digital investment and set-up costs, and training to accredit clinicians (e.g. psychologists) to deliver CBT-I
- **Service delivery costs**, that included staffing support such as clinicians, project management and IT support, annual promotion and digital maintenance costs, overhead costs
- **Out of pocket costs** for individuals accessing CBT-I
- **Cost of time** for individuals to access and receive CBT-I.

The analysis assessed these costs against the following benefits:

- **Avoided health system costs**, that included reduced hospital admissions and medical expenses for general practitioner, specialist and allied health professional visits
- **Productivity gains**, that included avoided absenteeism and presenteeism, and avoided lost employment opportunities
- **Wellbeing improvements**, that included reduced years of healthy life lost due to morbidity, reduced years of life lost to premature death and improved quality of life due to conditions attributable to insomnia.

Each benefit considered the direct benefits of improving insomnia symptoms and indirect benefits of its consequences on directly attributable conditions (e.g., depression).

Results

Delivering CBT-I to 100,000 individuals with insomnia over five years is estimated to cost $31.9 million and provide the total avoided economic benefit of $149.7 million, with majority of these benefits (93.4 per cent) derived from avoided productivity losses.[vii, 18] After accounting for intervention costs, this yields a net benefit of $117.8 million over five years, or $1,089 per person, reflecting a benefit-cost ratio (BCR) of 3.67. Up to $3.67 of economic benefits could be generated for each dollar invested, representing a significant and positive economic benefit and demonstrating the cost effectiveness of expanding access to CBT-I. The results are consistent with findings from other studies in the research literature evaluating internet-delivered CBT-I.[19]

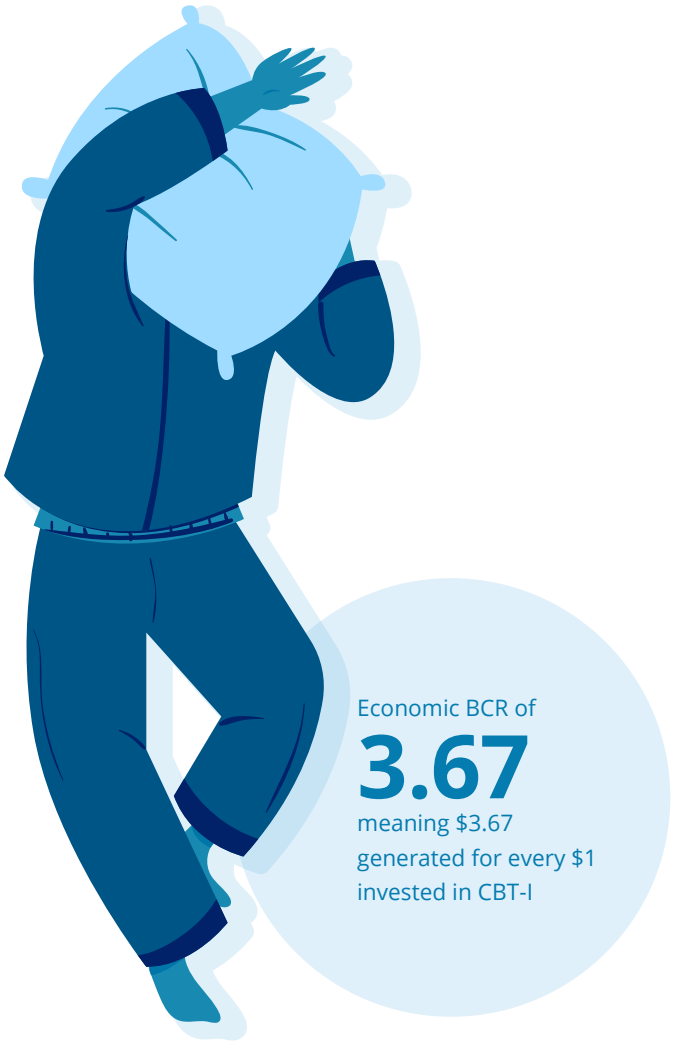


Figure i: Economic cost-benefit analysis results ($ millions, Present Value (PV))

Core scenario: CBT-I compared to counterfactual where individuals receive pharmacotherapy or no treatment

Present value benefits

(Present value benefits represents the total economic benefit before accounting for intervention costs to deliver CBT-I)

- **$9.9** Avoided health system costs
- **$139.7** Avoided productivity losses
- **$149.7** Total avoided economic costs of insomnia

−

Present value costs

- **$40.8** Total intervention cost

=

Present value net economic benefit

- **$108.9** Net present value
- **3.67** Benefit-cost ratio (BCR)

Source: Deloitte Access Economics (2026).
Note: Total intervention cost refers to the incremental cost to deliver CBT-I relative to the counterfactual scenario.

[vii] The split between avoided productivity and health system costs reflects the relative distribution of cost categories in the 2021 Deloitte Access Economics report on the social and economic cost of sleep disorders in Australia.

Expanding CBT-I access would cost approximately $665 per person on average, with costs varying depending on the delivery modality. The higher cost of clinician-delivered CBT-I is primarily driven by the intensity of clinician time required to deliver the program. Digital delivery would cost substantially less compared to clinician-delivered CBT-I as it provides opportunity for some economies of scale where patients self-guide through the treatment and a clinician oversees multiple patients.

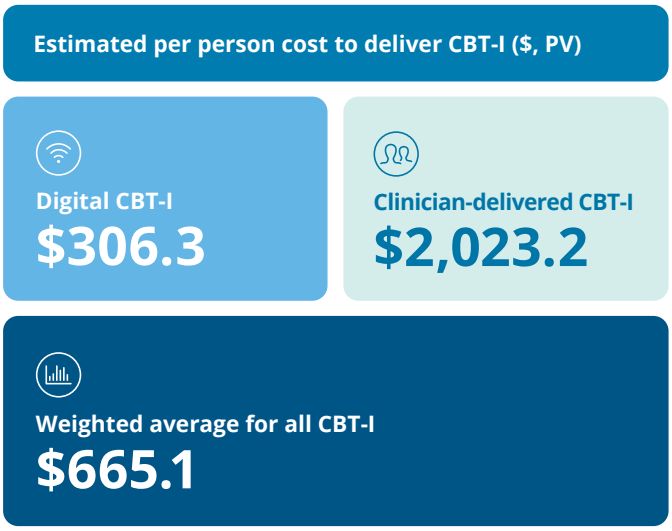
In addition to economic benefits, CBT-I could generate an additional $460.2 million in avoided wellbeing losses over five years. Approximately 21.4 per cent of these avoided wellbeing losses would be due to conditions directly attributable to insomnia rather than insomnia itself. This means that mental health conditions such as depression and anxiety, disorders such as alcohol and substance abuse and workplace injuries arising in an individual because of their insomnia would be reduced, decreasing the degree of wellbeing loss associated with insomnia.

Given the improvements to wellbeing such as improved daily functioning and reduced fatigue, CBT-I is a highly cost-effective initiative with respect to improving the quality of life. The incremental cost effectiveness ratio (ICER) for digital CBT-I $4,872 (see Table iii). This means to achieve one QALY through digital CBT-I, a $4,872 investment would be required, compared to $28,922 of investment for clinician-delivered CBT-I.

While the effectiveness of both modalities in reducing insomnia symptoms is similar, the cost to provide clinician-delivered CBT-I is much higher. The benchmark for assessing the efficiency of new treatments in Australia is recognised to be $50,000 per QALY gained.[20] In this context, both digital and clinician-delivered CBT-I are considered highly cost effective.

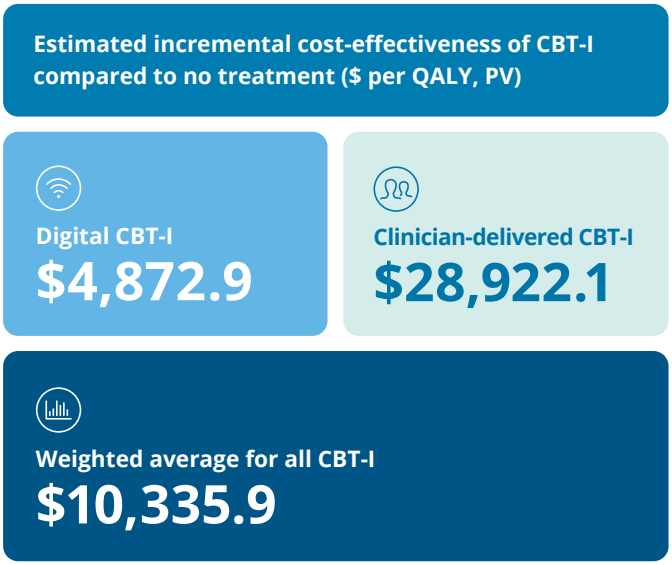
Additional benefits such as reduced stress on families, improved caregiver capacity, increased social and community engagement and long-term prevention of chronic conditions could also be realised.[21, 22, 23, 24, 25]

Figure ii: Estimated per-person cost to deliver CBT-I ($, PV)



Source: Deloitte Access Economics (2026). Assumes that 80% of patients access digital CBT-I, and 20% access clinician-delivered CBT-I.

Figure iii: Estimated incremental cost-effectiveness of CBT-I compared to no treatment ($ per QALY, PV)



Source: Deloitte Access Economics (2026). Assumes that 80% of patients access digital CBT-I, and 20% access clinician-delivered CBT-I.

Considerations in interpreting the results

In estimating the potential costs and benefits of expanded access to CBT-I, there were a number of considerations to the approach that inform how the results are interpreted, including:

- **Pharmacotherapy use in the counterfactual** – Data on the pattern of prescription and over the counter pharmacotherapy use and its impact on insomnia symptoms and broader wellbeing (including adverse effects over time) in the counterfactual is limited. In reality, use of pharmacotherapy is highly variable between individuals.
- **Complexity of treatment received** – In reality, many individuals entering the intervention who have previously been on pharmacotherapy may experience a transition period where they gradually reduce use of medication. For the purposes of this analysis, individuals do not receive both CBT-I and pharmacotherapy at any one time.
- **Time horizon of benefits** – The time horizon has been restricted to five years however benefits of CBT-I may persist beyond this, with some studies demonstrating benefits up to 10 years post treatment.[26] This means the benefits may be greater than that reported.
- **CBT-I workforce capacity** – This analysis assumes there is sufficient capacity within the existing psychologist clinical workforce to access and be trained in CBT-I to meet demand of the target population. In actuality, insufficient supply of clinicians to deliver CBT-I to the target population would necessitate additional costs to upskill individuals (e.g., psychology university degrees).
- **Financial return of benefits** – While real economic gains measured in this analysis are reported in dollar values, they may not necessarily materialise as cash savings. Further, some returns may be delayed relative to when costs are incurred.

Future opportunities

This report demonstrates the considerable economic and social benefits of treating insomnia with CBT-I in Australia. The findings presented in this report aim to demonstrate the potential impact of expanding access to CBT-I. The report also highlights the importance of a number of future policy opportunities to support the identification, management and prevention of insomnia in Australia. These include:

Each of these presents an opportunity for future work to increase the utilisation of CBT-I as a recommended first line treatment for insomnia, leading to better outcomes for people living with insomnia. These future opportunities will require careful planning and evaluation to ensure that they achieve the intended outcomes.

Upskill the available workforce capable of delivering CBT-I

Increase awareness of CBT-I among frontline care providers

Develop funding pathways to increase the uptake of CBT-I

Deliver public health awareness and education campaigns to highlight the importance of insomnia access to CBT-I

Introduce routine insomnia screening in primary care to increase the rate of insomnia diagnosis and identify undiagnosed individuals.

1

Introduction

Chronic insomnia affects more than 1 in 7 Australians but effective treatment options for the sleep disorder are underutilised. This report considers the costs and benefits of cognitive behavioural therapy for insomnia.

This chapter outlines the impact of insomnia and treatment options available to individuals in Australia.

1.1 Insomnia

Chronic insomnia is a widespread sleep disorder that impacts the lives of more than 1 in 7 Australians. People living with insomnia experience difficulties initiating and/or maintaining sleep, not attributable to environmental circumstances or inadequate opportunities for sleep. These difficulties with sleep are associated with daytime consequences such as fatigue, reduced mood and reduced productivity, creating a high burden of disease.

Insomnia continues to present substantial social and economic impacts and has been estimated to cost the Australian economy $19.1 billion in the 2019–20 financial year as quantified in previous Deloitte Access Economics' report *Rise and try to shine: the social and economic cost of sleep disorders in Australia.*[27] Direct health care system costs associated with insomnia include hospital services, out of hospital medical expenses, prescription pharmaceuticals and other costs related to ongoing management of the condition. Productivity losses due to insomnia are also significant, with impacts from reduced workforce participation, absenteeism and presenteeism. The most substantial burden of insomnia stems from wellbeing losses incurred by individuals living with insomnia, estimated to amount to $13.2 billion in costs (69 per cent of all costs associated with insomnia). Other reports including *Asleep on the job: The costs of inadequate sleep in Australia* and *Reawakening Australia: The economic cost of sleep disorders in Australia* by Deloitte Access Economics,[28,29] and *Wake up Australia: The value of health sleep* by Access Economics[30] have demonstrated the cost of inadequate sleep, to which insomnia contributes, is as high as $66.3 billion (2016-17).

Without appropriate and timely treatment, chronic insomnia can persist for many years, increasing its clinical and economic burden. Delayed treatment or late intervention can prolong symptom duration and increase the risk of developing or exacerbating comorbid conditions, particularly mental health disorders such as anxiety and depression, alcohol and substance abuse disorders, dementia and cognitive decline in older adults.[31, 32, 33, 34, 35]

1.1.1 Definition of insomnia

Insomnia is a sleep disorder characterised by self-reported difficulty in falling asleep and/or maintaining sleep. It is accompanied by daytime impairment, including fatigue, impaired concentration and memory, mood disturbance, irritability, and reduced occupational and social functioning. Insomnia can present in different forms, including:

- **Acute insomnia** – a common, short term sleep disorder lasting less than three months, often triggered by stress or environmental factors.[36] Acute insomnia often resolves on its own without treatment.
- **Chronic insomnia disorder** – a long-term pattern of sleep disturbance with symptoms persistence for at least three months, occurring at least three nights per week. Chronic insomnia may present with different symptom profiles, including difficulty falling asleep (sleep-onset insomnia), difficulty staying asleep (sleep maintenance insomnia) or early morning awakening.[37] Chronic insomnia may continue independently of external triggers due to behavioural and cognitive mechanisms that maintain sleep disturbance.[38]

Insomnia disorder is defined in multiple diagnostic schema, including the Diagnostic and Statistical Manual of Mental Disorders Fifth Edition (DSM-5), the International Classification of Sleep Disorders Third Edition (ICSD-3), and the International Classification of Diseases Tenth Revision (ICD-10).

