



## Paying the Price, Second Edition

The economic and social impact of eating  
disorders in Australia

Butterfly Foundation

**February 2024**

**Deloitte**  
**Access Economics**

# Content warning

This report contains discussion of eating disorders and body image concerns. For support with eating disorders or body image concerns, call Butterfly Foundation's National Helpline 7 days a week, 8am-midnight (AEST/AEDT) on 1800 ED HOPE (1800 33 4673), chat online or email [support@butterfly.org.au](mailto:support@butterfly.org.au). In a crisis, call Lifeline on 13 11 14 or 000 in an emergency.

# Acknowledgement of Country

Deloitte and Butterfly Foundation acknowledge the Traditional Owners of Country throughout Australia and recognise their continuing connection to land, waters and culture. We pay our respects to their Elders past and present.

# Acknowledgement of lived experience

We acknowledge people with living and lived experiences of eating disorders, disordered eating, and body image concerns, including carers, families and supporters. We especially acknowledge the individuals who generously shared their lived experience wisdom for this report. Butterfly recognises the value of lived experience as a form of knowledge and a force for creating positive change to ensure that those living with an eating disorder can access care and support.

# Limitation of our work

## **General use restriction**

This report is prepared solely for the use of Butterfly Foundation. This report is not intended to and should not be used or relied upon by anyone else and we accept no duty of care to any other person or entity. The report has been prepared for the purpose of assisting Butterfly Foundation to estimate the economic cost of eating disorders in Australia. You should not refer to or use our name or the advice for any other purpose.

# Contributions to this report

Deloitte Access Economics and Butterfly Foundation (“Butterfly”) acknowledge the valuable input of many people to this report. Both Deloitte Access Economics and Butterfly are committed to an evidence-based approach in all our work. An Expert Advisory Panel was convened to have oversight of the research and development of the report, each member of which has generously provided their experience, expertise and time. We extend particular thanks to the following members:

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# Foreword

29 February, 2024

Butterfly Foundation today releases the second edition of *Paying the Price*, a comprehensive examination of the prevalence rates and economic costs of eating disorders in Australia. More than a decade has passed since the last comprehensive study on this subject, and the findings presented in this report underscore the urgent need for heightened awareness, intervention, and policy reform.

*Paying the Price 2024* comes at a critical time, shortly after the release of the National Eating Disorders Strategy 2023-2033 by the National Eating Disorder Collaboration.<sup>1</sup> Eating disorders are complex and pervasive mental health conditions that affect individuals across age groups, genders, and socioeconomic backgrounds. The landscape of these disorders is ever-evolving, and the data within this report paints a stark picture of their increasing prevalence since the publication of the first *Paying the Price* report in 2012.<sup>2</sup>

The findings in this report are still regularly quoted in the media, by government, and elsewhere, as highlighting a highly concerning and urgent situation. Sadly, although many have worked tirelessly to address these mental health conditions, as a society we must confront the sobering reality that more individuals are grappling with their devastating impact, and the toll on our collective wellbeing is reaching alarming proportions.

The pages that follow detail the current landscape of eating disorders in Australia, offering both an analysis of prevalence rates by presentation,

and a nuanced exploration of the economic and social costs associated with these conditions. The authors have compiled the most up-to-date and relevant information, providing policymakers, healthcare professionals, and the public with a comprehensive understanding of the scope and severity of this public health crisis.

While we welcome the Commonwealth Government's investments over recent years, this report demonstrates that further investment is desperately needed, in prevention as well as treatment and other support. The magnitude of the problem requires urgent action. In the ensuing years since the last *Paying the Price* report, the societal conversation around mental health has evolved significantly.

Eating disorders continue to be shrouded in stigma and misconceptions, hindering progress in prevention, early intervention, and effective treatment. *Paying the Price 2024* is a clear call to action, demanding our collective attention and commitment to dismantling the barriers that impede progress in addressing eating disorders in Australia.

This report sheds light on the increase in prevalence rates but also underscores the economic toll that eating disorders exact in Australia. The costs, both direct and indirect, are not just financial; they reverberate through our healthcare system, workforce productivity, and the overall fabric of our communities. As we grapple with the findings presented within these pages, we must recognise that the burden of eating disorders extends far beyond the individual and their loved ones, permeating every facet of our society.

The second edition of *Paying the Price* not only details the essential data relating to the state of eating disorders in Australia, but it also provides a platform for the voice of lived experience – both of individuals and carers – to provide an insight into the lives of the 1.1 million Australians who live with an eating disorder in Australia today.



A stylized, handwritten signature in blue ink, consisting of a series of loops and a long horizontal stroke.

**Michael Same**

Board Chair, Butterfly Foundation

As we confront the stark realities in *Paying the Price 2024*, Butterfly is calling for a united resolve to prioritise mental health, advocacy for policy reform, and a collaborative effort towards a future where no one needs to be alone in their struggle with an eating disorder.

To tackle this formidable challenge, we need a Federally-supported, multidimensional approach. We can no longer expect charities such as Butterfly Foundation to fund essential research to determine prevalence rates and economic costs, and to be able to deliver the services and programs required to help so many. As described in the National Eating Disorders Strategy, it is time for governments to invest in an effective, equitable and coordinated stepped system of care for eating disorders – addressing prevention, identification, initial response, treatment, and psychosocial and recovery support. Only then we will be able to help those suffering, and the people who love them, navigate their way to sustainable recovery.

The time to act is now, for the price we pay when we neglect the mental health of our nation is too high a cost to bear. It is my hope that this report serves as a catalyst for change—a catalyst to ignite conversations, inspire collaborative efforts, and mobilise resources to create a healthier, more supportive environment for all Australians.

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# Glossary

Acronym	Full name
2023	Financial year 2022-23
AAN	Atypical Anorexia Nervosa
AIHW	Australian Institute of Health and Welfare
AN	Anorexia Nervosa
ARFID	Avoidant/Restrictive Food Intake Disorder
BED	Binge Eating Disorder
BN	Bulimia Nervosa
COVID-19	Coronavirus-19
DALY	Disability-adjusted life year
DSM-5	Diagnostic Statistical Manual of Mental Disorders 5th Edition
ED	Eating disorder
etc	Etcetera
FY	Financial year
i.e.	That is
ICD-11	International Classification of Diseases 11th Edition
MBS	Medicare Benefits Schedule
NEDC	National Eating Disorder Collaboration
NSW	New South Wales
OSFED	Other Specified Feeding or Eating Disorder
PBS	Pharmaceutical Benefits Scheme
QALY	Quality-adjusted life year
UFED	Unspecified Feeding or Eating Disorder
VSLY	Value of a statistical life year
WA	Western Australia
YLD	Years lived with disability
YLL	Years of life lost



# Key insights

In 2023

There were

**1.1 million**

Australians living with an ED



**1,273**  
people died  
from EDs

This is equivalent to

**4.45%**

of the Australian population



The lifetime prevalence is

**10.5%**



Women are

**2x**

more likely than men  
to experience an ED



People aged 15-19 are

**2.7x**

more likely than the average  
Australian to experience an ED

The impacts of EDs are far reaching



People with an ED lose an additional  
**10 days of work** per year



People from regional areas spend an  
average of **\$975 per person to  
travel** to receive treatment per year



The average caregiver to a person with an  
ED provides **12.5 hours of care** per week



Every year, **30,000 healthy years of life**  
are lost to EDs

EDs are costly

The economic and social cost  
of EDs was

**\$66.9 billion**

in 2023



**36%\***  
increase  
from 2012

The per person cost of EDs  
was

**\$60,654**

in 2023



**13%\***  
increase  
from 2012

This total consist of:

## 1. Financial costs

**\$20.8 billion**



**\$251.4 m**

in health system costs



**\$18.1 b**

in productivity losses



**\$443.6 m**

in efficiency losses



**\$534.0 m**

in other financial costs

## 2. Non-financial costs

**\$46.1 billion**



**\$46.1 b**

in lost wellbeing

The cost of EDs is not shared evenly

The three largest bearers of these costs were:

**1. Individuals**

**2. Employers**

**3. Government**

\*2023 estimates are not directly comparable to 2012 estimates due to inflation and methodological changes.

# Executive summary

An estimated 1.1 million people had an eating disorder in the 2023 financial year and there were a further 1.7 million people who had an eating disorder in their lifetime. Women and young people aged 15-19 were more likely to have an eating disorder. The economic cost of eating disorders exceeded \$66.9 billion in the 2023 financial year, or \$60,654 per person with an ED.

Eating disorders (EDs) are a group of serious, complex and life-threatening mental illnesses often characterised by disturbances in behaviours, thoughts and attitudes to food, eating, and body weight or shape. EDs have detrimental impacts upon a person's life and result in serious medical, psychiatric and psychosocial consequences.

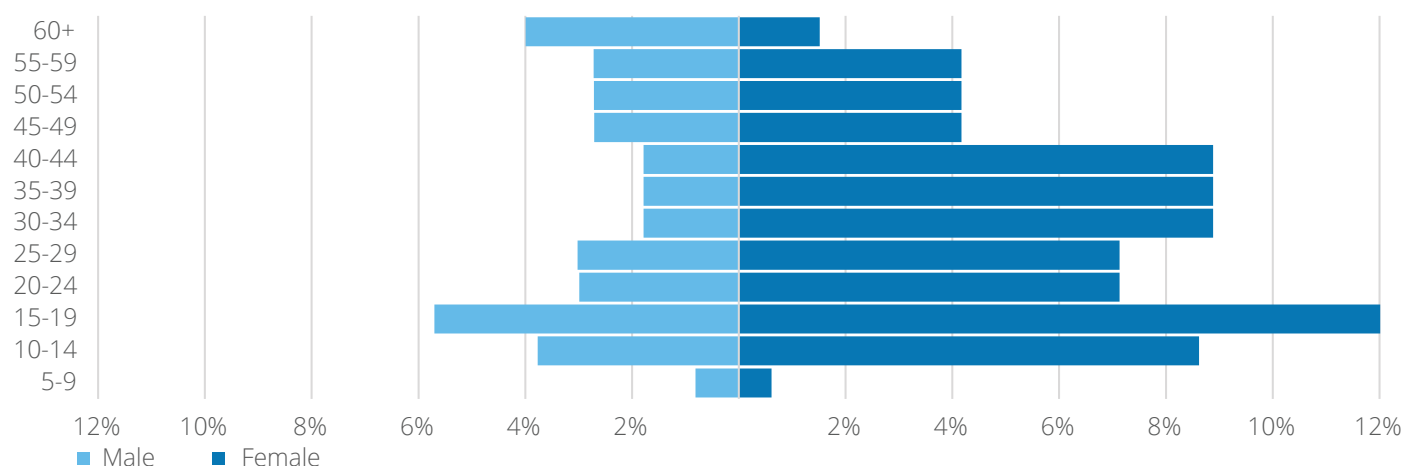
In 2012, Butterfly Foundation engaged Deloitte Access Economics to estimate the economic and social cost of EDs in Australia. The 2023 report uses

updated data and methodologies to estimate the economic cost of EDs in Australia in the financial year (FY) 2022-23 (henceforth referred to as 2023 throughout this report). Importantly, this study provides a more precise understanding of EDs by condition, age and sex.

There were 1.1 million or 4.45% of Australians living with an ED in 2023, increasing by 21% since 2012. This is equivalent to 1 in 23 people, with EDs being especially prevalent among women and adolescents.

Women were twice as likely as men to have an ED in 2023, and the increase in prevalence since 2012 was more pronounced for women than men. There was also an increase in people having EDs at younger ages, particularly among those aged 10-19 years. In 2023, 27% of those with an ED were 19 years or younger, compared to 15% in 2012 (Chart i).

**Chart i: Prevalence rates of EDs in Australia in 2023, by age and sex**



Source: Deloitte Access Economics

Of all EDs, Unspecified Feeding or Eating Disorder (UFED, 34%), Other Specified Feeding and Eating Disorders (OSFED, 27%) and Binge Eating Disorder (BED, 21%) were the most common, making up 82% of the total.

EDs have wide-ranging impacts on individuals and families, including death. In 2023, there were an estimated 1,273 deaths due to an ED in Australia. Mortality rates were highest among those with anorexia nervosa, compared to other conditions.

**The total economic and social cost of EDs was \$66.9 billion in 2023, equivalent to \$60,654 per person with an ED.**

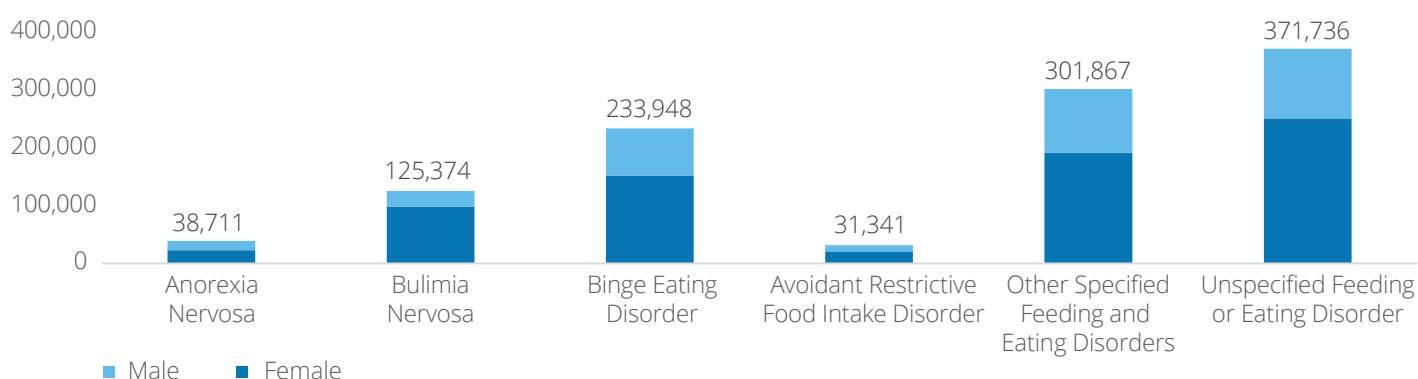
People with an ED access a range of health services including specialist mental health services, primary and community care and pharmaceuticals. Some require long periods in hospital or in a residential ED recovery centre. In 2021-22, there were almost 12,000 hospital stays for an ED with each stay averaging 11.3 days. The total health care cost in 2023 was estimated to be \$251.4 million, equivalent to \$760 per person with an ED who received treatment. This figure is likely an underestimate as

many people with an ED will not seek professional help, or will seek help for other reasons not coded in administrative datasets as an ED.<sup>3</sup>

65% of people with an ED were in the working age population (between 15 and 64 years old), with resulting productivity losses making up almost one third (27%) of total costs of EDs at \$18.1 billion. Based on lived experience, people with an ED found it challenging to maintain employment given the episodic nature of their condition, stigma, and lack of workplace support and accommodations. As a consequence, these individuals were more likely to stay in casual or part time work (compared to full time) than the general population.

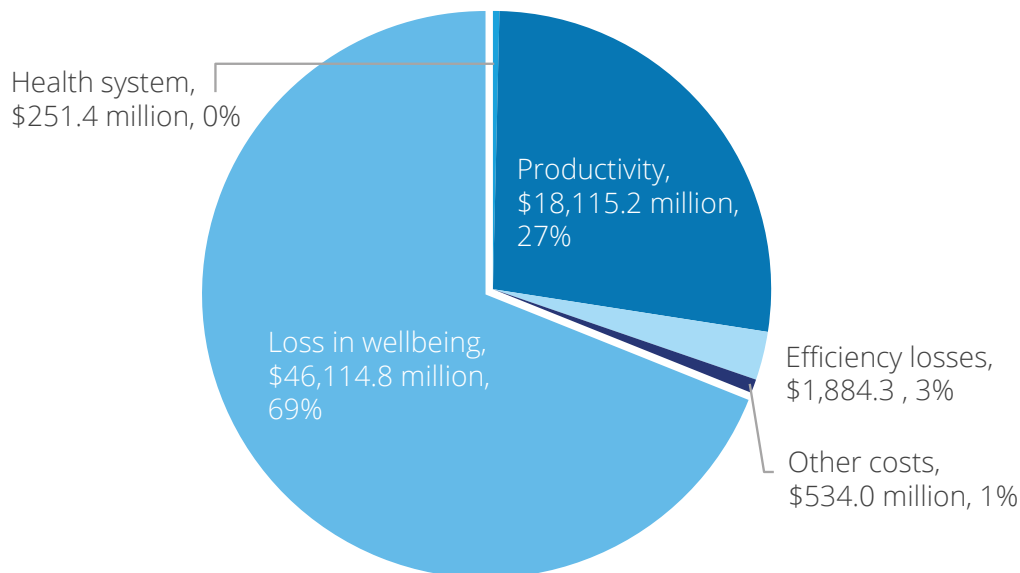
Efficiency losses accounted for \$1,884.3 million (3% of total costs). Other financial costs included groceries, travel, and accommodation costs, and made up \$534.0 million (1% of total costs). However, the most significant impact of eating disorders by far is on an individual's wellbeing – \$46.1 billion in 2023 (69% of total costs). This is equivalent to a total of approximately 136,700 years lived with a disability and 30,000 years of life lost, across individuals with an ED in Australia in 2023.

**Chart ii: Prevalence of EDs in Australia in 2023, by ED type and sex**



Source: Deloitte Access Economics

**Chart iii: Cost of EDs in Australia in 2023, by cost component**

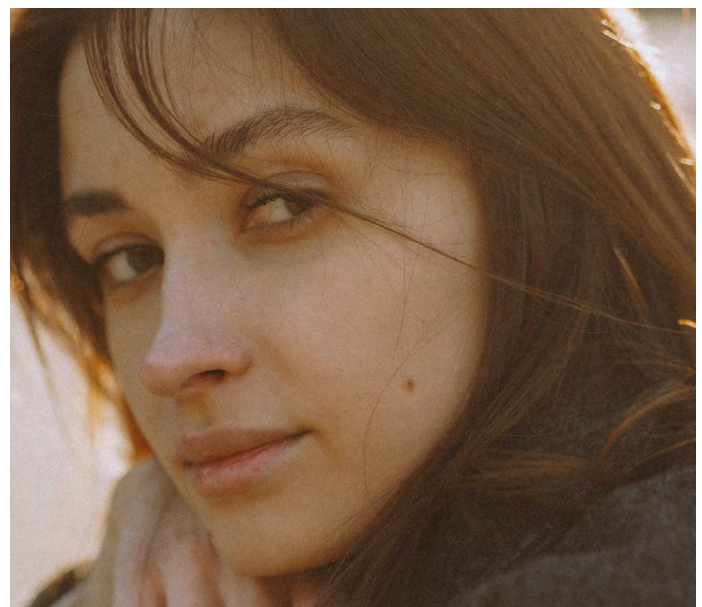


Source: Deloitte Access Economics

Consultations with people with lived experience presented a range of factors that contribute to the significant reduction in wellbeing caused by EDs. These include:

- Distress and worsened ED symptoms and other co-occurring conditions from restricted access to required care
- Distress stemming from an inability to meet fundamental needs due to financial insecurity, food insecurity and/or housing insecurity
- Trauma from receiving uninformed or inappropriate treatment
- Feelings of shame, discomfort or guilt from needing to rely on family and friends for financial and emotional support
- Increased obstacles in efforts to improve overall socioeconomic status, particularly in areas such as education and work
- An inability to engage fully in work, social events and/or hobbies

Literature shows that EDs can be a chronic and persistent illness for some individuals. Fewer than half of adults with Anorexia Nervosa (AN) and Bulimia Nervosa (BN) fully recover; an additional one-third improve but remain symptomatic; and up to one fifth stay chronically ill.<sup>4,5</sup> This suggests that people with EDs can experience losses in wellbeing that are sustained over the long term.