This report uses the ICSD-3 definition of insomnia, which describes a self-reported complaint of sleep symptoms and daytime impairment experienced greater than (or equal to) three nights per week and present for at least three months, with adequate sleep opportunity.[viii] These sleep issues cause significant distress or functional impairment and are not better explained by other sleep-wake disorders (e.g., obstructive sleep apnoea). No overnight sleep study is required for a diagnosis of insomnia. Important qualifiers to this definition include that a diagnosis of insomnia can be made even it co-exists with other medical or psychiatric conditions. There is evidence that insomnia can be treated in the presence of many comorbid chronic conditions, and that improving sleep can have positive down-stream impacts on management of comorbid disorders (e.g. depression, anxiety, sleep apnoea).[39, 40, 41] Therefore, chronic insomnia should be considered as a comorbid 'insomnia disorder' rather than a 'secondary symptom' when co-occurring with other conditions.

1.1.2 Risk factors for insomnia

Several factors contribute to the development and persistence of insomnia, varying between individuals. Insomnia may be initially triggered by acute stress, shift work, frequent travel, physical illness, medication use, chronic pain, or mental health conditions such as anxiety and depression.[42] Certain populations are at increased risk of insomnia, including older adults as sleep typically becomes lighter and more fragmented with age. People living with comorbid chronic disease are also at greater risk, as are shift workers where disruption to the circadian rhythm can impair sleep regulation.[43]

1.1.3 Measuring the Severity of Insomnia

The severity of insomnia is often classified using the Insomnia Severity Index (ISI). The ISI is a brief screening tool for insomnia, using a seven-item questionnaire to categorise symptoms from subthreshold levels to severe levels which result in frequent, severe sleep disturbances that cause significant disruption to daily life.[44] Symptoms are categorised across a 28-point scale, which can be divided into thresholds including; no clinically significant insomnia (0-7), subthreshold (mild) insomnia (8-14), moderately severe insomnia (15-21), and severe insomnia (22-28). Questions relate to subjective qualities of the respondent's sleep including symptom severity, satisfaction with sleep patterns, impact on daily functioning and overall level of distress created by the sleep problem.[45]

Treating insomnia with medication does not address the underlying causes of chronic insomnia, which are often psychological and behavioural in nature.

1.2 Treatment for insomnia in Australia

Treatment options for insomnia range from lifestyle changes and improving education about healthy sleep habits to cognitive-behavioural therapy (CBT), mindfulness-based and acceptance-commitment therapies and, in many cases, prescription and over the counter pharmacotherapy.[46] While multiple treatment options are available, their effectiveness, persistence of benefits and long-term usability vary considerably.

1.2.1 Education about healthy sleep behaviours

Education about healthy sleep behaviours (also referred to as 'Sleep hygiene') aim to promote healthy behaviours and environmental conditions that support quality sleep. Examples include limiting caffeine consumption in the afternoon/evening, timing of meals and physical activity, recommendations to avoid electronics in the bedroom, modify bedroom light/noise/temperature to facilitate sleep, and recommendations to avoid long daytime naps.[47,48] While education about healthy sleep habits is widely provided in clinical practice, and information is readily available online, evidence indicates that it is unlikely to be effective as a standalone treatment for chronic insomnia.[49]

1.2.2 Pharmacotherapy

In Australia, treatment for insomnia is commonly delivered in primary care and frequently involves pharmacotherapy – i.e., the use of sedative hypnotic medications to treat insomnia.[50] Prescription medicines are commonly used in clinical practice to assist with sleep initiation and maintenance and include benzodiazepines, 'Z-drugs' (including zolpidem and zopiclone), melatonin and other sedative agents. There are also several over the counter medicines that people with insomnia use to self-manage sleep problems (e.g., sedating-antihistamines, herbal products, etc.). Antidepressant and antipsychotic medicines are also prescribed 'off label' for insomnia management, despite limited evidence of effectiveness, and guideline recommendations that these medicines are not indicated for insomnia management.

Prescription pharmacotherapy can provide rapid symptom relief and be effective in improving sleep onset and duration in the short-term. However, treating insomnia with medication does not address the underlying causes of chronic insomnia, which are often psychological and behavioural in nature. Further, clinical guidelines generally recommend pharmacotherapy for short-term use only. This is due to risks including daytime drowsiness, memory impairment and dependence associated with long-term use. When used for longer duration, initial therapeutic benefits from pharmacotherapy can become replaced with patterns of dependence and experiences of withdrawal/rebound insomnia

[viii] Defined as adequate time in bed for sleep, in the absence of external/environmental interruptions (e.g., caring responsibilities, noise, inadequate time in bed due to work commitments).

symptoms upon dose reduction. As such, pharmacotherapy for insomnia is generally not recommended beyond 2-4 weeks. Some studies have also identified that prolonged use of sedative-hypnotic is associated with a higher risk of dependence and overdose, increased rates of psychiatric disorders, particularly bipolar disorder and greater health care utilisation, often due to cognitive and psychomotor side effects.[51, 52, 53, 54, 55, 56, 57] Moreover, while sleep medications may improve sleep outcomes during active treatment, benefits generally do not persist beyond the treatment period once treatment ceases.

1.2.3 Cognitive behavioural therapy for insomnia

CBT-I is recognised internationally and in Australia as the first line treatment of insomnia.[58] Cognitive behavioural therapy for insomnia (CBT-I) can help individuals identify and modify negative thoughts and behaviours that perpetuate insomnia. This produces sustained improvements in sleep outcomes and associated daytime functioning.[59] Hundreds of clinical trials and over 40 meta-analyses have demonstrated the effectiveness of CBT-I on different outcomes, in different delivery formats, and in specific populations.[60]

Core components of CBT-I include education about sleep and insomnia, stimulus control therapy, bedtime restriction therapy (limiting time spent awake in bed), relaxation training, cognitive restructuring (challenging unhelpful beliefs about sleep), and relapse prevention strategies. Treatment can be delivered via multiple modes, including via clinician delivery (face-to-face or via telehealth) or through digital platforms, making CBT-I adaptable to different patient needs and settings. The intensity of CBT-I covers a broad spectrum of delivery, ranging from in-person and individualized sessions with a clinician to 'static' self-guided programs, and highly interactive and personalised digital interventions where patient-entered information is used by underlying algorithms to guide treatment recommendations and personalisation.

Delivery of CBT-I

Clinician-delivered CBT-I is most commonly provided by psychologists or other trained health professionals with specific training and expertise in insomnia management. Treatment can be delivered in individual or group settings and typically involves over 6-8 sessions, although this may vary depending on symptom severity and comorbidities.[61] Evidence from randomised controlled trials and meta-analyses demonstrate that clinician-delivered CBT-I improves sleep onset latency, wake after sleep onset, total sleep time, sleep quality, daytime function and associated mental health symptoms (depression, anxiety), with effects generally well sustained over time. CBT-I has been shown to improve insomnia symptoms in up to 80 per cent of affected people, with 40 per cent of people also reducing or ceasing the use of sleep medications entirely.[62, 63] Evidence also suggests that CBT-I is effective for insomnia co-occurring with other chronic conditions such as mental health issues like depression, anxiety and post-traumatic stress disorder, as well as other health conditions like cancer, pain and obstructive sleep apnoea.[64, 65]

Adoption of CBT-I in Australia

Despite strong evidence of effectiveness, CBT-I is significantly underutilised in Australia with only 1 per cent of people living with insomnia receiving the treatment.[66, 67] This underutilisation is driven by several barriers, including:

- **Low awareness:** there is limited awareness among health professionals and people with insomnia that CBT-I is the recommended first-line treatment for insomnia, and often CBT-I is conflated with simple sleep education factsheets (e.g., sleep hygiene). This contributes to low rates of appropriate patient referral.[68, 69, 70]
- **Limited workforce:** the number of trained practitioners is limited, particularly in regional and remote communities
- **Out-of-pocket costs:** there can be high out-of-pocket costs of accessing CBT-I, especially when CBT-I is delivered in specialist settings (MBS Better Access initiative rebates are available, but a private co-payment is often required to access clinician-delivered CBT-I)[71, 72]
- **Limited funding for digital CBT-I:** while evidence-based digital CBT-I programs are available in Australia, access is constrained by limited reimbursement and funding pathways for patients
- **Poor referral pathways:** there are inadequate referral pathways for complex and chronic insomnia, meaning primary care clinicians are unclear on who to refer individuals to, or alternatively, no referral pathways exist as trained CBT-I clinicians are not readily available[73]
- **Long wait times:** accessing CBT-I in specialist settings can incur long delays (based on availability of the limited number of clinicians)
- **Primary care constraints:** time and resources in primary care to deliver CBT-I are limited[74]
- **Misconceptions:** there is a perception that insomnia is not a stand-alone treatment priority and it is alternatively treated as a secondary priority or symptom to other comorbid medical conditions.[75,76]
- **Time and effort burden:** ongoing effort and changes to daily routine associated with CBT-I can be perceived by individuals to be more burdensome and less convenient when compared to other treatments such as pharmacotherapy.[77]

These barriers often result in patients being prescribed sedative-hypnotic medications which are costly and may lead to adverse

effects, including increased risk of hospitalisation and patterns of long-term dependence.[ix] It is estimated that over 90 per cent of individuals presenting with insomnia symptoms receive pharmacotherapy treatment following a consult with a general practitioner.[78] Alternatively, some individuals opt to manage their sleep problems on their own without the support of a health professional.[79] This can include the use of herbal remedies, over-the-counter medications and lifestyle changes.

In recent years, digital CBT-I has emerged as a scalable and accessible treatment option that may help overcome some of these barriers.[80] In Australia, there are several digital CBT-I programs with emerging evidence supporting their effectiveness.[81] This has aligned with trends towards digital delivery of health services more broadly.[82] Digital CBT-I programs deliver the core components of CBT-I through web-based platforms or mobile apps, with varying levels of clinician guidance. Digital CBT-I programs differ in; self-guided versus clinician-guided delivery, cost to users, static versus interactive delivery, inclusion of algorithms to guide personalised recommendations, program duration (number of sessions and length of sessions), and specific CBT-I components included. Each of these factors may be associated with different patterns of effectiveness, completion rates, and resource costs (e.g., degree of automation vs clinician involvement). Research in Australia, the United States (US), United Kingdom (UK) and other jurisdictions indicates that digital CBT-I can achieve clinically meaningful improvements in sleep outcomes for people living with insomnia, with effect sizes comparable to face-to-face clinician delivery at a relatively lower cost.[83, 84, 85]

1.3 This engagement

The Australasian Sleep Association (ASA) is the peak scientific body in Australia and New Zealand representing clinicians, scientists and researchers working in sleep health and sleep medicine. Deloitte Access Economics was engaged by the ASA to estimate the potential costs and benefits of expanding access to CBT-I in Australia. The analysis aims to educate and inform a variety of stakeholders including the health care sector, the media, governments and the general public about the economic consequences of insomnia, its impact on wellbeing, and the potential for CBT-I to mitigate these impacts.

This report incorporates the latest evidence on the effectiveness of CBT-I and assesses the expansion of the access to CBT-I to 100,000 individuals living with insomnia. The methodology was developed and tested with a Project Advisory Group comprising sleep clinicians and researchers who provided advice, data and insights based on current research. The rest of this report is structured as follows:

- **Chapter 2** outlines the prevalence of insomnia in Australia
- **Chapter 3** presents the approach to modelling the effectiveness of CBT-I
- **Chapter 3** presents the results of estimating the impact of expanding access to CBT-I in Australia
- **Chapter 4** discusses the potential policy responses which may be used to better manage, treat and prevent insomnia
- **Appendix A** provides technical methodology notes regarding the approach to the analysis
- **Appendix B** provides the results of sensitivity analysis.

[ix] Defined as adequate time in bed for sleep, in the absence of external/environmental interruptions (e.g., caring responsibilities, noise, inadequate time in bed due to work commitments).

2

Prevalence of insomnia

Chronic insomnia affected approximately 3.2 million Australian adults in 2025, representing 14.8 per cent of the population aged 18 and over.

This section presents the estimated prevalence of chronic insomnia in Australia in 2025. Prevalence is presented by age and sex to highlight how insomnia typically presents and which cohorts are most affected.

2.1 Population prevalence

The prevalence of insomnia reflects the proportion of people in Australia who report at least one frequent sleep symptom (like difficulty initiating and/or maintaining sleep), associated with impairment of daytime feeling/functioning and accompanied by adequate time in bed, consistent with the ICSD-3 definition (see section 1.1.1). It has been estimated by the Sleep Health Foundation that the adult population prevalence of chronic insomnia is 14.8 per cent.[86] In 2025, this meant an estimated cohort of 3.2 million Australian adults were living with chronic insomnia.

The prevalence of insomnia varies across geographic and socioeconomic groups. Overall, insomnia is associated with lower income, financial stress, unemployment and retirement in the Australian population.[87]

Insomnia symptoms are more commonly reported in metropolitan areas (17.1 per cent) than in rural and regional areas (13.5 per cent).[88] However, the distribution of clinicians with training in insomnia management does not reflect this prevalence by geography, with nearly four times as many clinicians per person with insomnia symptoms in metropolitan areas than in regional areas.[89] This means that individuals living outside major cities are likely to experience greater barriers to accessing clinician-delivered treatment for insomnia.