**Table i: Summary of costs in 2023 by cost type and ED type**

Cost	AN	BN	BED	Other	All
Health system (\$millions)	188.1	20.5	10.6	32.3	251.4
Productivity (\$millions)	714.3	2,289.1	4,306.3	10,805.5	18,115.2
Efficiency losses (\$millions)	126.4	241.1	439.0	1,077.8	1,884.3
Other (\$millions)	n/a	230.8	242.2	n/a	534.0
Loss in wellbeing (\$millions)	2,763.6	8,237.7	4,569.9	30,543.6	46,114.8
<b>Total (\$millions)</b>	<b>3,795.6</b>	<b>11,019.2</b>	<b>9,568.0</b>	<b>42,516.9</b>	<b>66,899.7</b>
Cost per person (\$)	98,052	87,890	40,898	60,312	60,654

Source: Deloitte Access Economics

## In like-for-like terms, the total cost of EDs has increased by 36% since 2012.

When accounting for inflation and key methodological changes summarised in the box (and holding all else constant), the total economic cost of EDs was \$49.2 billion in 2012 and \$66.9 billion in 2023.<sup>i</sup> This represents a 36% increase in total costs in real terms since 2012. The cost per person with an ED increased by 13% in real terms in the same period.

Of all the financial cost components, healthcare costs had the largest percentage increase (69% after accounting for inflation) since the 2012 report. This reflects growth in healthcare utilisation relating to EDs, particularly in the wake of COVID-19.<sup>6</sup> Recent research has found that the COVID-19 pandemic and associated stay-at-home orders grew the prevalence and severity of EDs, limited access to ED supports and increased the use of high-intensity healthcare supports.<sup>7, 8, 9</sup>

### Updated methodology

There were key changes to the methodology compared to the 2012 Deloitte Access Economics report *Paying the Price*, based on updated best practice approaches and the availability of new data. These include:

- 01. Updated mortality:** The 2012 report calculated excess mortality by comparing the mortality rate for those with an ED to the mortality rate of the general population. The method was highly sensitive to age causing deaths amongst younger cohorts to be overestimated and deaths among older cohorts to be underestimated. The updated method for calculating premature ED mortality uses a hazard ratio which isolates the additional risk of death for those with an ED and can be consistently applied across all ages, providing a complete and more accurate estimate.
- 02. Updated disability weights:** In the 2012 report, a disability weight of 0.28 was applied to all EDs.<sup>10</sup> However, recent studies have found the impact of EDs on individuals' wellbeing differs significantly by type of ED. As a result, the 2023 report utilises updated disability weights estimated for each type of ED. These disability weights range from 0.045 to 0.224.<sup>11</sup>
- 03. Removal of funeral costs:** Funeral costs are the bring-forward costs of holding a funeral for individuals who die prematurely due to their ED. In line with current best practice, this cost was not included in the 2023 estimates.

<sup>i</sup> Note: This is a 'like-for-like' 2012 cost estimate, adjusted for inflation and methodological changes. As such, it differs from the total cost estimate included in the 2012 report.





Australia can prevent and minimise the impacts of EDs by investing in better surveillance data via a national, longitudinal prevalence study, improving access to holistic and affordable care for people living with an ED, implementing preventative campaigns, and tailoring care to different types of EDs.

This research highlighted various opportunities to reduce the prevalence of EDs in Australia, contribute to a more nuanced understanding of the various ED types, and minimise associated impacts and costs.



This research found that the largest financial cost of EDs in Australia is productivity costs, making up 87% of total financial costs, with the majority (65%) of those with an ED in the working-age population (i.e., aged between 15 and 64 years old). The lived experience panel also identified challenges with obtaining and retaining employment due to the episodic nature of EDs, which, in-turn, makes it difficult to afford treatment. This can lead to those with an ED not getting the level of care they need, or sometimes failing to seek care altogether (indeed, research suggests that just 30% of those with an ED seek help).<sup>13</sup> Over time, this can increase health costs as an individual's symptoms may become more severe while they wait to access community-based care, forcing them to present to the emergency department.<sup>14</sup> Investment is needed to improve access to care for people living with an ED through greater financial support. In particular, this report notes that several items commonly prescribed to those with EDs are not included on the Pharmaceutical Benefits Scheme (PBS) for EDs, such as lisdexamfetamine, agomelatine, and vortioxetine.



There is a lack of available data on the prevalence of eating disorders in Australia, split by condition, age, sex and more. The most recent Australian estimates, from Hay et al. (2017),<sup>12</sup> leverages a South Australian sample of approximately 5,700 people. In this report, the prevalence figures draw on information from multiple sources (including international data) given the lack of local data. A longitudinal, population-wide study on EDs in Australia would provide a more detailed measure of the prevalence of EDs by condition, as well as changes over time. This should include a focus on priority cohorts (e.g., gender-diverse, neurodivergent, culturally and linguistically diverse, and Aboriginal and Torres Strait Islander communities).



Early identification and intervention can prevent more severe cases of EDs from developing, reducing the costs associated with EDs. This is especially important given that the prevalence

of EDs among younger cohorts is increasing. For example, 27% of those with an ED in 2023 were 19 years or younger in age, marking a significant increase from 15% in 2012.

This suite of opportunities builds on Australia's *National Eating Disorders Strategy 2023-2033*, which outlines several improvements that could be made to ED treatment in Australia including a greater focus on early intervention, holistic service delivery and culturally inclusive and trauma-informed care.<sup>17</sup>



Those with AN account for just 6% of those with an ED in Australia, yet comprise 75% of the health system costs estimated in this report. In contrast, the majority of the productivity and wellbeing costs can be attributed to those with OSFED and UFED. This, coupled with insights from the lived experience panel around difficulties in clinicians being able to recognise and identify some presentations of EDs, indicates that access to health services for people with presentations outside of AN could be improved. This includes offering tailored treatment programs and educating clinicians on the possible different presentations of EDs and associated comorbidities.



The overall cost of EDs in Australia, at \$66.9 billion, is likely to still underestimate the true cost of EDs. In particular, those with an ED may utilise services that are not specific to their ED and, therefore, not be captured in the data. This may include, for example, bariatric surgery,<sup>15</sup> diet foods and diet pills.<sup>16</sup> A greater understanding of the attributable costs, in particular across different presentations of EDs, would be helpful to provide a more complete picture of the attributable impacts of EDs.



# 1 Introduction

Eating disorders (EDs) are a group of psychiatric disorders characterised by high levels of weight and shape concern that drive behaviours designed to control eating, weight, and shape.<sup>18</sup> They can result in severe and life-threatening physical and mental health complications.<sup>19</sup>

While EDs have historically been perceived to primarily impact women and girls,<sup>20</sup> they impact individuals of different gender identities, racial, cultural, linguistic and ethnic backgrounds, physiologies, ages, socioeconomic statuses, and locations.<sup>21</sup>

There are extensive social and economic costs associated with EDs. In 2012, Deloitte Access Economics was commissioned by Butterfly Foundation (Butterfly) to develop the report *"Paying the Price: The economic and social impact of eating disorders in Australia"* which quantified the economic and social costs of EDs in Australia for the first time.<sup>22</sup> However, there has since been limited insight into the economic and social costs of EDs in Australia using updated data and research, updated definitions of ED diagnosis, and consideration of COVID-19.

Deloitte Access Economics was engaged by Butterfly to produce a report on the social and economic costs of EDs in Australia in 2023. The report incorporates the most recent data, evidence, and methodologies, and describes changes over time using cost estimates from the 2012 report, adjusted for comparability.

## 1.1 Definitions

There are different types of EDs which have been defined in the International Classification of Diseases 11th Edition (ICD-11) and the Diagnostic Statistical Manual of Mental Disorders 5th Edition

(DSM-5). These definitions have evolved over time as data collection and understandings have become more sophisticated. It is important to note that these definitions are not representative of all ED presentations and pathways to development, particularly for culturally and racially marginalised individuals and individuals with different physiologies.<sup>23, 24</sup>

### 1.1.1 Anorexia Nervosa

Anorexia Nervosa (AN) is defined through the presence of significantly low body weight for the individual's height, age, and developmental stage that is not due to another health condition or to the unavailability of food. This low body weight is due to persistent behaviour patterns to prevent weight gain such as restricted eating, purging behaviours, misuse of laxatives and/or excessive exercise, and is generally accompanied by a fear of weight gain. Those experiencing AN will generally demonstrate an excessive preoccupation with low body weight whilst also self-perceiving their body weight or shape to be normal or even excessive.<sup>25</sup>

### 1.1.2 Bulimia Nervosa

Bulimia Nervosa (BN) is defined through frequent, recurrent episodes of binge eating (e.g., once a week over a period of at least one month) which is subsequently accompanied by repeated compensatory behaviours to prevent weight gain. As with AN, individuals with BN are likely to be excessively preoccupied with their body weight and shape which can strongly influence their self-perception.<sup>26</sup>

### 1.1.3 Binge Eating Disorder

Binge Eating Disorder (BED) is defined through frequent, recurrent episodes of binge eating. Unlike BN, BED episodes are not regularly followed by compensatory behaviours to prevent weight gain.



As with BN, individuals feel a loss of control during binge eating episodes and this disorder can lead to severe impairment in relationships and other psychosocial functioning.<sup>27</sup>

#### **1.1.4 Avoidant/Restrictive Food Intake Disorder**

Avoidant/Restrictive Food Intake Disorder (ARFID) is defined through the avoidance or restriction of food intake that results in significant weight loss, dependence on oral nutritional supplements, or tube feeding. Distinct from AN and BN, those exhibiting ARFID behaviours are not preoccupied with their body weight or shape.<sup>28</sup>

#### **1.1.5 Unspecified Feeding or Eating Disorder and Other Specified Feeding or Eating Disorder**

Other Specified Feeding or Eating Disorder (OSFED) and Unspecified Feeding or Eating Disorder (UFED) are common types of EDs and have been included in the scope of this report. OSFED is defined as the presentation of ED characteristics which do not meet the full criteria of other well-defined EDs like AN, BN, and BED, alongside the distress or impairment typically associated with EDs. There are different diagnoses that fall under OSFED, including Atypical Anorexia Nervosa (AAN), BN (of low frequency and/or limited duration), BED (of low frequency and/or limited duration), Purging Disorder, and Night Eating Syndrome (NES). UFED is defined as the presentation of feeding and eating disorder symptoms that cause clinically significant distress or impairment in social, occupational or other important areas of functioning. However, these symptoms do not meet the full criteria for other eating or feeding disorders. UFED is often used where there is insufficient information to make a more specific diagnosis (e.g., in an emergency room setting).<sup>29</sup>

Pica and rumination-regurgitation disorder are listed in both ICD-11 and the DSM-5 but have been excluded from the scope of this report as they are considered solely feeding disorders. There are other EDs beyond these formal definitions which people can experience such as orthorexia and disordered

eating. Orthorexia is characterised by an obsession with the quality and health benefits of unprocessed foods.<sup>30</sup> Orthorexia is not officially listed as a diagnosable ED and there is no universally shared definition.<sup>31</sup> Disordered eating is characterised through the symptoms and behaviours of other EDs but at a lower level of severity or frequency.<sup>32</sup>

### **1.2 This report**

This report was informed by multiple data sources. Primary data was collected through consultation with, and a survey of, individuals with lived experience of EDs who provided evidence of their experience with health costs, productivity losses, and other social and financial costs. Secondary data was collected through desktop research and a literature review, which included data from the Australian Institute of Health and Welfare (AIHW), the Australian Bureau of Statistics (ABS), the 2012 Deloitte survey conducted on behalf of Butterfly Foundation and a range of academic papers (e.g., Samnaliev et al. 2015 and Santomauro et al. 2021).<sup>33, 34</sup> Secondary data and preliminary findings were tested with the Expert Advisory Panel, who provided additional advice, data, and insights based on current research.

The rest of this report is structured as follows:

- Chapter 2 outlines the methodology to quantify the social and economic costs of EDs in an Australian context using both qualitative and quantitative data.
- Chapter 3 exhibits the prevalence and mortality figures for EDs in Australia.
- Chapter 4 presents financial costs of EDs in Australia.
- Chapter 5 discusses the non-financial costs of EDs in Australia.
- Chapter 6 provides an in-depth discussion of the results including a comparison to the 2012 report.



## 2 Approach

This chapter provides an overview of the approach used to quantify the social and economic costs of EDs in Australia.

The aim of this study was to estimate the economic and social cost of EDs to Australia in the financial year (FY) 2022-23 (referred to as 2023). This was estimated using a cost-of-illness methodology based on a prevalence approach, whereby the costs within 2023 are assigned to those with an ED within the same year.

Under this framework, the costs associated with EDs are considered including those borne by individuals, families and carers, government, and society. Financial costs include health system costs, productivity costs and other financial costs. Non-financial costs include a loss of wellbeing. The per person costs associated with EDs are then multiplied by the relevant number of people with an ED for each category of costs to determine a total cost for Australia in 2023.

The following sub-sections describe the approach to estimating these components and the sources of information used to inform the methodology.

### 2.1 Prevalence and mortality

#### 2.1.1 One-year prevalence

One-year prevalence is the number of individuals with a condition at any time during the reference year. To derive the one-year prevalence of EDs in Australia, two key sources were used: Qian et al. (2022) and Hay et al. (2017).<sup>35, 36</sup> These sources were prioritised because Hay et al. (2017) uses Australian data and Qian et al. (2022) is the most recent meta-analyses study. This selection ensures the estimates

are both reliable and relevant to the Australian context. Using two studies rather than one also helps account for uncertainty in individual estimates and accommodates for large data variations.

The prevalence rate estimates from both sources for each ED type were averaged where possible. For the ED types that only have a prevalence rate estimate from one source, benchmarking was used to ensure alignment with the averaged estimates. This allows prevalence to be consistently compared across ED types.

The prevalence rates by sex were estimated by applying the sex breakdowns of AN, BN and BED provided by Qian et al (2022).<sup>37</sup> An average across the three were applied to the other ED types. It is therefore assumed that the pattern of ED prevalence for men to be lower than women is consistent across ARFID, OSFED and UFED. The limited evidence available is supportive of this assumption.<sup>38, 39</sup>

The distribution of ED prevalence by age was derived using prevalence rates from Udo and Grilo (2018) and AIHW hospital admissions data (2022).<sup>40, 41</sup> Udo and Grilo (2018) is the most recent study on ED prevalence that provides prevalence rates by age groups. As the study did not consider those under 18, hospital admissions data for those under 18 were benchmarked to the Udo and Grilo (2018) estimates. Where estimates were not provided for a particular ED type, an average across the estimates available were used. Those under 5 years old were excluded as no hospital admissions data was available for those below the age of one and figures were very limited for those aged 1 to 5.

For more information on estimating one-year prevalence, see Appendix A.1.

### 2.1.2 Lifetime prevalence

Lifetime prevalence is the number of individuals that have experienced a specific condition at some point within their life, both formally diagnosed and undiagnosed.

There is limited evidence on the ED lifetime prevalence rate within Australia. The most recent Australian estimate of ED lifetime prevalence is from a 2012 report from the National Eating Disorders Collaboration (NEDC).<sup>42</sup>

To provide a more recent estimate of lifetime prevalence, the results from a review commissioned by the InsideOut Institute have been used.<sup>43</sup> As the review only provides ranges for each ED type and the rates vary significantly across studies, the midpoint has been calculated to estimate lifetime prevalence.

### 2.1.3 Mortality

Those with an ED are at an increased risk of mortality.<sup>44</sup> Medical complications are the leading cause of death among those with AN followed by suicide.<sup>45</sup> Co-morbidity with conditions such as anxiety, substance and alcohol abuse, and mood disorders can result in the mortality from EDs to be hidden amongst other causes.<sup>46</sup> To accurately capture ED mortality, the increased all-cause risk must be considered.

Accordingly, the mortality approach used in this report involves taking the hazard ratio from a recent study (Demmler et al., 2020) and applying these to current prevalence estimates.<sup>47</sup> As Demmler et al. (2020) does not provide hazard ratios by age, it is assumed that the premature mortality rate amongst those with an ED is constant across all ages and the premature mortality rate from an ED for all Australians differs in-line with prevalence.

Importantly, mortality estimates in this report are not directly comparable to previous research on the economic and social costs of EDs by Deloitte Access Economics in 2012. The previous report applied a deaths per thousand persons mortality rate to an age-sex matched population to compare deaths within the population with an ED to expected deaths from other causes, estimating that there were 1,829 attributable deaths in 2012. Adopting a similar approach and applying it to 2023 prevalence figures yields an estimated 2,278 deaths in 2023.

For more information on estimating mortality, see Appendix A.2.

## 2.2 Financial cost types

### 2.2.1 Health system costs

Individuals with EDs incur significant health costs, as EDs are chronic illnesses with a high number of co-occurring conditions that can require ongoing treatment.<sup>48, 49</sup> Costs to treat EDs vary by treatment type, treatment setting, and ED type.<sup>50</sup> For example, AN has the second highest mortality rate of all mental illnesses (following substance and alcohol abuse disorder), resulting in higher treatment costs compared to other EDs and most mental illnesses.<sup>51</sup>

There are a range of treatment options available in Australia for individuals with EDs. These include outpatient and inpatient services, specialised residential treatment centres, day programs, and at home care.<sup>52</sup> These treatment options are offered in both public and private settings with a range of models of care to treat individuals safely. One example is Wandi Nerida in Queensland, which is Australia's only specialist residential ED recovery centre and is owned and operated by Butterfly. It is a private 13-bed hospital which offers a model of care involving phases of treatment tailored to individual needs for more efficient and effective recovery.<sup>53</sup> Medicare also offers ED Treatment and Management Plans which include 20 subsidised sessions with a dietitian and 40 subsidised sessions with a mental

health clinician over a 12-month period. People experiencing EDs can also access treatment through either a Mental Health Care Plan, and/or a Chronic Disease Management Plan. These are accessible through referral from a General Practitioner.<sup>54</sup>

The following components of health expenditure are captured in the health system costs for this study:

- Hospital services
- Out-of-hospital medical expenses
- Prescription pharmaceuticals
- Residential care costs at Wandí Nerida
- Other health costs (e.g., community and public health programs, health administration and health aids).

### 2.2.1.1 Methodological approach

A top-down approach to costing was the preferred choice for estimating the health costs associated with EDs. The key advantage of a top-down methodology is that it ensures cost estimates across diseases are consistent and that the sum of the parts does not exceed the whole (total health expenditure in Australia).

Estimates for direct health system costs relating to EDs are derived in Australia by the Australian Institute of Health and Welfare (AIHW) and include payments from all sources of funds, such as the Australian and state and territory governments, Private Health Insurance, and out-of-pocket payments by patients.<sup>55</sup> They cover hospital services (including public and private services), out-of-hospital expenses (consisting of primary healthcare and referred medical services) and prescription pharmaceuticals.

AIHW health costs were taken from FY 2018-19 as FY 2019-20 data was affected by COVID-19 lockdowns, which limited access to ED supports and increased their severity and incidence.<sup>56, 57</sup> However, since FY 2018-19, healthcare costs relating to EDs are likely to have increased for two reasons. First, in early FY 2019-20, 64 new Medical Benefits Schedule (MBS) item numbers became available to support people with EDs through ED Treatment and Management Plans.<sup>58</sup> Second, since the COVID-19 pandemic, evidence suggests that ED healthcare utilisation has increased.<sup>59, 60</sup> To account for this growth, FY 2018-19 health costs were scaled up by the growth in ED patient days in hospital and out-of-hospital visits (e.g., psychologist visits).<sup>61, 62</sup>

Residential care costs accrued in private healthcare facilities are not included in AIHW disease expenditure estimates. As such, they were estimated separately based on data requested by Butterfly and received from Wandí Nerida. Wandí Nerida is the only private residential care facility currently operating in Australia, though several are under construction. The box on the *B-FREEDT model of residential care* provides further information on Wandí Nerida and how it compares to other ED treatment services.