Prevalence

14.8% (3.2 million)

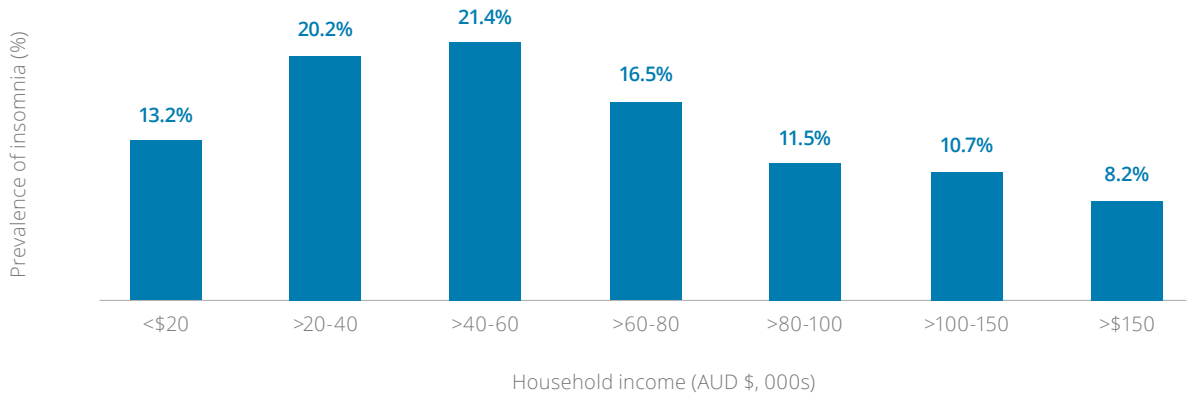
of the adult Australian population struggle with chronic insomnia

Source: Deloitte Access Economics calculations based on data from the Sleep Health Foundation Report, *Chronic Insomnia Disorder in Australia (2019).*

The prevalence of insomnia is also highest among low-income households, with 54.8 per cent of households with people living with insomnia reportedly earning under $60,000 per annum.[90] This may create a disproportionate financial barrier to treatment for the population most likely to experience insomnia.

Over time, the prevalence of insomnia in Australia is estimated to be increasing, with recent studies suggesting up to 41 per cent of Australians are experiencing at least one symptom of insomnia.[91] Rates are rising due to the lingering effects of the COVID-19 pandemic where sleep patterns changed during periods of lockdown, as well as the effects of social media, mobile phones and other distractions, particularly among young people.[92]

Chart 2.1: Prevalence of insomnia in Australia (%) by household income



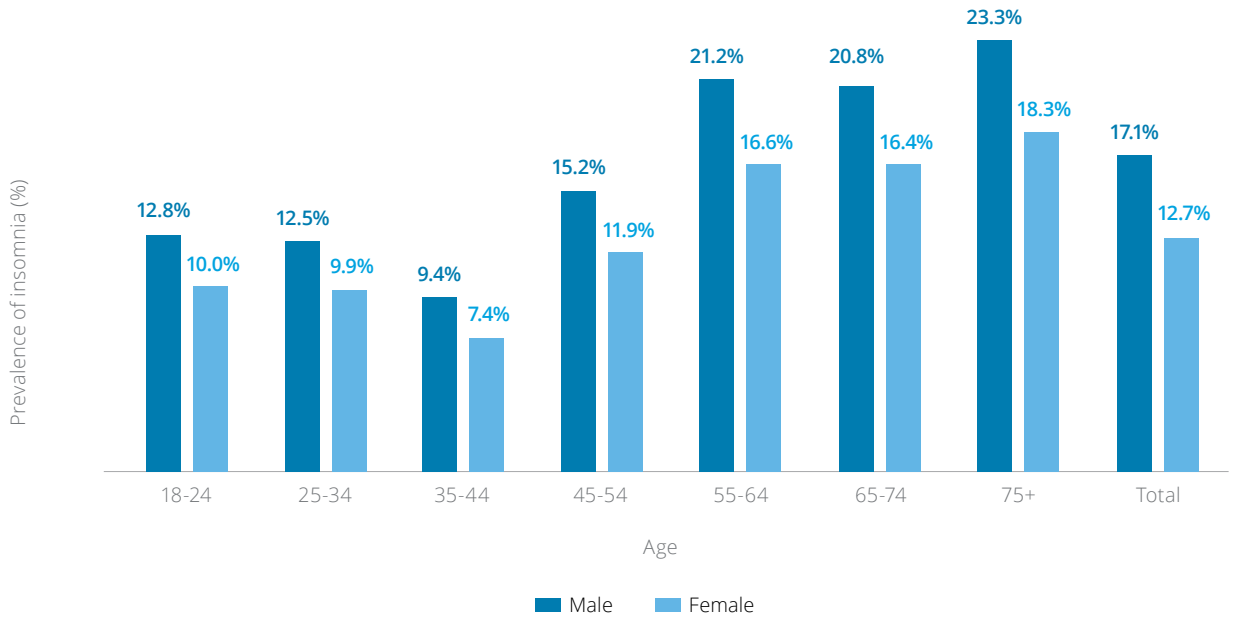
Source: Deloitte Access Economics calculations based on data from the Sleep Health Foundation Report, *Chronic Insomnia Disorder in Australia (2019).*

2.2 Prevalence by age and sex

The prevalence of insomnia may also vary across age and sex. Some studies have reported higher prevalence of insomnia in females than males.[93] The most up to date population-based data in Australia from the Sleep Health Foundation indicates that insomnia is more common in males than females, with prevalence of insomnia 17.1 per cent of all males compared to 12.7 per cent of females aged 18 and over.[94]

Certain age groups are also at higher risk of insomnia. Older adults have been shown to face a greater likelihood of experiencing sleep disturbance across scientific literature, with prevalence rates highest amongst adults aged 75 years and over (see Chart 2.2). These differences may be partly related to higher rates of comorbid conditions as discussed in section 1.1.2. While sleep problems remain prevalent across all adult age groups, the symptom types often vary with age. For instance, older people are more likely to have difficulty maintaining sleep, while younger adults have trouble initially getting to sleep.[95]

Chart 2.2: Prevalence of insomnia by age and sex



Source: Deloitte Access Economics calculations based on data from the Sleep Health Foundation Report, *Chronic Insomnia Disorder in Australia (2019).*

3 Methodology

This chapter provides an overview of the approach used to quantify the effectiveness of cognitive behavioural therapy for insomnia.

The aim of this analysis was to estimate the effectiveness of CBT-I for a specified target population of 100,000 individuals living with insomnia over a five-year period. The effectiveness of CBT-I in avoiding costs and improving wellbeing was estimated using cost-benefit analysis (CBA) and cost-effectiveness methodologies, leveraging cost-of-illness studies and available literature on treatment effectiveness

3.1 Cost-benefit analysis

A CBA considers the economic, wellbeing and social impacts attributable to an intervention, program or policy – in this case, the intervention is CBT-I treatment. A CBA only seeks to estimate the incremental impact of the in-scope CBT-I treatment for the target population – that is, the costs and benefits attributable to the treatment relative to a defined counterfactual scenario where individuals do not access CBT-I and remain untreated or receive commonly-used pharmacotherapy treatment.

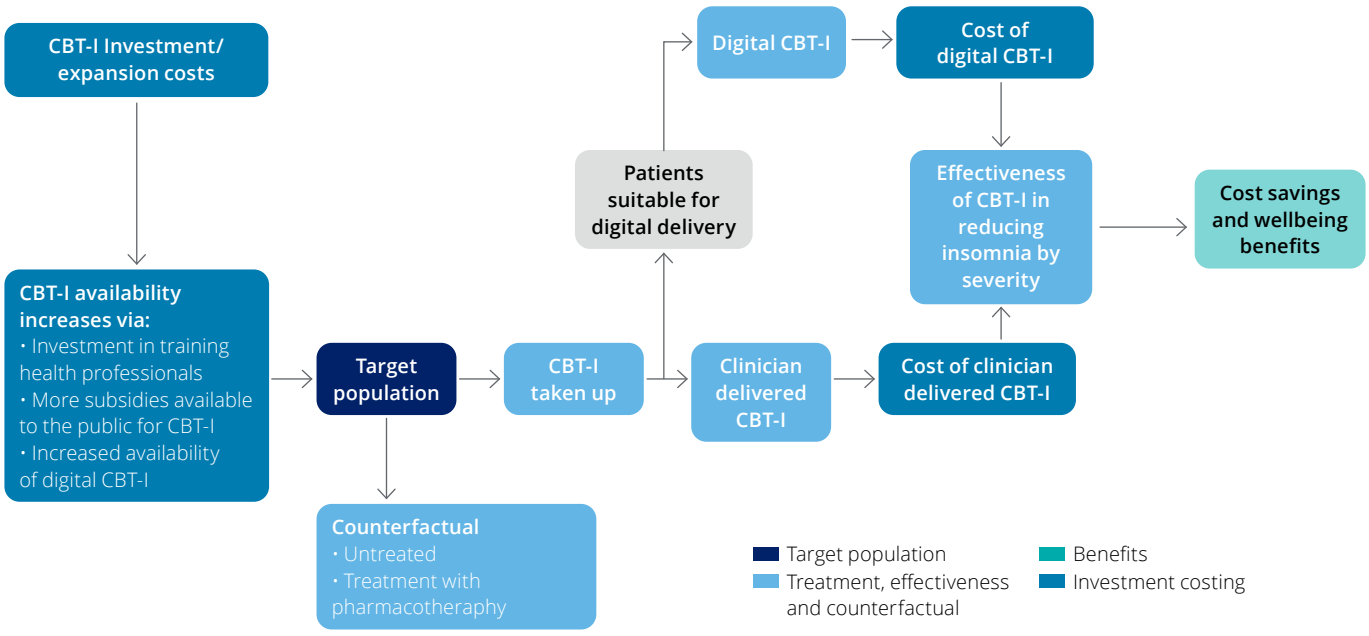
For the purposes of this effectiveness analysis, a CBA approach was applied to estimate the economic costs and benefits of CBT-I for a target population. This was applied to reflect the breadth of benefits that may be realised through a CBT-I intervention across the avoided health system utilisation and productivity losses. While real economic costs and benefits measured are reported
in dollar values, it is acknowledged that they may not necessarily materialise as direct cash savings or revenue gains.

Additional analysis was undertaken to consider the impact on wellbeing, leveraging a traditional cost-effectiveness methodology to establish the effectiveness with respect to one outcome: quality of life.

The framework used in this analysis compares the intervention with a CBT-I treatment against a counterfactual scenario of not receiving treatment or receiving a pharmacotherapy treatment. In the intervention scenario, individuals receive either digital or clinician-delivered CBT-I.[xi] This involves treatment delivery costs, as well as upfront investment to expand CBT-I availability and access for the target population. Both delivery modes reduce insomnia symptoms leading to cost savings and improvements in wellbeing. This framework is illustrated in Figure 3.1 and further described in the further described in the following sections.

The modelling drew on multiple data sources including publicly available data from the Australian Bureau of Statistics (ABS), Medicare Benefits Scheme (MBS) and Pharmaceutical Benefits Scheme (PBS), research evidence and literature, including Bettering the Evaluation and Care of Health (BEACH) data, MedicineInsight data, data provided by insomnia management clinical organisations and research programs in Australia,[96, 97] and previous Deloitte Access Economics reports on the economic and social cost of sleep disorders, including insomnia.[98]

Figure 3.1: Framework to measure the effectiveness of CBT-I



Source: Deloitte Access Economics.

[xi] Approximately 80 per cent of individuals are funnelled into digital CBT-I, with the remaining accessing clinician-delivered CBT-I. In a 100,000-target population over five years, this equates to 80,000 people accessing digital CBT-I and 20,000 accessing the clinician-delivered intervention.

The framework and methodology used was also co-designed with a Project Advisory Group, comprised of clinicians and sleep researchers and assembled to provide practical insight into CBT-I and available evidence in the sector.

Where possible, the incremental costs and benefits of CBT-I for the target population have been monetised. However, this is not always feasible due to the intangible nature of the impact or insufficient data to estimate their value relative to a counterfactual scenario. Benefits that could not be monetised are discussed qualitatively throughout this report.

3.1.2 Target population

The expanded CBT-I intervention is expected to reach 100,000 individuals with insomnia over a five-year period through referrals from primary health care. As detailed in section 3.2, the upfront investment, including ongoing professional development programs to train primary care clinicians in CBT-I and projected increases in the availability of digital CBT-I programs and number of psychologists with specialised insomnia training,[99, 100] is expected to ensure a sufficient clinical workforce to deliver services to this target population.

Within the target population, age and sex distributions are assumed to mirror the prevalence of insomnia in the Australian population (see section 2.2). Given the insomnia symptoms vary in severity, the target population was also categorised by symptom severity. This is further described in Appendix A.1.

3.1.3 The intervention scenario

Individuals in the target population are assumed to enter one of two delivery streams within the intervention case:

- **Digital CBT-I** – delivered through online platforms or apps without explicit clinician delivery on a per patient basis. Some clinician oversight is included to monitor risks and provide support where needed.
- **Clinician-delivered CBT-I** – delivered by a trained heath professional in a face-to-face or telehealth setting. The treatment may be delivered in an individual or a group setting.

Given the workforce challenges in providing clinician-delivered CBT-I to all individuals in Australia with chronic insomnia (see section 1.2.3), the combination of digital and clinician-delivered approaches models a realistic scenario where CBT-I access could be provided at scale to the Australian adult population. It is also recognised that some patients with insomnia are not appropriate for self-guided digital CBT-I interventions due to specific health, work or contextual factors.[101] Majority of individuals (80 per cent) were assumed to be suitable for digital CBT-I, while the remaining (20 per cent) were assumed to be suitable for clinician-delivered CBT-I (see Table A.2). This assumption was based on CBT-I trial data in Australian primary care which has implemented triaging recommendations of the ASA and the Royal Australian College of General Practitioners (RACGP), as well as the capacity of existing healthcare professionals to provide treatment to additional people with insomnia. Each delivery type was expected to generate varying degrees of participant completion. Specific assumptions relating to the participation and completion of treatment within the target population are outlined in Appendix A.2.