### **B-FREEDT model of residential care**

The Butterfly Foundation Residential ED Treatment (B-FREEDT) is an innovative model of residential care for an Australian context that is delivered at Wandí Nerida, Australia's only specialist residential ED private hospital. The model of care was developed with a set of general principles for the treatment of EDs which are universally accepted in contemporary best practice clinical care and described in detail in the Royal Australian and New Zealand College of Psychiatrists clinical practice guidelines. Treatment at Wandí Nerida using the B-FREEDT model of care costs \$1,650 per night per bed (at time of writing). Conversely, a hospital day program costs \$519 per day and an in-patient hospital stay of 12 weeks costs \$1,515 per night per bed for minor complexity services, or \$1,690 per night per bed for major complexity services.

An economic evaluation found evidence to suggest that the B-FREEDT model of care was more costly but had greater benefits when compared to the hospital day program. The B-FREEDT model of care may be associated with overall lower health service use, costs, and increase of productivity at follow up. Moreover, Wandí Nerida residents who accessed the B-FREEDT model of care demonstrated a faster improvement in their ED symptoms (as measured by the ED examination questionnaire), when indirectly compared to a day program. However, the evaluation found that this is not a value-for-money option when implemented at the population level (adopting healthcare and societal perspectives) and a willingness to pay threshold of \$96,000 per quality-adjusted life year (QALY) gained. Cost-effectiveness results improved when benefits were assumed to have a longer duration (e.g., up to 5 years) or when costs were reduced by up to 50%.

Compared to other services for ED treatment such as hospital day programs and inpatient services which are largely paid for by either federal or state governments, there are significant out-of-pocket costs for those who accessed Wandí Nerida. As such, the responsibility to cover the cost to attend Wandí Nerida was mostly borne by the individuals who attended the centre. A third of residents were able to shift the treatment costs to private health insurance. Residents also had the option to receive bursaries from the program to cover up to two-thirds of their treatment costs which were funded by the centre and other not-for-profit organisations or charities.

For more information on health system costs, see Appendix B.1.1.

#### **2.2.1.2 Limitations**

The estimated health costs included in this report are likely to underestimate total healthcare spending on EDs due to gaps in AIHW's disease expenditure data. Specifically, AIHW doesn't include private out-of-hospital services (i.e., a visit to a counsellor that isn't at least partially funded by Medicare), pharmaceuticals that are not at least partially covered by the PBS for EDs, or weekly private health insurance fees.

Further, it is assumed that the split of ED spending by ED type (e.g., AN, BN and other) is equivalent to the split in hospitalisations. However, patterns of healthcare spending may differ significantly to hospitalisations. For example, people with AN may make up a higher portion of hospitalisations than healthcare spending. If this is the case, then the attribution of healthcare spending to type of ED may not be accurate.

Similarly, ED healthcare costs may have grown at a rate dissimilar to the growth in ED patient days and out-of-hospital visits between FY 2018-19 and FY 2021-22. In which case, total healthcare spending in 2023 may differ to that estimated.

#### **2.2.2 Productivity costs**

Due to the life-threatening and life-limiting impacts of EDs and the need for support, individuals with EDs may experience significant impacts to their participation and performance in both paid and unpaid work compared to individuals with EDs.<sup>63</sup> In particular, individuals with EDs may experience disruptions to their work productivity and work attendance, and participation in the workforce.<sup>64, 65</sup> This varied significantly between ED types, where individuals with AN and BN were more likely to be impacted by productivity costs compared to individuals with BED.<sup>66</sup>

The specific costs considered in this report are reduced employment, absenteeism, presenteeism, premature mortality, search and hiring costs and informal care.

### 2.2.2.1 Methodological approach

A human capital approach was adopted to estimate productivity losses. This involves the calculation of the attributable difference in employment of people with an ED compared to that of the general population, multiplied by average weekly earnings (AWE).

The human capital approach assumes that workers have a value equal to their earnings, however, it is noted that a human life is more valuable and significant than employment and financial contribution, and these calculations are in no way meant to reduce human worth to productivity and capital. The need for these calculations reflects the wider goal of estimating the financial impact of EDs on those affected by them, and the need for early intervention and greater resource allocation to EDs services.

There are **six types of productivity losses** relating to EDs:



#### Reduced employment

Where a worker exits the workforce or reduces their hours due to the impacts associated with their eating disorder. This cost estimates the earnings lost by people who were forced to exit the workforce or reduce their hours due to their ED. It is calculated by multiplying the number of people with EDs by the reduction in employment attributable to EDs and the average yearly earnings. It is important to note that stigma, a lack of workplace accommodations and limited NDIS recognition of EDs may limit the ability of individuals with EDs to remain in employment and/or access support.



#### Absenteeism

Where a worker may be unwell more often and take time off work due to the impacts of their ED, while remaining in the workforce. This cost captures the value of the work time missed due to their ED by multiplying days missed by average daily earnings.



#### Presenteeism

Where the impact of an ED on an individual's physical, psychological, and emotional wellbeing may disrupt their productivity. This cost captures the loss in productivity due to an ED by multiplying the estimated loss of productive time by average yearly earnings (excluding earnings during sick leave and annual leave).



#### Premature mortality

When a person's expected lifetime earnings are forgone after their loss of life due to their ED. It is estimated by multiplying the number of premature deaths due to EDs with lifetime expected earnings. It is noted that the intention of this calculation is not to reduce the meaning, gravity, and value of the human lives it represents.



#### Search and hiring

The process involved following the death of an employee due to their ED, where a business begins a process of searching for, hiring, and training a new employee at an unexpected time. It is calculated by multiplying the number of premature deaths by the employment rate of people with an ED and the bring-forward cost of replacing an employee. It is noted that this calculation is not intended to minimise or erase the emotional impact of losing a colleague due to an ED.



#### Informal care

Where an individual (generally a family member or friend) partially or completely foregoes participation in the paid labour force to provide care to someone experiencing an ED. This cost captures the opportunity cost of providing informal care, which is measured by what the carer could have earned had they been in the workforce (e.g., if adequate support had been available for their family member or friend without the need for informal supports). Other costs related to informal care such as the social and health impacts of caring for someone with an ED are not captured. Further information on informal care and their experiences is provided below. It is noted that this calculation is one of many intended to highlight the urgent need for greater support, resources, and accessible treatment for individuals experiencing EDs and their caregivers.



### Informal care

Informal caregivers provide care to individuals with an ED outside of the formal care sector. They are typically a family member, friend, or partner of the person receiving care, and usually live in the same household as the individual experiencing an ED. Having family members and loved ones included in an individual's ED treatment plan holds significant value, particularly in ensuring that the individual's best interest is prioritised and in helping with decision making.<sup>67</sup> However informal care is not free despite being unpaid, as time spent on informal care could be spent on paid work, leisure or other activities. Caring for people with EDs can place an economic strain on caregivers, who may need to reduce time in employment.<sup>68</sup> Survey respondents who provided care to those living with an ED noted that they reduced their work hours to part-time or casual hours to ensure that they could continue to undertake caring responsibilities such as attending appointments or providing support at home.

A meta-synthesis of qualitative studies looked at the social and health impacts of providing informal care to individuals with EDs. It found caregiving had a pervasive impact on family members, affecting their relationships, sense of identity, physical, emotional and mental health. This often resulted in lower levels of mental health and other unmet needs.<sup>69</sup> Looking after one's own mental wellbeing was highlighted to be essential when caring for someone with an ED.<sup>70</sup> This may include staying connected with family and friends, asking for help in sharing caring responsibilities and attending therapy to process feelings of fear, grief and exhaustion.

The lived experience consultation revealed that the main economic cost of informal care was paying for ED care and treatment. Those who shared their lived experience insights for this report highlighted how their parents had paid for their inpatient treatment by accessing their superannuation, private health insurance, and their life savings. Surveyed carers also mentioned costs related to supporting their own mental health due to financial strain and the stress of caring for a loved one with an ED.

For more information on estimating productivity costs, including the calculations and inputs used, see Appendix B.1.2.

#### 2.2.2.2 Limitations

Several productivity inputs included in this report were taken from a 2012 Deloitte survey conducted on behalf of Butterfly, due to a lack of more recent data. If EDs have become more severe since 2019, the impact of EDs on an individual's productivity may have also worsened.

Inputs were also taken from a US source (Samnaliev et al. 2015). There may be societal, economic, and demographic differences between Australia and the United States that could lead to variation in an individual's likelihood of withdrawing from the workforce.

#### 2.2.3 Efficiency losses

EDs generate health care costs and reduce income tax revenues (through lower productivity). As such, taxation rates must be higher to achieve a neutral budget position. This additional tax and subsidy

revenue is not an economic cost but a transfer of payments from one individual to another. However, increasing tax revenue reduces the efficiency with which the economy's resources are used. For example,

- An increase in income tax rates will increase the relative price of work compared to leisure and therefore create a disincentive to work.
- An increase in the sales tax increases the price of goods and services, resulting in a loss of sales.

Consequently, there is an associated reduction in consumer and producer surplus. Efficiency losses capture the reduced economic efficiency (i.e., this reduction in consumer and producer surplus) associated with the need to levy taxes to fund the provision of government services and replace lost employment taxes.<sup>ii</sup>

ii For the purposes of this report, 'efficiency losses' represent what are elsewhere sometimes referred to as 'deadweight losses'.

### 2.2.3.1 Methodological approach

There are four types of efficiency losses relating to EDs:



#### Consumer taxes

Where workers limit their employment or take unpaid sick leave due to the impacts of their ED, reducing the personal income tax received by government and incurring an associated efficiency loss.



#### Company taxes

Where businesses lose revenue due to their worker taking sick leave for an ED or becoming less productive at work due to the impacts of their ED, reducing the company tax received by government and incurring an associated efficiency loss.



#### Government health expenditure

Where governments increase taxation revenue to fund health system costs associated with EDs, incurring an efficiency loss.



#### Other government programs

Where governments increase taxation revenue to other government programs associated with EDs (e.g., Disability Support Pension and Jobseeker payment), incurring an efficiency loss.