The time period of the intervention in this analysis was limited to five years. This accounts for a slow scale up and roll out of CBT-I, particularly digital delivery which is not extensively delivered in the current state. The share of individuals within the target population that receive CBT-I treatment each year was assumed to increase exponentially over the five-year period.

3.1.4 The counterfactual scenario

To estimate the incremental difference of CBT-I for the target population, the counterfactual scenario described the current treatment patterns for individuals with insomnia, that is, the outcomes that would be received without any CBT-I treatment. This estimate accounted for:

- the natural remission of insomnia symptoms over time without treatment (i.e., symptoms reduce or resolve without intervention)
- the majority of individuals with insomnia who receive pharmacotherapy treatment for insomnia, including the benefit they receive from medication in reducing insomnia symptoms and the cost they incur for accessing this treatment option
- the minority of individuals with insomnia who remain untreated but continue to experience insomnia symptoms.

Pharmacotherapy involves the use of prescription medications to improve sleep onset, duration or quality (see section 1.2.2). Without CBT-I, there are several treatment phenotypes in the current case, including individuals who:

- intermittently use pharmacotherapy over time, using insomnia medication for short-term periods in an on-and-off fashion
- are dependent on pharmacotherapy over a number of years
- have initial hesitations towards pharmacotherapy and either slowly escalate their use of insomnia medication over time or use it so intermittently that no benefits are gained
- oppose or avoid the use of pharmacotherapy for insomnia altogether and remain untreated.

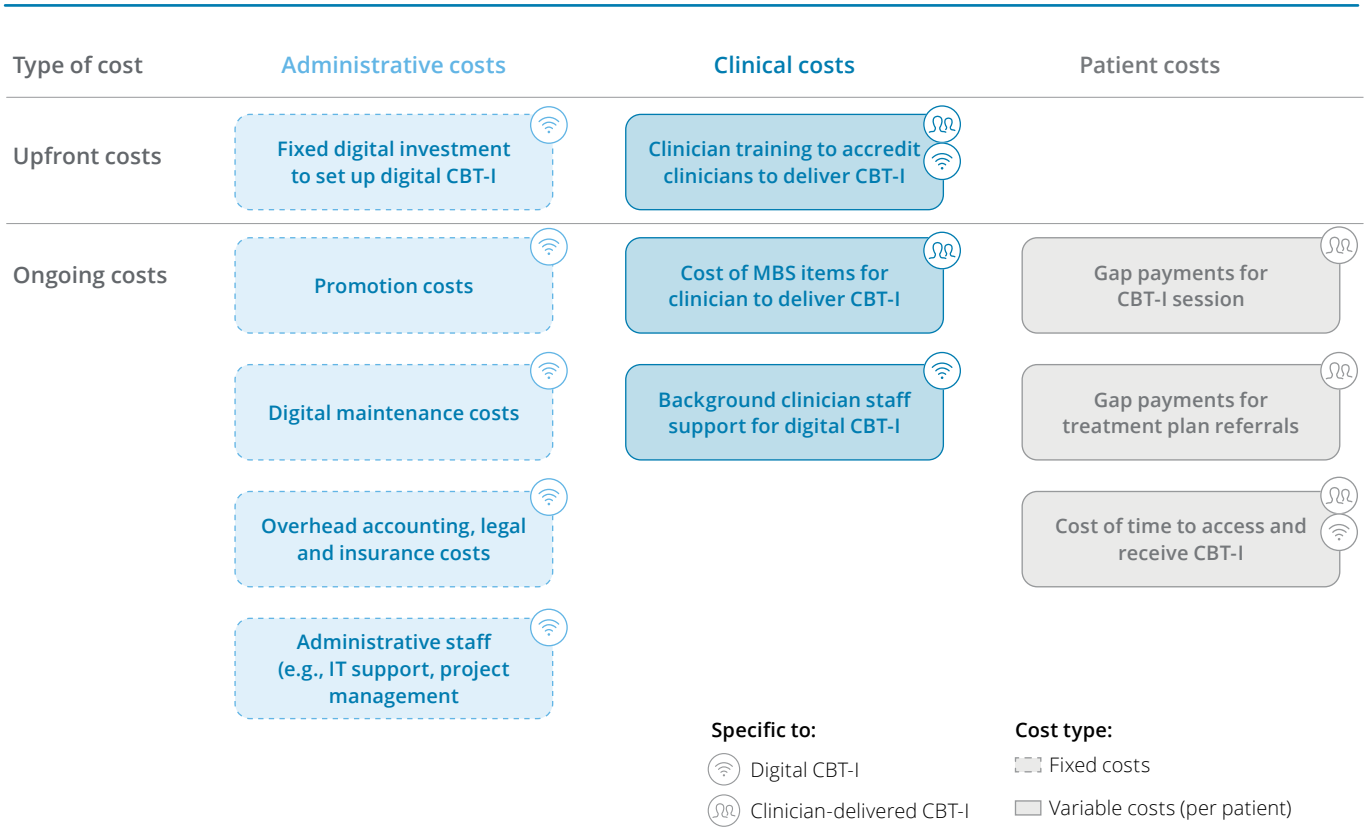
The counterfactual scenario was designed to represent an average case across these phenotypes using MedicineInsight data, BEACH data and a range of research evidence and literature. It is acknowledged that some people with insomnia may also receive other non-pharmacological approaches such as mindfulness-based programs or acceptance commitment therapy. These alternative treatments were not included in this analysis due to

limited data on the frequency, cost and benefits of use. Further detail on the assumptions, inputs and calculations used to inform the counterfactual scenario are provided in Appendix A.3.

3.2 Modelling the costs of CBT-I

The costs considered in this analysis for the CBT-I intervention included upfront and ongoing costs across administration, clinicians and patients. Some costs were fixed while others were dependent on the number of patients entering the intervention each year. This is shown in Figure 3.2.

Figure 3.2: Cost framework for CBT-I



Source: Deloitte Access Economics.
Note: Clinician training refers to the specific costs required to newly accredit clinical psychologists with the expertise to deliver CBT-I. It does not include initial upskilling costs related to becoming a clinician.

A range of data sources were used to quantify the cost to deliver CBT-I, including data from the MBS, ABS and other literature. The cost of delivering digital CBT-I also used budget estimates provided by the Project Advisory Group, aligned to a large primary care implementation trial of the Bedtime Window program (one Australian digital CBT-I program) in which patient costs, IT resource costs and clinician and administrative time was monitored to support economic evaluation.[xii, 102, 103, 104] These delivery costs were scaled to account for additional costs associated with larger at-scale delivery for 100,000 people. The cost of individual clinician-delivered CBT-I was estimated to be higher than that of group clinician-delivered CBT-I on a per person basis.

Further the opportunity cost of time for individual patients undertaking CBT-I treatment was calculated using the average hourly wage in Australia. However, it is acknowledged that individuals may or may not have otherwise spent the time explicitly working, i.e., CBT-I sessions could be completed during personal leisure time.

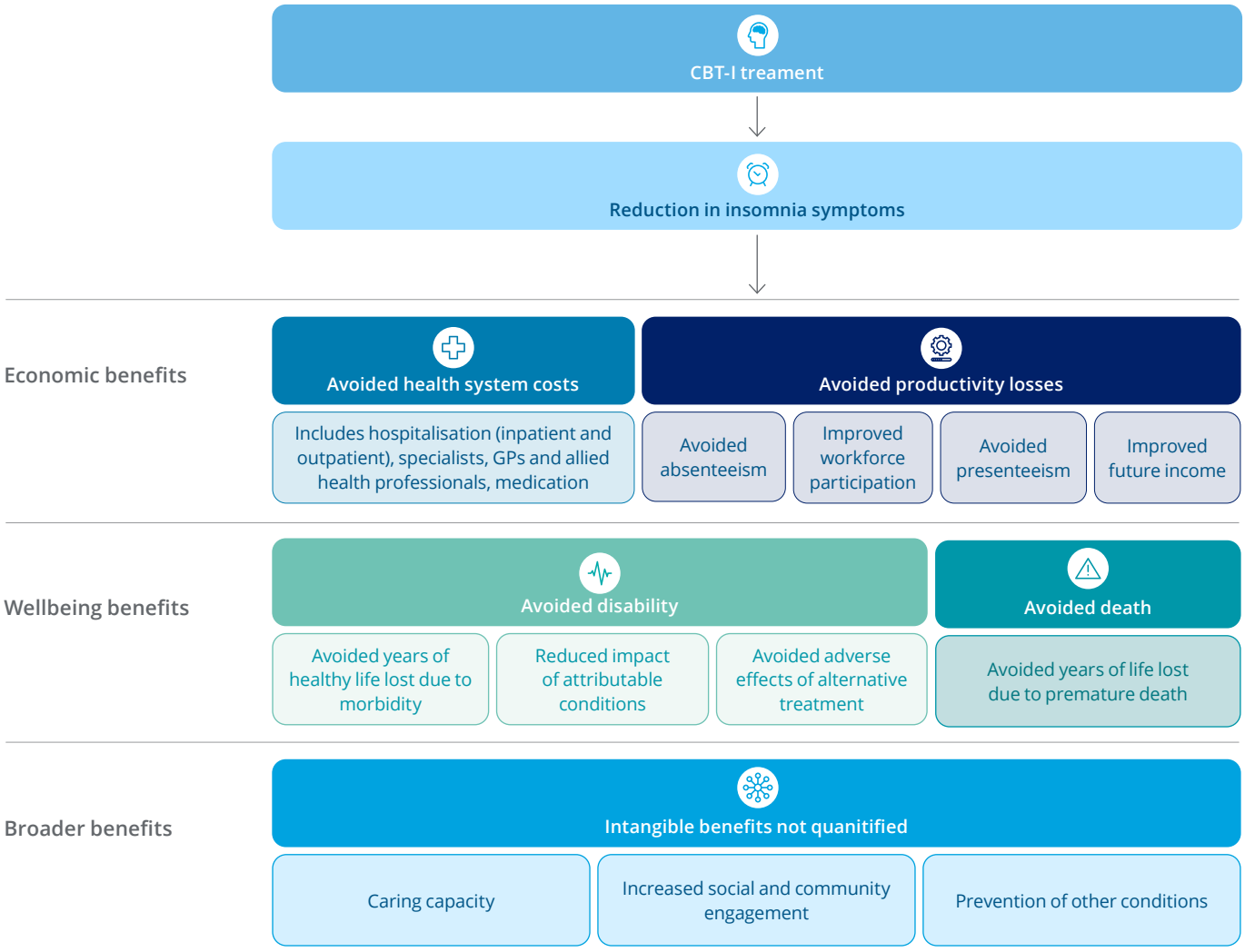
The incremental cost of delivering CBT-I was established by comparing the estimated cost of CBT-I for the target population to the cost of the counterfactual – i.e., pharmacotherapy treatment or no treatment.

Further detail on the estimation of costs to deliver CBT-I is provided in Appendix A.4.

3.2 Modelling the benefits of CBT-I

The benefits considered in this analysis for the CBT-I intervention included economic and wellbeing benefits. Benefits extended across the health system, productivity and wellbeing. This is shown in Figure 3.3.

Figure 3.3: Benefit framework for CBT-I



Source: Deloitte Access Economics.
Note: Insomnia is not directly associated with premature mortality. However, attributable conditions (e.g., depression) and treatments such as sedative-hypnotic medications have been linked to elevated mortality risk.[102] The economic and wellbeing benefits in this framework reflect the economic cost categories associated with insomnia quantified in the 2021 Deloitte Access Economics report on the social and economic cost of sleep disorders in Australia.[103]

[xii] Bedtime Window is a 5-session interactive self-guided digital CBT-I program where participants receive therapy recommendations in each weekly session tailored to their insomnia symptoms at baseline and weekly changes throughout the program. It has shown moderate-to-large and sustained improvements in insomnia, depression, anxiety, fatigue and maladaptive sleep-related beliefs.

3.2.2 Estimating the effectiveness of CBT-I

Estimating the effectiveness of CBT-I leveraged research on the relative reduction in insomnia symptoms associated with each treatment type, such as digital CBT-I or clinician-delivered CBT-I compared to the counterfactual scenario. A reduction in insomnia symptoms was measured using the ISI and averaged across a number of meta-analyses and other research (see Appendix A.5.2 for further detail).

A similar approach was taken to estimate the improvement in quality of life associated with treatment for insomnia, as measured by Quality-Adjusted Life Years (QALYs). This was used to inform the incremental cost-effectiveness ratio (ICER) for CBT-I with respect to the quality of life gained through the intervention.

QALYs are a non-financial measurement quantifying a gain in wellbeing. They measure the value of health outcomes by combining the quantity and quality of life lived. One QALY represents one year of life in full health, while years lived in less than full health are weighted by a factor between zero (equivalent to death) and one (full health). For example, a QALY of 0.8 means a person experiences the equivalent of 80 per cent of the year in full health. Similarly, 0.25 of a QALY gained through an intervention in one year would mean the intervention generated a 25 per cent improvement towards full health in the year. In practice, QALYs for a year of life are rarely 1, because most people experience less than perfect health. For many populations, an average year of life may be valued at around 0.8 QALY, though this varies with age and health status.[104]

3.2.3 Monetising the benefit of a reduction in insomnia due to CBT-I

Reduced insomnia symptoms can lower the costs directly associated with an individual's insomnia as well as any adverse effects caused by insomnia. These costs include health system costs such as hospital admissions, medical expenses for general practitioner (GP), specialist and allied health professional visits, as well as productivity costs including being absent from or less productive at work (absenteeism and presenteeism, respectively) and lost employment opportunities.[105] Reducing insomnia symptoms would be expected to avoid a share of these attributable costs.

Further, a number of other injuries and illnesses have been attributed to insomnia to varying degrees. Insomnia has been associated with mental health disorders such as depression, alcohol abuse and substance abuse,[107, 108] cardiovascular disease and hypertension,[109,110, 111, 112] and workplace accidents. Each of these conditions incur further health system and productivity costs. Where these injuries and illnesses develop directly because of a person's insomnia, the costs and any savings associated with improved symptoms should be attributed to the primary condition (insomnia). For example, there is an increasing body of research demonstrating the impact of CBT-I and reduced insomnia symptoms on the risk of mental health diagnoses and mental health relapse.[114, 115, 116] Benefits associated with reduced relapse and experience of mental health disorders was attributed to CBT-I in this instance.