For information on the calculations and inputs used to estimate the efficiency losses associated with EDs, see Appendix B.1.3.

### 2.2.3.2 Limitations

The main limitation associated with this estimation of efficiency losses for EDs is a lack of current available data. Several inputs included are relatively dated (pre-2017). However, it is unlikely that there have been significant changes in the efficiency losses associated with various tax types. As such, Deloitte Access Economics has confidence in the efficiency losses estimation.

### 2.2.4 Other financial costs

Other financial costs consist of aids, equipment and home modifications, alternative and herbal medications, transport and accommodation costs, and miscellaneous out-of-pocket costs not included in other cost categories. The other

financial costs included in this report are travel and accommodation costs faced by Australians with an ED who live in regional and remote communities, and the additional grocery costs associated with binge and purge behaviours and restrictive eating (i.e., safe foods) in BED, BN and AN.

### 2.2.4.1 Methodological approach

People with an ED who live in regional and remote areas may need to travel and/or pay for accommodation to receive specialised treatment. According to the Deloitte survey conducted in 2012, the median amount spent on travel and accommodation per year is \$750. This is adjusted for inflation and multiplied by the number of Australians with an ED who live in regional and remote areas.

The conditions of BED and BN include binge eating episodes, where individuals experience an uncontrollable urge to consume a large amount of



food in a short period of time. The purchasing of these large food volumes is costly – according to Crow et al. (2009), 32% of all food costs of people with BN are related to their ED.<sup>71</sup> The estimated additional grocery costs per person was then multiplied by the number of people with BN and BED. Binge and purge behaviours are also experienced by individuals with AN (i.e., anorexia nervosa binge-purge subtype), however estimates of food costs related to binge eating episodes in AN is limited and was beyond the scope of this report.

For more information on other financial costs, including the calculations and inputs used, see Appendix B.1.3.

#### **2.2.4.2 Limitations**

Other financial costs are typically out-of-pocket individualised costs. As such, there was a lack of recent detailed literature available on the type of different costs and their magnitude that could be drawn on for this report and these may be underestimated.

### **2.3 Non-financial cost types**

#### **2.3.1 Loss of wellbeing**

As outlined in Section 2.1.3, individuals with EDs experience serious symptomology and high rates of mortality, resulting in a significant loss in wellbeing.<sup>72</sup>

##### **2.3.1.1 Methodological approach**

The burden of disease methodology is a non-financial approach to quantifying the loss of wellbeing, where life and health are measured in terms of disability-adjusted life years (DALYs). While the use of DALYs is current best practice for estimating the wellbeing impacts of health conditions, it is a crude calculation of disability and health status. Use of these calculations is not intended to imply that there is a hierarchy of health status, or that diversity or changes in health status (i.e., chronic illness, disability) indicate a loss of human value. Further, it is noted that DALYs do not capture important factors such as stigma, minority

stress and marginalisation that may significantly affect the health of disabled and chronically ill individuals in multiple complex ways.

DALYs combine the years of healthy life lost due to living with a disability (YLD) and the years of life lost due to premature death (YLL). One DALY (the summation of YLD and YLL) is equivalent to one year of healthy life lost. DALYs can be converted into a dollar figure using an estimate of the value of a statistical life year (VSLY), an estimate of the dollar value society places on an anonymous life. The Department of Prime Minister and Cabinet (2022) estimated the net VSLY (that is, subtracting financial costs borne by individuals) to be \$227,000 in 2022 Australian dollars.<sup>73</sup>

In the burden of disease methodology, various health states are assigned a disability weight score, where zero represents no health loss and one is equivalent to total health loss (i.e., death). Other health states are given a calculated weight between zero and one to reflect the loss of wellbeing from a particular condition relative to no health loss. For example, a disability weight of 0.2 is interpreted as a 20% loss in wellbeing relative to no health loss for the duration of the condition.

The loss of wellbeing that occurs due to EDs can be calculated using the following formulas:

- $\text{DALYs} = [\text{YLDs (disability weight} \times \text{prevalence)} + \text{YLLs (deaths due to EDs} \times \text{discounted standard life expectancy at the average age of death)}]$
- $\text{Loss of wellbeing} = \text{DALYs} \times \text{VSLY}$

##### **2.3.1.2 Limitations of this approach**

There was a lack of recent evidence on mortality rates as a result of EDs. As a result, the mortality weights for EDs were taken from a 2011 source. The estimates included in this source may not reflect the 2022 mortality rate of EDs if severity levels have shifted over time.

Further, there is emerging evidence that DALYs are underestimated for EDs in the literature due to the misattribution of deaths related to EDs to other causes and miscalculation of the non-fatal disability associated with EDs.<sup>74</sup> This suggests that the estimates of lost wellbeing included in this report could underestimate the true cost of EDs.

Finally, the enormous variation in the severity of EDs cannot fully be captured by an average disability weight. For many Australians, EDs would have a much larger impact on their personal wellbeing.

## 2.4 Lived experience

Insights from those with lived experience of an ED were incorporated throughout the report alongside the modelling results. This provides additional context and helps to fill important gaps where data is limited. These insights were gathered from two sources, a lived experience survey and a lived experience consultation group.

A survey on health costs, productivity losses and other social and economic costs was circulated to members of Butterfly's lived experience online reference group, the Butterfly Collective. This survey received responses from 29 members across New South Wales (NSW), Victoria and Western Australia (WA). All members either currently have and/or previously had an ED or cared for someone with an ED. Butterfly Foundation was responsible for conducting the survey and provided a thematic summary of the results which has been used within this report.

Butterfly Foundation convened a Lived Experience Consultation Group to explore economic and social impacts and to further advise on the representation of lived experience within the report. The consultation was conducted by Butterfly with questions developed in consultation with Deloitte Access Economics.





# 3 Epidemiology of eating disorders

Approximately 1.1 million or 4.45% of Australians aged 5 and over had an ED in 2023. EDs are most prevalent amongst those 15 to 19 years old but can occur at any age. Those with an ED have a higher mortality risk, resulting in an estimated 1,273 premature deaths in Australia in 2023.

This section presents the results of calculating the prevalence of EDs in Australia in 2023 and the resulting premature mortality. Prevalence and mortality are presented by ED type, sex and age within to highlight how EDs typically present and which cohorts are most affected.

## 3.1 One-year prevalence

### 3.1.1 Prevalence by ED type

One-year prevalence reflects the number of people in a given year who have an ED. Modelling for this report finds that 4.45% of the Australian population aged 5 and over had an ED in 2023. This is equivalent to 1.1 million Australians. The prevalence breakdown by ED type is presented in Table 3.1. The broader ED types, OSFED and UFED, have the highest prevalence rates at 1.22% and 1.50% respectively. ARFID and AN are least prevalent at 0.13% and 0.16%, respectively. However, the ARFID prevalence estimate is likely to be underestimated. Research on prevalence for ARFID is particularly limited as it was only first included within the DSM-5 in 2013.<sup>75</sup> As ARFID typically first presents in childhood, general population ED studies that exclude children in the sample likely do not fully capture its prevalence.<sup>76</sup>

**Table 3.1: Prevalence of EDs in Australia in 2023, by ED type**

	AN	BN	BED	ARFID	OSFED	UFED	All EDs
Prevalence rate	0.16%	0.51%	0.94%	0.13%	1.22%	1.50%	4.45%
Prevalence count	38,711	125,374	233,948	31,341	301,867	371,736	1,102,977

Source: Deloitte Access Economics

Research suggests that only 31% of people with an ED seek formal treatment.<sup>77</sup> In this report, evidence from general population representative studies is used to offer a more comprehensive estimate of ED prevalence in Australia. However, it should be noted that the findings are constrained by the specific diagnostic criteria for EDs.

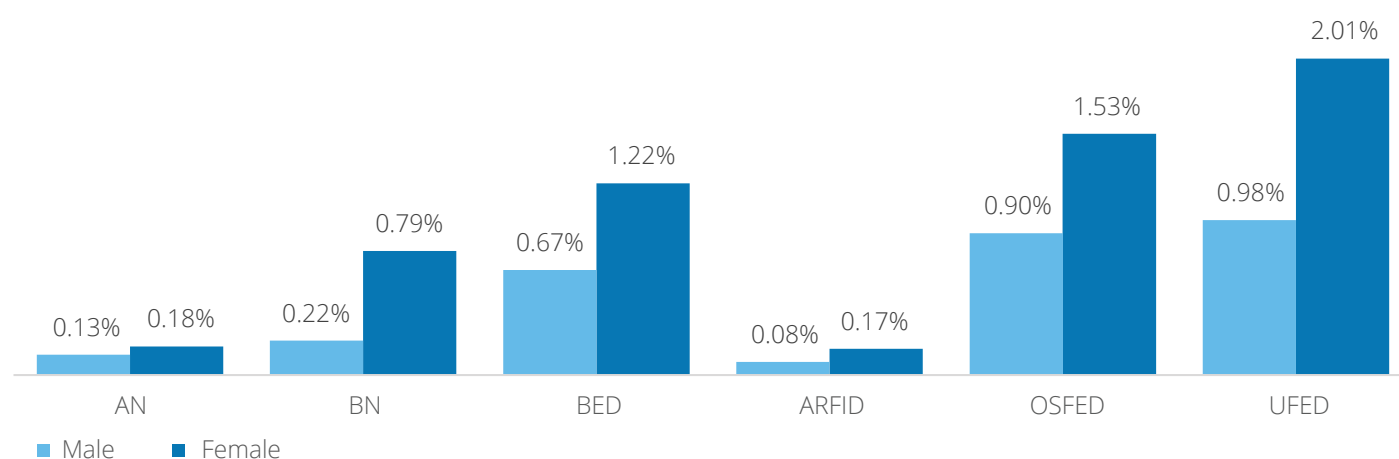
In both the consultation and survey involving individuals with lived experience of EDs, receiving a correct diagnosis was raised as a key issue. Some individuals experienced delays or were excluded from receiving accurate ED diagnoses due to the strict eligibility criteria. This issue holds significant implications for accessing suitable care. In the absence of a diagnosis, individuals struggling with an ED may be turned away from services and will not be able to access financial support through the Medicare rebate.

### 3.1.2 Prevalence by sex

EDs are present among both men and women, despite common misconceptions.<sup>78</sup> The modelling for this report finds that EDs are more prevalent in women, comprising of 67% of those aged 5 and over with an ED in Australia. Consistent with other research, this report finds that approximately one third of Australians struggling with an ED are male.<sup>79</sup> However, it should be noted that research suggests men are less likely to be assessed and diagnosed for their ED and are less likely to seek treatment.<sup>80</sup>

Although prevalence is consistently higher for women, the sex composition of those with EDs varies by ED type (Chart 3.1). The differences in prevalence by sex is most pronounced for BN and BED. BED prevalence in women is approximately double that in men (1.22% and 0.67%, respectively) and the difference in prevalence for BN is even greater (0.79% and 0.22%, respectively).

**Chart 3.1: One-year prevalence rates of EDs, by ED type and sex**



Source: Deloitte Access Economics



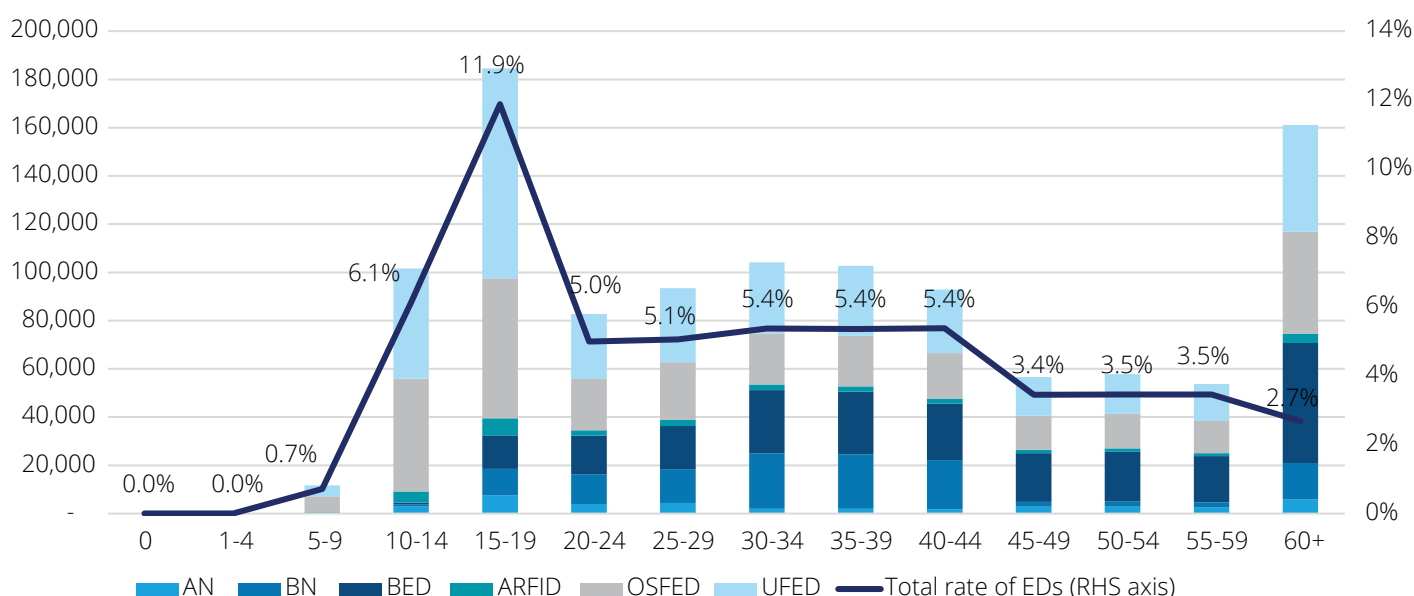
### 3.1.3 Prevalence by age

ED prevalence initially increases with age and is the highest among those 15–19 years old where 12% or 184,551 had an ED in 2023 (Chart 3.2). ED prevalence then declines as age increases. AN, ARFID, OSFED and UFED share a similar pattern, whereby the prevalence rate is the highest among adolescence and decreases onwards. Prevalence of BN is

distributed more evenly across those above 15 and is the greatest for those 30–40 years old.

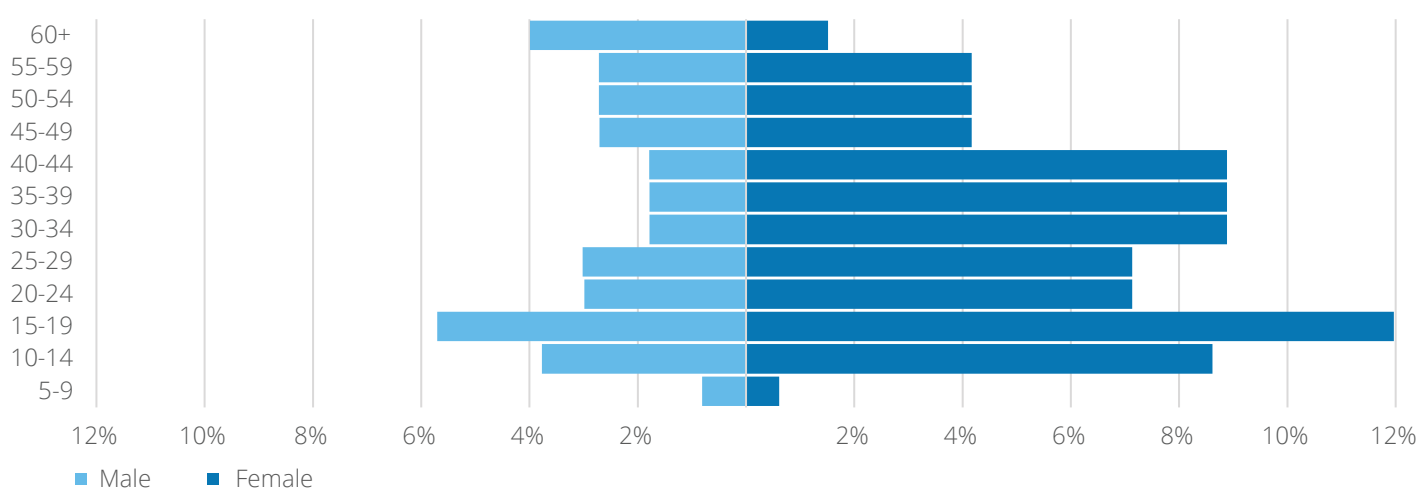
The prevalence rate distribution for both men and women are characterised by higher rates for the 15–19 age group followed by a declining trend by age (Chart 3.3). The prevalence rate for men however begins to steadily increase again for those over 45 years old.

**Chart 3.2: Prevalence of EDs in Australia in 2023, by age and ED type**



Source: Deloitte Access Economics

**Chart 3.3: Prevalence rate of EDs in Australia in 2023, by age and sex**



Source: Deloitte Access Economics

The available evidence allows for the analysis of ED prevalence by age and sex. However, it is important to acknowledge that there are additional individual characteristics beyond these demographics that contribute to the likelihood of developing an ED. The available data and study results limit the capacity to capture these nuanced factors within prevalence figures. To address this limitation, additional research information is provided in the box on the *intersectional pathways to the development of EDs*.

**Intersectional pathways to the development of EDs**

While the prevalence estimates in this report represent an average, it is important to note there are different groups at a higher risk of developing an ED.

There are significant gender differences in the development of EDs. For example, transgender and gender-diverse individuals are at a higher risk of experiencing an ED compared to cisgender individuals.<sup>81, 82</sup> This heightened risk can be attributed to various reasons, such as efforts to suppress physical characteristics of biological sex or to accentuate features of gender identity.<sup>83</sup>

Moreover, neurodivergent individuals are more likely to experience EDs compared to neurotypical individuals due to heightened desires for control, selective eating tendencies and sensory processing difficulties.<sup>84</sup>

People from culturally and racially marginalised backgrounds often experience distinct pathways to ED development compared to their Caucasian counterparts. For example, experiences of racism and the historical and current social value placed on white-centred beauty ideals alongside the internalised requirement to align with these norms can lead to the development of EDs.<sup>85, 86, 87</sup>

**3.2 Lifetime prevalence**

The ED lifetime prevalence rate is the proportion of the population who have had an ED at any point in their life. Noting the uncertainty and large variation in lifetime prevalence estimates for EDs, Deloitte Access Economics has taken the midpoint of the analysis from the InsideOut Institute (Table 3.2).<sup>88</sup> This indicates that the overall lifetime prevalence of eating disorders is 10.46% of the population. This suggests that 2,754,446 Australians in 2023 have had an ED at any point within their life.

The results represent a 1.46 percentage point increase from 2012 when it was conservatively estimated that Australian lifetime prevalence for EDs was 9%.<sup>89</sup> The increase in lifetime prevalence is consistent with the increasing trend in twelve-month prevalence revealed in this report. The findings indicate that lifetime prevalence is highest for OSFED at 6.05%. This is followed by BED, BN and AN (2.20%, 1.85% and 1.8%, respectively). Lifetime prevalence for UFED is the lowest at 0.45%. There are limited studies on the prevalence of ARFID and therefore an estimate has not been included in Table 3.2. The most recent lifetime prevalence estimate for ARFID is 0.5% but this was estimated using a sample of 7–14-year-olds.<sup>90</sup> Similar to twelve-month prevalence, lifetime prevalence is more prevalent amongst women compared to men across all ED types.<sup>91, 92</sup>

**Table 3.2: Range of lifetime prevalence estimates of EDs, by ED type**

	AN	BN (%)	BED (%)	ARFID (%)	OSFED (%)	UFED (%)	Any ED (%)
Range	0-3.6	0.1-3.6	0.7-3.7	N/A	0.6-11.5	0-0.9	1.2-19.7
Midpoint	1.80	1.85	2.20	N/A	6.05	0.45	10.45

Source: InsideOut Institute (2022) and Deloitte Access Economics

### 3.3 Mortality

It is estimated that the average premature all-cause mortality rate for those with an ED is 0.12% which equates to a total of 1,273 deaths in Australia in 2023 for those aged 5 or over. Out of all the ED types, AN has the highest premature mortality rate at 0.14% of those with AN. The premature mortality rate is particularly high for women with AN at 0.19% (Table 3.3). However, the number of premature deaths are greater for BED, OSFED and UFED as these EDs are more prevalent (Table 3.4).