Research shows that a reduction in insomnia symptoms lowers the cost burden of insomnia, with more severe cases at baseline experiencing a relatively larger reduction in the cost burden compared to less severe cases.[117] The 2021 Deloitte Access Economics *Rise and try to shine: the social and economic cost of sleep disorders in Australia* report estimates the health care costs and productivity losses associated with insomnia and conditions attributable to insomnia in Australia.[118]

A percentage reduction in the cost burden of insomnia (i.e., cost saving) was calculated using the estimated effectiveness of CBT-I in reducing insomnia and research on the relationship between insomnia symptoms and the cost burden of insomnia. This yielded the avoided health care costs, productivity and wellbeing losses due to CBT-I treatment. Given that benefits of CBT-I have been shown to persist beyond treatment cessation,[119] and for up to 10 years post-treatment in one study,[120] the cost savings associated with CBT-I were assumed to persist beyond the year of treatment (see Table A.10).

The incremental benefit of CBT-I was established by comparing the estimated benefit of CBT-I to the benefit of pharmacotherapy or no treatment in the counterfactual. Specific assumptions and avoided cost estimates per person are provided in Appendix A.5.3.

3.3 Modelling the cost-effectiveness of CBT-I

To determine the cost-effectiveness of CBT-I, the incremental costs were compared to the incremental benefits, that is, avoided costs to the health system and avoided productivity losses. This yielded the net economic benefit and benefit-cost ratio (BCR). The benefits of avoided wellbeing losses were calculated in addition to the net economic benefit and BCR.

The ICER was determined to enable comparison to other health interventions. This was estimated using the ratio of the cost per person for the intervention (see section 3.2), relative to the estimated average QALYs gained through treatment (see section 3.3.2).

3.5 Limitations

This analysis identified several limitations in estimating the effectiveness of CBT-I and its economic benefits, which are detailed below. It included a number of conservative assumptions, as listed in Appendix A, and additional sensitivity analysis was conducted to examine assumptions supported by limited evidence, in order to better understand their impact on key findings. These limitations should be considered when interpreting the results of this analysis.

Uptake rate of CBT-I within the target population
This analysis has considered a specific number of people in the target population rather than a specific uptake rate. In other words, the model assumes a 100 per cent uptake rate targeting 100,000 people. In reality, the uptake rate of the target population may not be 100 per cent. As such, the target population to which the intervention is promoted to may need to exceed 100,000 individuals to subsequently recruit the 100,000-person cohort that would the quantum of benefits outlined in this analysis.

Distribution of insomnia by age and sex within the target population
Depending on the roll out approach for the CBT-I intervention, the actual target population may have an alternative distribution by age and sex to that in the general population. For example, prior data has indicated higher prevalence of insomnia among females than males. Furthermore, relatively more young Australians may enter the intervention compared to the share of all those with insomnia. This may be a result of advertising and promotion efforts, suitability to CBT-I delivery forms (e.g., older adults may experience difficulties with digital treatment compared to face-to-face treatment, or alternatively individuals in remote areas may not have access to clinician-delivered CBT-I services), or awareness of the intervention amongst GPs. Research suggests that clinical outcomes of CBT-I (i.e., a reduction in insomnia symptoms) are unlikely to differ substantially by sex.[121] While younger age groups may experience positive clinical outcomes of CBT-I faster, people of all ages derive significant clinical benefits from CBT-I, particularly when accounting for comorbidities.[122, 123] To account for possible variation in distributions, this analysis has used an average clinical improvement in insomnia and reduced cost burden across all ages and sexes. As such, any adjustment to the input prevalence of males versus females would have a negligible impact on the results reported. However, in practice, changes in the cost burden of insomnia may differ by sex, generating a different degree of benefits.

Limited data on the relationship between a reduction in insomnia symptoms and the economic burden of insomnia
Data describing the degree of change in costs (e.g., healthcare, productivity) incurred due to a reduction in insomnia is limited. This analysis relies on estimates established by Sarsour et. Al (2011),[124] a study in the US from more than 10 years ago. While there is no comparable Australian data measuring a similar relationship at the time of this report, US estimates have been used as a proxy given comparability between the Australian and US populations with respect to how individuals with insomnia react to treatment based on severity. Sensitivity analysis has been undertaken on these estimates to determine the potential range of results should this differ between the two populations.

Limited data describing the realisation of benefits when treatment remains incomplete
There is limited data describing how insomnia symptoms improve over the course of a treatment. For the purposes of this modelling, the conservative assumption was made that individuals who do not complete the treatment do not receive any benefit. In reality, partial completers could realise some benefit, further strengthening the benefits accrued through the intervention.

Estimating the social and economic costs of insomnia that are avoided because of CBT-I
This analysis relies on preexisting evidence to estimate the social and economic costs of insomnia that could be avoided by CBT-I. Specifically, it leverages a 2021 Deloitte Access Economics report on the social and economic cost of sleep disorders, including insomnia.[125] The economic costs of insomnia estimated in this 2021 report relate to those of insomnia for the general population in Australia, and may differ from those experienced by individuals referred to and receiving CBT-I. This may be due to individual's preferences towards a digital intervention or the severity of their insomnia for example. Further, actual costs may have changed in the time elapsed since this 2021 analysis due to changes in treatment effectiveness or side effects, the structure of Australia's health system or the impact of insomnia on the productivity of individuals.

Capturing adverse effects
The estimated QALYs gained account for the impact of adverse effects such as the short-term impacts of sleep restriction in the case of CBT-I, or the increased risk of falls, psychomotor or cognitive effects associated with pharmacotherapy. However, a reduction in insomnia symptoms on the ISI is unlikely to fulsomely capture these adverse effects, particularly those that are adjacent to the symptoms of insomnia. As such, any consequent impacts on health care costs or productivity losses may be tapered by adverse effects.

Time horizon of benefits
The time horizon has been restricted to five years, the period of time during which the intervention would be rolled out. However, benefits of CBT-I may persist beyond this, with some studies demonstrating benefits of CBT-I up to 10 years post-treatment.[126, 127] This means the degree of benefits may be greater than that reported. Sensitivity analysis on the time horizon for benefits has been undertaken to understand its impact.

Understanding the current case (i.e., the counterfactual)
Data on the pattern of pharmacotherapy use in Australia is limited, and there is minimal evidence describing the relationship between pharmacotherapy and reduced insomnia symptoms over time in other jurisdictions. Given variability in how individuals with insomnia use pharmacotherapy, the frequency and intensity of medication use has been informed by the best available data. However, more individuals may

overuse pharmacotherapy than what is able to be estimated with existing data. Sensitivity analysis has been undertaken on these assumptions. Further, the modelling does not account for individuals who rely solely on over-the-counter medications (e.g., antihistamines) or alcohol to self-medicate for insomnia. Given the lower effectiveness of these treatments compared to prescription medications, the inclusion of these individuals in the target population would drive a higher benefit for CBT-I compared to the counterfactual in reality.

Complexity of treatment received

For the purposes of the analysis, it was assumed that individuals in the target population do not receive both CBT-I and pharmacotherapy at any one time. In reality, individuals receiving pharmacotherapy for insomnia prior to CBT-I may experience a transition period where they wean off any medication being taken. This may increase the incremental cost but reduce the incremental benefit in the short term.

CBT-I workforce capacity

This model assumes there is sufficient capacity within the existing healthcare professional workforce (e.g., psychologists specialising in insomnia management) to meet CBT-I demand of the target population. Although, it accounts for the cost of upskilling and accrediting the necessary number of practicing clinicians to deliver CBT-I specifically in acknowledgement that not all healthcare professionals may be appropriately trained to deliver CBT-I services in the current case. In actuality, the degree of capacity within the clinical psychologist workforce to deliver the necessary services in unclear and data is limited. Insufficient supply of clinicians to deliver CBT-I to the target population would necessitate additional costs to upskill individuals (e.g., to obtain university degrees).

4

Cost-effectiveness of expanded access to CBT-I

Expanded access to CBT-I is highly cost effective. The intervention would generate significant economic and wellbeing benefits relative to its costs, with digital CBT-I representing the most cost-effective delivery mode.

This section presents the estimated cost effectiveness of CBT-I in economic terms, and an assessment of wellbeing benefits that could be generated.

4.1 Economic cost-benefit analysis

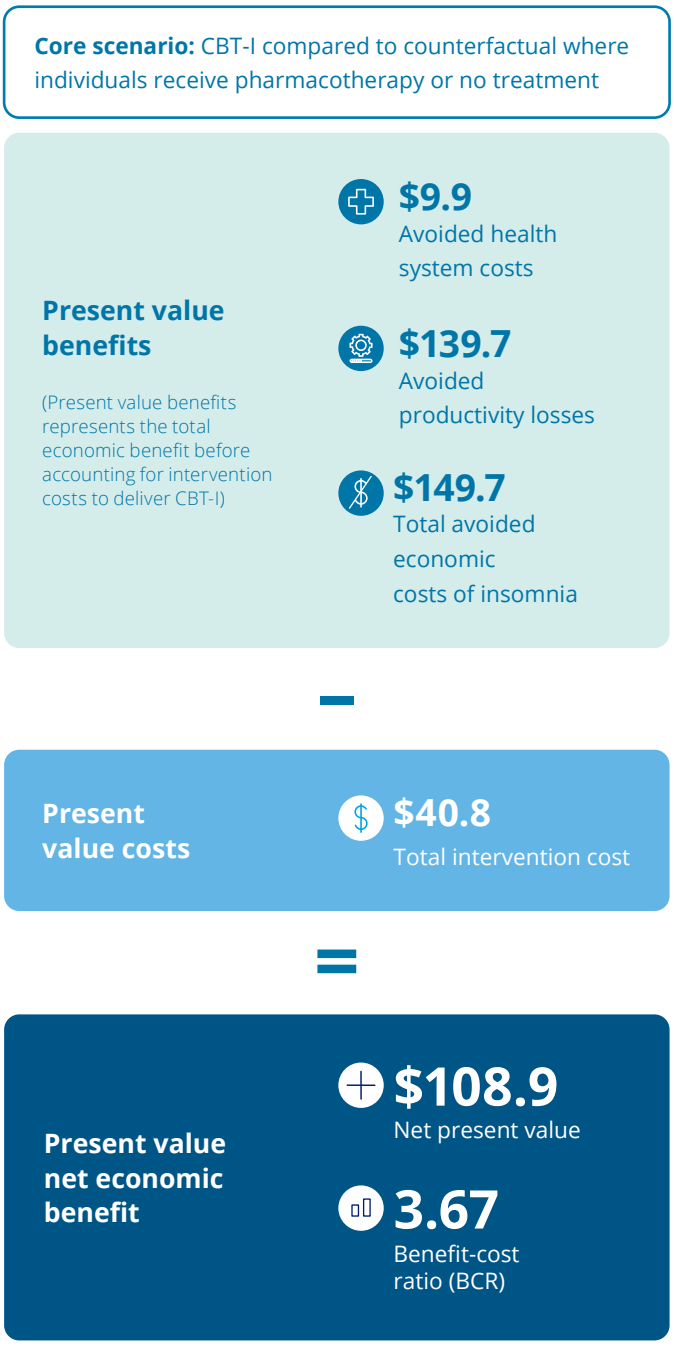
The economic cost effectiveness results of this analysis are presented in Table 4.1. Overall, rolling out CBT-I to 100,000 individuals with insomnia over five years is estimated to cost $40.8 million (present value, PV). However, the total avoided economic benefit realised would outweigh this, totalling $149.7 million (PV) over the same period. Majority of these benefits (93.4 per cent) derive from avoided productivity losses ($139.7 million), reflecting the significant impact of insomnia on individuals' ability to engage with and attend work. The remaining benefits would be due to avoided health system costs.[xiii]

Comparing the incremental costs and benefits of CBT-I for 100,000 adults over five years, the analysis estimates that the intervention would yield a net economic benefit of approximately $108.9 million (PV). This represents a benefit-cost ratio (BCR) of 3.67, indicating that for each dollar invested in CBT-I up to $3.67 of benefits could be generated. This is a significant and positive economic benefit for individuals with insomnia, government and the Australian economy, demonstrating that expanding access to CBT-I would be highly cost effective.[xiv] In part, the cost-effectiveness of the treatment reflects the low cost to deliver digital CBT-I.

These results are broadly consistent with international evidence. For example, a study from Germany found a BCR of 3.09 for internet delivered CBT-I, although this only captured productivity gains from an employer perspective,[131] whereas the present analysis captures a broader range of avoided costs, including health system savings.

On a per person basis, expanding access to CBT-I could deliver a net PV economic benefit of $1,089 per person with insomnia over five years. This would generate cost savings with respect to reduced health system expenditure and improved productivity. These net economic benefits estimated remain conservative when compared to other research in the US which suggests a net monetary benefit of approximately USD $681 per person (approximately $900 AUD) over six months for digital CBT-I.[xv, 132]

Figure 4.1: Economic cost-benefit analysis results ($ millions, PV)



Source: Deloitte Access Economics (2026).
Note: Total intervention cost refers to the incremental cost to deliver CBT-I relative to the counterfactual scenario.

[xiii] The split between avoided productivity and health system costs reflects the relative distribution of cost categories in the 2021 Deloitte Access Economics report on the social and economic cost of sleep disorders in Australia.

[xiv] It is important to note that benefits related to reduced health care use and avoided productivity loss in this analysis may not directly translate into cash saved or increased revenue – benefits quantified in this report are economic in nature.

Expanding CBT-I access would cost approximately $665 PV per person on average, weighted by the assumed rates of suitability for each delivery modality (Figure 4.2). However, digital delivery would cost substantially less compared to clinician-delivered CBT-I. The higher cost of clinician-delivered CBT-I is primarily driven by the intensity of clinician time required to deliver the program. Conversely digital delivery requires less clinician time and provides an opportunity for some economies of scale once the digital platform and supporting infrastructure are established. This makes digital CBT-I the most cost-effective delivery mode. Although it is recognised, in practice and within this analysis, that not every individual with insomnia is suitable for the less costly digital delivery given comorbidities, case complexities, patient preferences and other risk factors such as pregnancy or caring responsibilities. As such, the provision of some clinician-delivered CBT-I is still required.

4.2 Wellbeing benefits

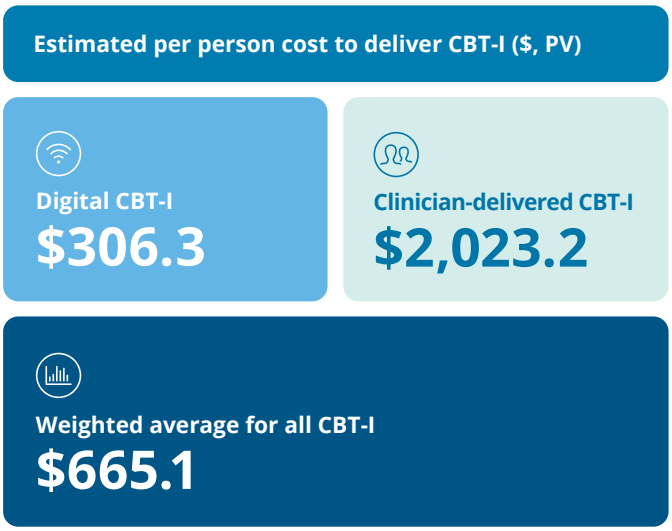
In addition to health and productivity benefits, reducing insomnia symptoms through CBT-I improves individuals' quality of life. These wellbeing benefits, although less tangible, can be significant, and at times, even more so than the benefits of reducing the tangible cost burden of a condition.

Overall, expanding access to CBT-I could avoid an additional $460.2 million in wellbeing losses over five years. On a per person basis, this is equivalent to approximately $4,602 in avoided wellbeing losses. This represents a substantial improvement in quality of life for individuals with insomnia with respect to reduced morbidity, as well as premature mortality where hypnotic use is reduced. Avoided wellbeing losses would be primarily due to a reduction in insomnia symptoms itself; however, a small improvement (21.4 per cent) would be due to conditions directly attributable to insomnia such as depression.

When directly assessing the cost-effectiveness of CBT-I in terms of QALYs, digital CBT-I is estimated to have in ICER of $4,872 per QALY gained compared to no treatment (see Figure 4.3). This means that one additional year of life in full health would cost about $5,000 per individual with insomnia treated with digital CBT-I. Comparatively, gaining one additional year of life in full health through clinician-delivered CBT-I would cost approximately $29,000 per individual with insomnia.

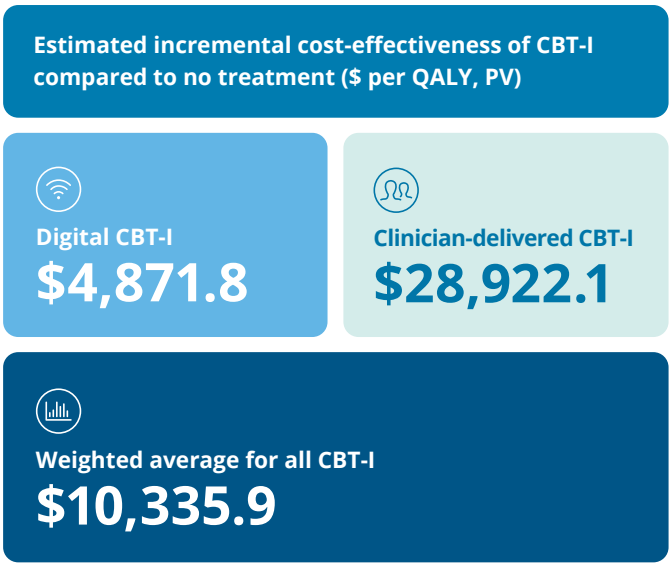
The benchmark for assessing the efficiency of new treatments in Australia is recognised to be $50,000 per QALY gained.[133] In this context, both digital and clinician-delivered CBT-I are considered highly cost effective compared to no treatment. Should assumptions around the suitability for digital and clinician-delivered CBT-I streams change from the estimated 80-20 per cent allocation in this analysis, improving access to CBT-I in Australia would remain highly cost effective compared

Figure 4.2: Estimated per-person cost to deliver CBT-I ($, PV)



Source: Deloitte Access Economics.
Note: Approximately 80 per cent of individuals assumed suitable for digital CBT-I. The weighted average cost reflects distribution of suitability between delivery modes.

Figure 4.3: Estimated incremental cost-effectiveness of CBT-I compared to no treatment ($ per QALY, PV)



Source: Deloitte Access Economics (2026).

xv This large difference is likely driven by less conservative assumptions regarding healthcare cost reductions of up to 42 per cent as a result of CBT-I.

to no treatment. The ICER for pharmacotherapy treatment when accounting for adverse treatment effects of medications is estimated to be approximately $40,394 per QALY gained.[xvi] Despite variability in the wellbeing gains of pharmacotherapy depending on use patterns and medication type (see section 3.5), the high ICER for pharmacotherapy relative to CBT-I illustrates the cost efficiencies in insomnia treatment that could be realised through CBT-I, particularly digital CBT-I. However, it is acknowledged that the two distinct populations who would access digital or clinician-delivered CBT-I may not be directly comparable due to the triaging criteria applied and suitability reasons outlined in section 4.1.[xvii]

The estimated ICERs for digital and clinician-delivered CBT-I are largely consistent with international evidence. Recent studies report an ICER of approximately AUD $20,000 per QALY for digital and clinician-delivered CBT-I.[134, 135] In this context, this analysis within the range reported in comparable studies, reinforcing the strong cost effectiveness of CBT-I.

4.3 Additional benefits

In addition to reduced health care costs, avoided productivity losses and improved wellbeing, CBT-I is likely to generate broader benefits that have not been able to be quantified in this analysis. For example, reducing insomnia symptoms may reduce stress on families and improve caregivers' capacity (formal or informal care).[136] Further improving daytime functioning for people with insomnia is also likely to increase social and community engagement.[137, 138] CBT-I may also contribute to the long-term prevention of chronic conditions such as cardiovascular disease or diabetes given poor sleep health can be a significant risk factor.[139, 140] However, attributing these outcomes directly to insomnia, or the reduction of insomnia symptoms, is challenging and require further investigation.

4.4 Sensitivity analysis

Sensitivity analysis was undertaken to assess the potential range of results given uncertainty surrounding the following inputs:

- **Real discount rate** (in addition to the 7 per cent central scenario, 3 and 10 per cent): the results of the analysis are somewhat sensitive to the discount rate. In all three scenarios, the BCR remains positive. However, given the five-year benefits persistence period, decreasing the real discount rate allows the future benefits to be relatively more valuable, increasing the present value benefits and BCR (up to 3.71). The costs are less sensitive given they take place over a shorter time period (1 year).
- **Time horizon of benefits** (in addition to the 5-year central scenario, 7 and 10 years): the results are highly sensitive to the length of time that the benefits of CBT-I persist for. As the time horizon for benefits extends, the BCR increases since costs remain unchanged. Should benefits persist for an additional two years, the BCR could be as high as 12.16, representing $12.16 of economic benefits generated for every dollar invested. In fact, if benefits were to persist for 10 years, it is likely that delivering CBT-I would represent an overall lower economic cost across the time horizon when compared to the counterfactual. This would generate a small cost saving because unlike CBT-I where the cost is only incurred as a once-off, the cost of the counterfactual (i.e., pharmacotherapy) must be incurred for each year that benefits are realised, thereby making it a more costly intervention the longer benefits persist. Equally, the CBT-I, i.e., the cost required to gain each QALY, for each treatment becomes more cost-effective as benefits accrue and costs are spread over longer. Since CBT-I generates substantial behaviour change and provides strategies to manage insomnia symptoms for the long term, it is likely that access to CBT-I would continue to generate benefits for at least some people beyond the modelled five-year timeframe.
- **Uptake rate** (in addition to the central scenario with slow-uptake (see Table A.3), scenarios with moderate and fast uptake): the results are moderately sensitive to the uptake rate of CBT-I. Increasing uptake rate such that 10,500 individuals take up CBT-I in year one (compared to 6,250 in the core scenario) increases the economic benefits by approximately 11 per cent. Doubling the uptake rate to 20,000 individuals in year one would increase the economic benefits by 29 per cent compared to the central scenario. In all three scenarios, the BCR remains positive and significant. Ultimately, faster uptake of CBT-I means that a greater share of the target population accrues benefits for longer within the five-year time horizon, as compared to the central scenario where a shorter period of benefits would be accrued for those entering the intervention later on.
- **Distribution of insomnia severity in the target population** (in addition to the central scenario which relies on data from the Bedtime Window participants referred by GPs and the Monash University Healthy Sleep Clinic, a scenario which relies on data from Sarsour et al. (2011),[141] where individuals have less severe insomnia symptoms on average. Specifically, 60 per cent of individuals in the target population would have subthreshold insomnia in this new scenario, compared to 22 per cent in the central scenario. Shifting the severity of

xvi Compared to no treatment.

xvii In some instances, this may impact the relative effectiveness of CBT-I in QALYs gained. However, this analysis has sought to account for this lack of comparability by considering the impact of each treatment type (digital versus clinician-delivered) separately.

insomnia in the target population downwards and towards less severe insomnia decreases the BCR from 3.67 to 3.42, representing a 6 per cent reduction in net economic benefits compared to the central scenario. This is because more severe insomnia is associated with a greater economic cost when compared to less severe insomnia. As such, CBT-I reduces the economic costs by relatively less when the starting point for individuals is a less severe case of insomnia.

- **Inputs for the pharmacotherapy treatment counterfactual** (in addition to the central scenario where 90 per cent of individuals use pharmacotherapy, a scenario where only 50 per cent of individuals currently use pharmacotherapy, and a scenario where 50 per cent of individuals using pharmacotherapy for longer than recommended): the results of this analysis are sensitive to the estimated pharmacotherapy counterfactual. However, in all three scenarios, the BCR remains positive.
  - Decreasing the share of people using pharmacotherapy in the counterfactual to 50 per cent increases the total incremental PV benefit of CBT-I by approximately 8 per cent. This is because the benefit of CBT-I compared to no treatment is greater than that compared to pharmacotherapy which provides some relief for insomnia symptoms. This benefit is somewhat offset by higher incremental treatment costs for no treatment compared to pharmacotherapy. Overall, this drops the BCR slightly to 3.11. The ICER remains unchanged given that it does not shift the effectiveness of CBT-I treatment types.
  - Increasing the share of people who use pharmacotherapy for longer than recommended to 50 per cent decreases the total PV benefit by approximately 27 per cent given they now accrue further benefits of reduced insomnia symptoms from pharmacotherapy in the counterfactual (although somewhat offset by additional adverse events). At the same time, the incremental cost of CBT-I relative to the counterfactual scenario decreases by 90 per cent because pharmacotherapy treatment is now a relatively more costly intervention. As the incremental costs decrease by more than the benefits the overall BCR increases.
- **Reduction in the economic cost of insomnia due to CBT-I** (in addition to the central scenario, a scenario where the cost burden of insomnia only decreases by 10 per cent): the results of this analysis are highly sensitive to the estimated effectiveness rates of CBT-I in reducing the cost burden of insomnia. The central scenario leverages Sarsour et al. (2011)[142] to estimate that that health care costs and productivity losses are reduced by approximately 25 per cent on average as a result of CBT-I treatment.[xviii] Should CBT-I treatment achieve less than half of this cost saving (10 per cent), the BCR would still remain positive at 1.75. While this indicates results are sensitive to this input, it highlights that the likelihood CBT-I would generate a net cost burden is low. In fact, expanding access to CBT-I would only require a 5.7 per cent reduction in the cost burden of insomnia to breakeven. While this analysis leverages a US-based study from 2011 as the best available data at this point in time, these sensitivity results give confidence that expanding access to CBT-I in Australia would provide a positive benefit, even if population, health and cultural differences exist between the two countries.

Specific results on the sensitivity analysis undertaken are provided in Appendix B.

[xviii] Equivalent to a reduction in insomnia symptoms equal to approximately one category on the ISI.

5

Conclusion

Expanding access to CBT-I is estimated to generate up to $3.67 of economic benefits for each dollar invested, with additional benefits to wellbeing and improved quality of life for individuals with insomnia. This represents a highly cost-effective treatment option for insomnia.

This section presents future opportunities for CBT-I treatment for insomnia.

Conclusion

This report estimates that expanding access to CBT-I to 100,000 adults with insomnia in Australia could generate $149.7 million in total economic benefits over five years through cost savings in the health system and avoided productivity losses. This means up to $3.67 of economic benefits could be generated for every dollar invested, representing a cost-effective treatment option for insomnia.

Treating insomnia with digital CBT-I is estimated to cost approximately $306 per person, while clinician-delivered CBT-I would cost approximately seven times more at $2,023 per person. While digital CBT-I is a relatively cheaper treatment option, clinician-delivered services can provide targeted support for complex cases that digital CBT-I would be less appropriate in treating. As such, while considered substitutes, there is a share of the population living with insomnia that will not be suitable for digital self-guided delivery and will always require more costly clinician-delivered services.

Given the improvements to wellbeing such as improved daily functioning and reduced fatigue across both delivery modes, CBT-I overall is a highly cost-effective initiative. Digital CBT-I is estimated to require $4,872 of investment to generate 1 QALY, while clinician-delivered CBT-I would require a $28,922 investment. Both CBT-I delivery modalities lie within the $50,000 per QALY gained benchmark to indicate cost effectiveness, demonstrating their cost-effectiveness as a treatment option.

This analysis demonstrates the impact of a phased solution to treating insomnia, rolling out a digital CBT-I to 100,000 adults over five years, redirecting appropriate individuals to clinician-delivered services due to suitability requirements. The prevalence of insomnia among Australian adults is high and likely higher than that reported. It is estimated that at least 3.2 million Australian adults have insomnia, but despite CBT-I's recommendation as a first line treatment, less than 1 per cent access it.[143] This high degree of underutilisation means that should the intervention be expanded further, a much larger cohort could benefit from CBT-I. While this analysis only considers individuals accessing treatment through primary care, there is also a share of individuals currently not obtaining treatment who may still benefit from CBT-I.

Achieving these benefits relies on sufficient workforce supply to deliver CBT-I through digital and clinician-delivered means. While this analysis assumes workforce capacity is sufficient, the actual degree of workforce capacity remains unknown and further upskilling may be required.

Expanding access to CBT-I to 100,000 adults with insomnia in Australia could generate

$149.7 million

in total economic benefits over five years

5.1 Future opportunities

This report demonstrates the considerable economic and social benefits of treating insomnia with CBT-I in Australia. The findings presented in this report aim to demonstrate the potential impact of expanding access to CBT-I. The report also highlights the importance of a number of policy responses to support the identification, management and prevention of insomnia in Australia. These include:

Upskill the available workforce capable of delivering CBT-I:	Ensuring sufficient workforce capability to meet increased demand for CBT-I would limit supply side impacts that may affect the availability of CBT-I for some patients. Further training could be made more accessible to healthcare professionals such as GPs and psychologists.
Increase awareness of CBT-I among frontline care providers	Educating frontline care providers (e.g., GPs, psychologists, nurses, pharmacists and clinical social workers) would support more effective referral pathways. Education and increased awareness should relate to sleep health and available treatments, including CBT-I as the recommended first line treatment for insomnia.
Develop funding pathways to increase the uptake of CBT-I	Current funding pathways may contribute to the limited uptake of CBT-I programs more generally, and can result in out-of-pocket costs for patients. To improve affordability and strengthen the incentives for clinicians, new or revised MBS items, along with potential changes to eligibility under Mental Health Treatment Plans within the Better Access initiative, could better support primary care professionals to assess insomnia and guide patients toward appropriate CBT-I treatment options. In addition, consideration could be given to funding models that enable subsidised access to digital CBT-I as part of a structured care pathway, recognising that the MBS does not currently reimburse stand-alone digital CBT-I.
Deliver public health awareness and education campaigns	Delivering targeted public health campaigns to highlight the importance of insomnia, preventative sleep health and opportunities to access CBT-I would increase the likelihood that individuals with insomnia will present to their GP to discuss insomnia and seek access to CBT-I.
Introduce routine insomnia screening in primary care	Routine screening for eligible patients showing potential signs of insomnia would help identify undiagnosed individuals. Addressing this unmet need is important to reduce the costs of untreated insomnia, however it could also increase the demand for CBT-I services, requiring additional considerations of balancing access to CBT-I and the costs associated with both routine screening and service delivery to meet this demand.

Each of these points present an opportunity for future work to increase the utilisation of CBT-I as a recommended first line treatment for insomnia, leading to better outcomes for people living with insomnia. These future opportunities will require careful planning and evaluation to ensure that they achieve the intended outcomes.

A

Appendix A
Technical appendix

A.1. Target population

The target population is the number of individuals impacted by this proposed intervention. The target population is a function of the prevalence of insomnia and the uptake rate of treatment among the population with insomnia. All individuals, i.e., 100 per cent of the target population, will receive CBT-I. All individuals are assumed to be over 18 years of age.

A.1.1. Distribution of insomnia within the target population

The distribution of insomnia severity within the target population draws on data provided by the Project Advisory Group from Bedtime Window participants referred by GPs and the Monash University Healthy Sleep Clinic. Additional sensitivity analysis was undertaken using a US study by Sarsour et al. (2011). The distribution across the full spectrum of the ISI was reweighted to only include those at subthreshold severity or higher, assuming that only individuals with insomnia symptoms would enter the intervention. The distribution of insomnia severity used in the central scenario modelling is provided in Table A.1.

Table A.1: Distribution of insomnia by severity (of individuals with insomnia)

Severity category	ISI score	Share of individuals (%)
Subthreshold insomnia	8-14	21.99
Moderately severe insomnia	15-21	54.23
Severe insomnia	22-28	23.78

Source: Deloitte Access Economics, calculated using data provided by the Project Advisory Group relating to the Monash University Healthy Sleep Clinic and Bedtime Window program.[145, 146]

A.2. The intervention

The assumptions used to distribute individuals with insomnia between delivery modalities within the intervention are described in Table A.2. It is assumed that while all individuals incur the costs of the intervention, only those who complete treatment receive the benefit. In reality, the analysis acknowledges that those who partially complete CBT-I may receive some benefit.

Table A.2: Distribution of target population by delivery method

Input/assumption	Value	Source/Comment
Individuals with insomnia suitable for digital CBT-I	79.10%	Drawn from Sweetman et al. (2024).[147, 148] It is assumed all other individuals would only be suitable for clinician-delivered CBT-I due to the complexity or severity of their insomnia.
Share of individuals receiving individual, clinician-delivered CBT-I	95.00%	Informed by the Project Advisory Group in the absence of delivery pattern data.
Share of individuals receiving group, clinician-delivered CBT-I	5.00%	Informed by the Project Advisory Group in the absence of delivery pattern data.

Input/assumption	Value	Source/Comment
Rate of treatment completion		
Digital CBT-I	58.40%	Drawn from Takano et al (2025).[149]
Clinician-delivered CBT-I	83.30%	Drawn from Takano et al (2025).[150]

Source: See table.

Table A.3: Modelled uptake of CBT-I over time (new entrants to the intervention)

Year of intervention	1	2	3	4	5
New participants	6,250	6,250	12,500	25,000	50,000

Source: Deloitte Access Economics.

A.3. The counterfactual

A.3.1. Persistence of insomnia in the counterfactual

Given the breadth of risk factors for insomnia and the high degree of variability in its expression, individuals' experience of insomnia changes over time. For example, an individual with insomnia may experience less severe symptoms when confounding factors such as work stress change, even without treatment. Further, some people may enter remission naturally as symptoms resolve themselves. To account for this, the analysis considered the natural remission of insomnia over time, assuming that while an individual entering the intervention would have insomnia in year one, the likelihood of insomnia symptoms persisting would drop off over time. Further detail on the specific rate of insomnia persistence over time is provided in Table A.4.

Table A.4: Persistence of insomnia over time, assuming no treatment

Year of intervention	1	2	3	4	5
Persistence of insomnia symptoms	100.00%	80.83%	72.76%	64.68%	58.30%

Source: Deloitte Access Economics, based on Morin et al. (2020).[152]

A.3.2. Treatment of insomnia in the counterfactual

At present, majority of individuals not receiving CBT-I either remain untreated or receive pharmacotherapy treatment for their insomnia.[153] This was assumed to be the core counterfactual scenario.

In line with GP prescription patterns in the BEACH data, it was assumed that 90 per cent of individuals receive pharmacotherapy treatment for insomnia in the core counterfactual scenario, and only 10 per cent remain untreated.

The approach to modelling the counterfactual sought to estimate the average case of pharmacotherapy use. The recommended treatment time for most pharmacotherapy options is between two weeks and three months.[155] The average case in this analysis accounted for both individuals who receive the recommended treatment duration as well as individuals who exceed this and visit multiple GPs to access multiple prescriptions over a longer period or alternatively substitute between medication types. The rate of overuse was established using MedicineInsight data on insomnia prescription patterns.[156] The average duration of pharmacotherapy

treatment over a year was calculated using the inputs in Table A.5. It was assumed that individuals with insomnia receiving pharmacotherapy treatment would receive treatment every 12 months. However, it is acknowledged that data on the exact use patterns of pharmacotherapy over time for insomnia is limited and that this estimate applies the best available data.

Since pharmacotherapy is not assumed to have long-term benefits for chronic insomnia, it was assumed that any reduction in insomnia symptoms due to pharmacotherapy would cease with the cessation of pharmacotherapy use – i.e., the benefits of pharmacotherapy treatment would not persist beyond the treatment time. Further, in the absence of robust data, it was assumed that individuals undertaking pharmacotherapy treatment would, at minimum, complete the recommended treatment dose.

The cost of pharmacotherapy in the counterfactual was estimated using the total cost of prescription medication for insomnia established in the 2021 Deloitte Access Economics *Rise and try to shine: the social and economic cost of sleep disorders in Australia* report.[157] Inflated to 2025 figures, this cost was used to determine an average per person cost (based on the number of individuals with insomnia that receive pharmacotherapy treatment). Further, it was expected that individuals with insomnia would need to visit a GP to obtain a prescription. This was costed based on the MBS. The counterfactual cost calculation for pharmacotherapy treatment is described in Table A.5. It is acknowledged that this does not fully capture the cost of over-the-counter medications or other self-medications such as herbal supplements or alcohol. Untreated individuals were assumed to incur no treatment costs.

Table A.5: Inputs to establishing the pharmacotherapy counterfactual

Input/assumption	Value	Source/Comment
Share of individuals receiving pharmacotherapy	90.00%	Drawn from BEACH data leveraged for estimating the economic and social cost of sleep disorders.[158]
Share of individuals receiving no treatment	10.00%	Drawn from BEACH data leveraged for estimating the economic and social cost of sleep disorders.[159]
Share of scripts using recommended treatment length	88.33%	Drawn from Begum et al. (2021).[160]
Share of GP scripts exceeding recommended treatment length	11.67%	Drawn from Begum et al. (2021).[161]
Average recommended treatment time	42 days	Informed by the Project Advisory Group, drawing on therapeutic guidelines and Pharmaceutical Benefits Scheme (PBS) prescription limits.
Average overuse treatment length	322 days	Drawn from Woods et al. (2022).[162]
Average share of the year for which pharmacotherapy benefits are realised and costs are incurred	20.40%	Calculated using the share of scripts by recommended treatment time and average treatment time (recommended and overuse)
Cost of pharmacotherapy per person per year	$206.78	Calculated using the cost of prescription medication, derived from the unit cost of a script for insomnia and the average number of scripts obtained per year,[163] and the cost of a GP encounter ($128.92) defined by the MBS. MBS, the average out of pocket cost for a GP encounter, as well as the average number of scripts obtained per year which indicates the number of GP encounters required annually.

Source: Deloitte Access Economics and various sources.

A.4. Estimating the costs of CBT-I

The estimated costs for delivering CBT-I are provided in Table A.6.

Table A.6: Inputs to estimating the cost of CBT-I.

Input/assumption	Value	Source/Calculation
Digital CBT-I		*Calculated for approximately 80,000 people with insomnia in the target population over 5 years.*
Upfront digital investment	$1,000,000	Scaled Bedtime Window budget estimates provided by the Project Advisory Group.
Annual digital system maintenance	$100,000	
Annual promotion costs	$50,000	
Upfront clinician training to upskill clinical psychologists	$81,928	Calculated by estimating the maximum number of clinician full-time equivalent (FTE) required to deliver the service at any one time over the five years. This was based on digital CBT-I requiring 2.7 hours of clinician time per patient,[xix] and a staff turnover rate of 12%. The cost of this training was estimated based on the Australian Psychological Society CBT for insomnia certified skills course. The time required for this course by clinicians was assumed to be 50 per cent more than the professional development time (six hours) to account for self-learning and administration.
Variable staffing costs	$20,560,000 over 5 years, including $2,000,000 for project management, $1,400,000 for IT support and $17,160,000 for clinician support	Assumes 2 FTE are required for project management per year, and 2 FTE for IT support per year. The number of clinicians required are estimated to range between 10 FTE per year (Year 1) to 77 FTE per year (Year 5), depending on how many individuals take up digital CBT-I each year. The number of clinicians is calculated based on 2.7 hours of clinician time per patient.[xx] Salaries for each role were estimated using average salary amounts.[166]
Overhead accounting, insurance and legal costs	$1,065,500 over 5 years	Assumed to be 5% of ongoing variable costs.
Time cost for individuals receiving CBT-I	$72 per person	The estimated time to undergo digital CBT-I treatment was based on five 20-minute sessions as per the Bedtime Window program.[167] The value of this time was estimated using the ABS median hourly wage.[168]
Total digital CBT-I cost over 5 years	***$29,113,078***	***Calculated using methods described above.***

xix Draws on Bedtime Window program requirements and is based on a calculation using 10,000 patients and 15 FTE working 37.5 hour weeks for 48 weeks per year.

xx Draws on Bedtime Window program requirements and is based on a calculation using 10,000 patients and 15 FTE working 37.5 hour weeks for 48 weeks per year.

Table A.6: Continued

Input/assumption	Value	Source/Calculation
Clinician-delivered CBT-I		*Calculated for approximately 20,000 people with insomnia in the target population over 5 years.*
Individual clinician-delivered CBT-I cost per person	$2,053	Includes the sum of the cost for a GP mental health treatment plan referral on the MBS (item 2715) the estimated gap payment for a GP consultation to receive a mental health treatment plan, 6 CBT-I sessions with a psychologist on the MBS (item 80010) and the estimated gap payment for sessions independently set by a psychologist.[169] Approximately 19,855 individuals were estimated to access individual clinician-delivered CBT-I.
Group clinician-delivered cost per person	$720	The sum cost of individual clinician-delivered CBT-I was spread evenly across 10 individuals in a group, as advised by the Project Advisory Group (excluding the individual time cost for receiving treatment which was counted in full). Approximately 1,045 individuals were estimated to access group clinician-delivered CBT-I.
Upfront clinician training to upskill clinical psychologists	$91,743	Calculated by estimating the maximum number of clinician FTE required to deliver the service at any one time over the five years. This was based on clinician-delivered CBT-I requiring on average 11.5 hours of clinician time per patient,[xxi] and a staff turnover rate of 12%.[170] This cost of this training was estimated based on the Australian Psychological Society *CBT for insomnia certified skills course*.[171] The time required for this course by clinicians was assumed to be 50 per cent more than the professional development time (six hours) to account for self-learning and administration.
Time cost for individuals receiving CBT-I	$515 per person	The estimated time to undergo clinician-delivered CBT-I treatment was based on six one-hour sessions as advised by the Project Advisory Group, with some additional time for travel and waiting time. However, it is acknowledged that in practice, clinician-delivered CBT-I programs may vary in the time commitment required by individuals. The value of this time was estimated using the ABS median hourly wage.[172]
Total clinician-delivered CBT-I cost over 5 years	***$51,831,909***	***Calculated using methods described above.***

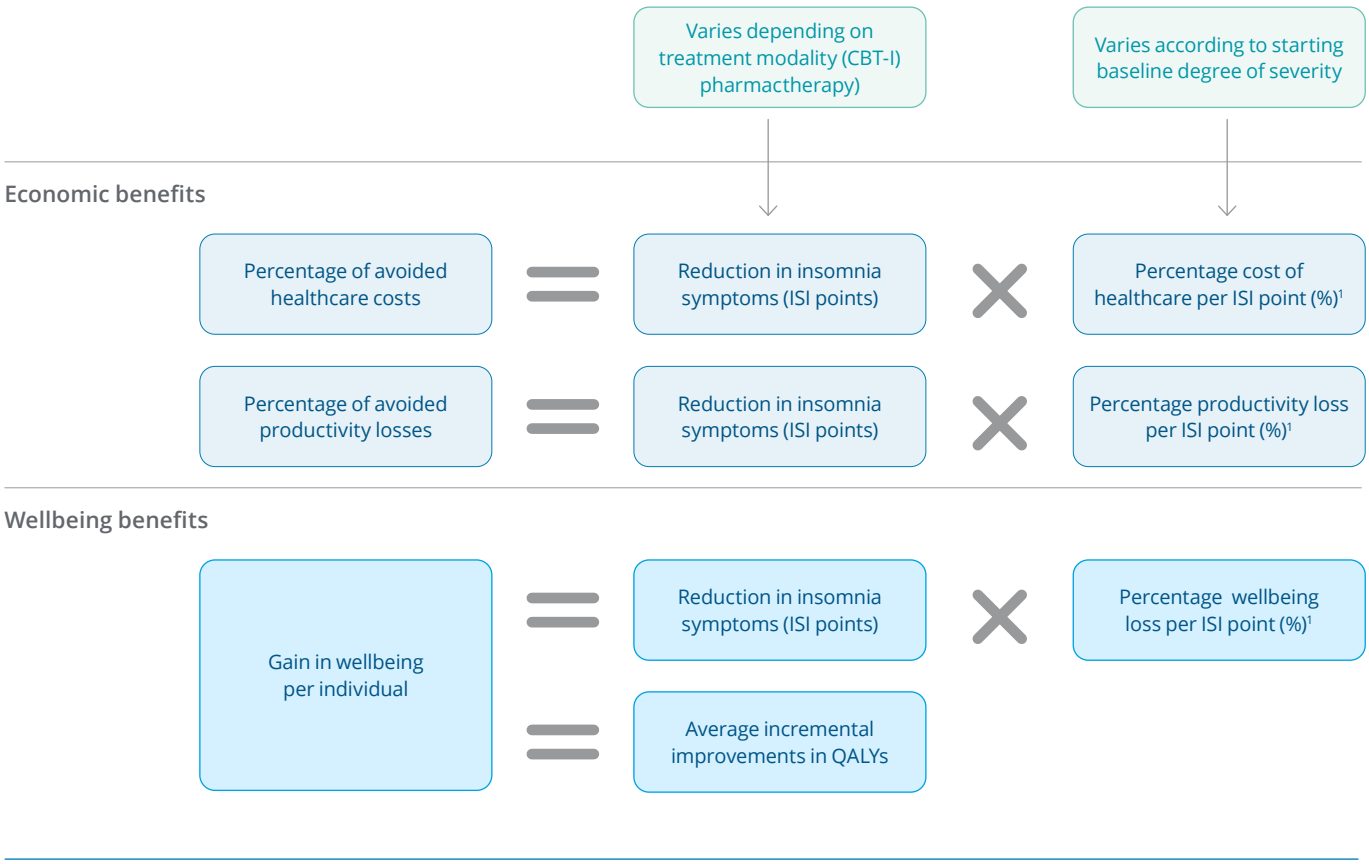
Source: Deloitte Access Economics and various sources.

xxi Calculated by assuming that clinician-delivered CBT-I requires a clinician to deliver 6 one-hour sessions, with some additional preparation and administrative time required for each session. A weighted average is taken across group and individual patients to establish the time required on a per-patient basis.

A.5. Estimating the benefits of CBT-I

A summary of the calculations used to estimate the benefit of CBT-I is shown in Figure A.1.

Figure A.1: Calculation to convert a reduction in insomnia to a change in costs



Source: Deloitte Access Economics.

A.5.2. Effectiveness of CBT-I and other treatment types in reducing insomnia symptoms

The estimated effectiveness of treatment types in reducing insomnia symptoms via the ISI and gaining QALYs is provided in Table A.7. In each instance, averages were taken across a range of relevant sources across Australia, the UK, US and Japan. Each measure was taken against a no treatment comparator.

Table A.7: Effectiveness of treatment types in reducing insomnia compared to no treatment

Treatment time	Value	Source/Calculation
Reduction in insomnia symptoms (measured by the decrease in ISI points)		
Digital CBT-I	6.20	Drawn from Fang et al. (2024),[174] Forma et al. (2022),[175] Hwang et al. (2025),[176] Simon et al. (2023),[177] Soh et al. (2020)[178] and Sweetman et al. (2024).[179]
Clinician-delivered CBT-I	6.75	Drawn from Fang et al. (2024),[178] Forma et al. (2022)[181] Hwang et al. (2025)[182] and Simon et al. (2023).[183]
Weighted average for CBT-I	*6.322*	*Calculation based on estimated suitability for digital and clinician-delivered CBT-I (see Table A.2).*
Pharmacotherapy	3.053	Drawn from De Crescenzo et al. (2022)[184] and Forma et al. (2022).[185]
Gain in QALYs		
Digital CBT-I	0.017	Drawn from Darden et al (2021),[186] Fang et al. (2024)[187] and Stokes et al. (2022).[188]
Clinician-delivered CBT-I	0.019	Drawn from Darden et al. (2021),[189] Fang et al. (2024)[190] and Natsky et al. (2022).[191]
Weighted average for CBT-I	*0.018*	*Calculation based on estimated suitability for digital and clinician-delivered CBT-I (see Table A.2).*
Pharmacotherapy	0.007	Drawn from Briggs et al. (2025),[192] Darden et al. (2021),[193] Ikeda et al. (2022)[194] and Snedecor et al. (2010).[195]

Source: See table.

A.5.3. Monetising the benefit of a reduction in insomnia symptoms

Sarsour et al. (2011) establishes the association between insomnia severity and health care and productivity costs.[196] Specifically, experiencing fewer insomnia symptoms decreases the economic cost burden of insomnia. Individuals with more severe insomnia at baseline experience a greater reduction in the cost burden than individuals with less severe insomnia.[197] By shifting an individual from one category of insomnia severity (measured by the ISI) to a less severe category, some health care costs are avoided and productivity is gained. The percentage change in the cost burden of insomnia for each ISI point reduction was calculated using this relationship. This estimated reduction in costs following a change in insomnia symptoms is shown in Table A.8.

For example, if digital CBT-I reduced insomnia symptoms on the ISI by 7 index points, moving an individual from moderate to subthreshold insomnia, and for each drop in ISI point in the moderate insomnia threshold health care costs decreased by 5 per cent, the individual's avoided health care costs would be:

Reduction in health care costs = 7 x 5% = 35%.

Table A.8: Relationship between a reduction in insomnia symptoms (ISI) and the reduction in cost burden of insomnia (% share of total cost burden of insomnia)

Year of intervention	Reduced health care cost	Reduced productivity losses	Reduced wellbeing losses
Subthreshold insomnia to no insomnia	16.54	25.07	20.81
Moderate insomnia to subthreshold insomnia	31.44	22.25	26.85
Severe insomnia to moderate insomnia	31.44	22.25	26.85

Source: Deloitte Access Economics, based on Sarsour et al. (2011).[198]

The 2021 Deloitte Access Economics *Rise and try to shine: the social and economic cost of sleep disorders in Australia* report estimated the health care costs and productivity losses associated with insomnia in Australia.[199] These estimates were converted to a per person cost of insomnia, inflating to 2025 values. Both direct costs of insomnia, and the costs associated with attributable conditions were included (see Table A.9). Attributable conditions were estimated to comprise 19 per cent of health care costs and productivity losses associated with insomnia in this analysis. Avoided wellbeing losses due to disability and premature mortality were also calculated using the same approach and data sources.

Table A.9: Cost burden of insomnia per person per year, untreated ($, 2025 values)

Cost category	Cost ($)
Health care costs	534.48
Productivity costs	9,236.37
Loss of wellbeing	27,271.16
Total cost burden of insomnia per person per year	37,042.01

Source: Deloitte Access Economics.[200]
Note: informal care costs, deadweight losses and other costs are excluded from these cost burdens.

The avoided health care costs and avoided productivity losses associated with each treatment type (e.g., digital CBT-I) were calculated by multiplying the percentage change in cost burden by the cost of insomnia per person and the number of ISI points by which an individual's insomnia severity was estimated to reduce by.

A.5.3.2. Persistence of benefits over time

Notwithstanding the rate of natural remission for insomnia over time in the counterfactual, it was assumed that the benefits of CBT-I would persist beyond the year of treatment. The rate of persistence was informed by Jernelov et al. (2022), which demonstrated an 83.7 per cent rate of persistence 10 years after receiving CBT-I treatment.[201] Tapering of benefits over time was assumed to be linear over the 10-year period. Benefits persistence was restricted to the five-year time horizon. This is shown in Table A.10, where the share of benefits accrued was further adjusted for by the treatment completion rate which further defines the rate of benefit accrual (see Appendix A.2) .

Table A.10: Key parameters related to insomnia remission and CBT-I benefits persistence

Year of intervention	1	2	3	4	5
Persistence of insomnia symptoms	100.00%	80.83%	72.76%	64.68%	58.30%
CBT-I benefits persistence	100.00%	98.37%	95.11%	93.48%	91.85%
Share of benefits accrued	100.00%	79.52%	69.20%	60.46%	53.54%

Source: Deloitte Access Economics, based on Morin et al (2020)[202] and Jernelov et al. (2022).[203]

B

Appendix B
Sensitivity analysis

B.1. Discount rate sensitivity analysis

Table B.1: Discount rate sensitivity analysis, economic cost-benefit analysis results ($ millions, PV)

Discount rate	3%	7% - central	10%
Benefits	168.23	149.66	137.65
Costs	45.31	40.81	37.89
Net present value	122.92	108.85	99.76
BCR	**3.71**	**3.67**	**3.63**

Source: Deloitte Access Economics (2026).

Table B.2: Discount rate sensitivity analysis, ICER results ($, PV)

Discount rate	3%	7% - central	10%
Digital CBT-I	5,396.63	4,871.87	4,531.74
Clinician-delivered CBT-I	32,407.38	28,922.09	26,668.15
Weighted average for all CBT-I	**11,533.28**	**10,335.91**	**9,560.97**

Source: Deloitte Access Economics (2026).

B.2. Time horizon sensitivity analysis

Table B.3: Time horizon sensitivity analysis, economic cost-benefit analysis results ($ millions, PV)

Time horizon	5 years – central	7 years	10 years
Benefits	149.66	254.73	363.84
Costs	40.81	20.95	-2.74
Net present value	108.85	233.78	366.58
BCR	**3.67**	**12.16**	**132.63**

Source: Deloitte Access Economics (2026).

Table B.4: Time horizon sensitivity analysis, ICER results ($, PV)

Time horizon	5 years – central	7 years	10 years
Digital CBT-I	4,871.87	3,879.21	3,003.19
Clinician-delivered CBT-I	28,922.09	23,029.11	17,828.59
Weighted average for all CBT-I	10,335.91	8,229.93	6,371.42

Source: Deloitte Access Economics (2026).

B.3. Uptake rate sensitivity analysis

Table B.5: Uptake rate sensitivity analysis, economic cost-benefit analysis results ($ millions, PV)

Uptake rate	Slow – central (6,250 individuals in year 1)	Moderate (10,500 individuals in year 1)	Fast (20,000 individuals in year 1)
Benefits	149.66	166.29	193.13
Costs	40.81	38.83	35.72
Net present value	108.85	127.46	157.41
BCR	3.67	4.28	5.41

Source: Deloitte Access Economics (2026).

B.4. Pharmacotherapy counterfactual sensitivity analysis

Table B.6: Pharmacotherapy counterfactual sensitivity analysis, economic cost-benefit analysis results ($ millions, PV)

Pharmacotherapy counterfactual	50% of target population use pharmacotherapy	Central: 90% of target population use pharmacotherapy; 12% of these use it more than recommended	50% of those using pharmacotherapy use it more than recommended
Benefits	162.29	149.66	108.65
Costs	52.23	40.81	3.72
Net present value	110.06	108.85	104.93
BCR	3.11	3.67	29.21

Source: Deloitte Access Economics (2026).

B.5. Reduction in the economic cost of insomnia due to CBT-I sensitivity analysis

Table B.7: Reduction in the economic cost of insomnia due to CBT-I sensitivity analysis, economic cost-benefit analysis results ($ millions, PV)

Reduction in the economic cost of insomnia due to CBT-I	25% reduction in cost burden of insomnia - central	10% reduction in cost burden of insomnia
Benefits	149.66	71.54
Costs	40.81	40.81
Net present value	108.85	30.74
BCR	**3.67**	**1.75**

Source: Deloitte Access Economics (2026).

Note: Percentage reductions in economic cost of insomnia refer to the cost reduction associated with the change in ISI points due to CBT-I (approximately one ISI category on average).

B.6. Distribution of insomnia severity sensitivity analysis

Table B.8: Distribution of insomnia severity sensitivity analysis, economic cost-benefit analysis results ($ millions, PV)

Distribution of insomnia severity	Australian-based primary care data distribution (more severe) - central	US-based Sarsour et al. (2011) distribution (less severe)
Benefits	149.66	144.38
Costs	40.81	42.19
Net present value	108.85	102.19
BCR	**3.67**	**3.42**

Source: Deloitte Access Economics (2026).

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Limitation of our work

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