These estimates were calculated using a hazard ratio. The hazard ratio considers the increased

likelihood of death among those with an ED compared to a control group. All causes of death are therefore considered. This includes any medical complications directly related to their ED and co-occurring conditions or deaths from other causes such as suicide. The hazard ratio was converted into a mortality rate for those with an ED and then applied to the ED prevalence counts to estimate the total premature mortalities from EDs.

By dividing the total ED premature mortalities by the population in 2023, it is estimated that 0.01% of the total population of Australia aged 5 and over died prematurely due to having an ED.

**Table 3.3: ED population premature mortality rate, by sex and ED type**

	AN	BN	Other EDs
Female	0.19%	0.05%	0.14%
Male	0.07%	0.10%	0.12%
<b>Total</b>	<b>0.14%</b>	<b>0.06%</b>	<b>0.12%</b>

Source: Deloitte Access Economics

Note: The hazard ratio for 'Other eating disorders' from Demmler et al. (2020) was used for BED, ARFID, OSFED and UFED resulting in their premature mortality rate being the same.<sup>93</sup>

**Table 3.4: Premature mortality for those aged 5 and over with an ED in Australia in 2023, by ED type**

	AN	BN	BED	ARFID	OSFED	UFED	All EDs
ED premature mortality count	54	77	285	38	369	451	1,273
Percent of total ED mortality	4%	6%	22%	3%	29%	35%	100%

Source: Deloitte Access Economics



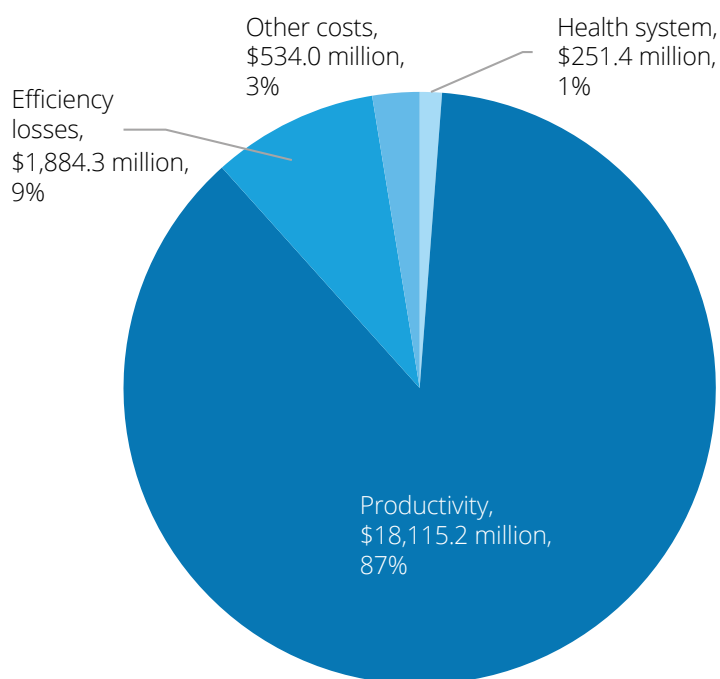
# 4 Financial costs

There are a range of financial costs attributable to EDs in Australia, accounting for \$20.8 billion in 2023.

EDs have an enormous and wide-ranging impact on the financial position of individuals, their families and carers, governments, and society. In 2023, the estimated financial cost of eating disorders was \$20.8 billion, or \$18,844 per person with an eating disorder.

Productivity costs made up most of this cost (\$18.1 billion, 87% of total financial cost), reflecting the substantive impact EDs have on working productivity, and that 65% of people with an ED are in the working age population (i.e., between 15 and 64 years old). Efficiency losses accounted for \$1.9 billion (9%), followed by other financial costs (\$534.0 million, 3%) and health system costs (\$251.4 million, 1%).

**Chart 4.1: Cost of EDs in Australia in 2023, by cost component**



Source: Deloitte Access Economics

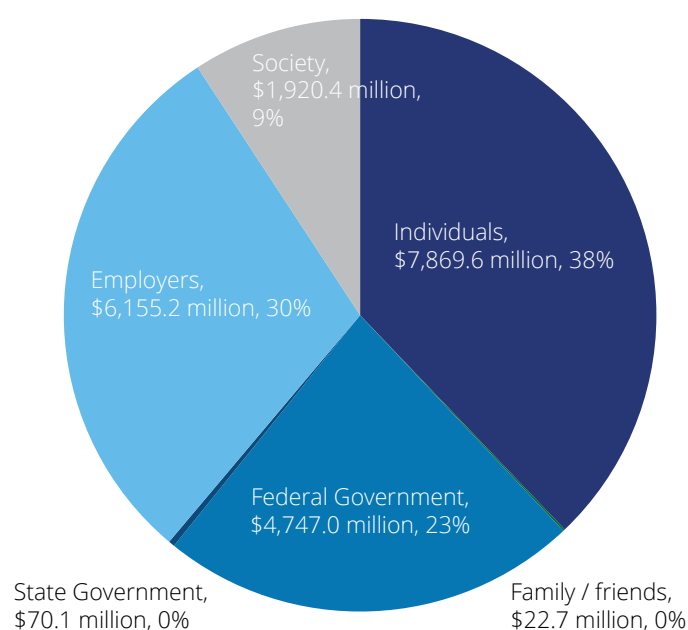


**Table 4.1: Financial costs due to EDs by cost component in 2023**

	<b>AN (\$millions)</b>	<b>BN (\$millions)</b>	<b>BED (\$millions)</b>	<b>Other (\$millions)</b>	<b>All (\$millions)</b>	<b>Cost per person (\$)</b>	<b>Percent of total (%)</b>
Health system	188.1	20.5	10.6	32.3	251.4	228	1%
Productivity	714.3	2,289.1	4,306.3	10,805.5	18,115.2	16,424	87%
Efficiency losses	n/a	230.8	242.2	n/a	534.0	484	3%
Other costs	126.4	241.1	439.0	1,077.8	1,884.3	1,708	9%
<b>Total</b>	<b>1,032.0</b>	<b>2,781.5</b>	<b>4,998.1</b>	<b>11,973.3</b>	<b>20,784.9</b>	<b>18,844</b>	<b>100%</b>

Source: Deloitte Access Economics

Individuals bore the most significant portion (\$7.9 billion, 38%) of the \$20.8 billion in total financial costs, followed by employers (\$6.2 billion, 30%) and the Federal Government (\$4.7 billion, 23%). Society<sup>iii</sup> (\$1.9 billion, 9%), State and Territory Governments (\$70.1 million, less than 1%), family and friends of people with EDs (\$22.7 million, less than 1%).

**Chart 4.2: Financial cost due to ED by bearer in 2023**

Source: Deloitte Access Economics

<sup>iii</sup> Society refers to a range of actors including insurers, consumers, and producers.

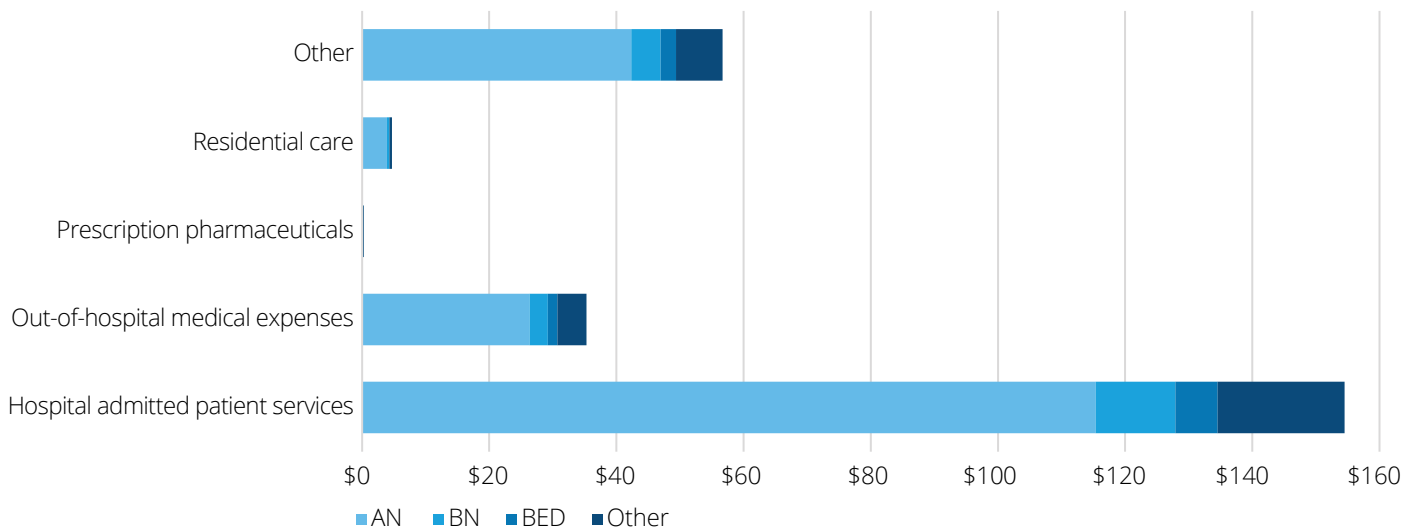
4.1 Health Costs

The 2023 total health system costs attributable to EDs is estimated to be \$251.4 million in Australia.

Health system costs include hospital admitted patient services, out-of-hospital medical expenses (e.g., psychologist and GP visits), prescription pharmaceuticals, residential care at Wandi Nerida and other health costs (e.g., community and public health programs, health administration and health aids).

In total, health system costs were estimated to be \$251.4 million in Australia in 2023, equivalent to \$228 per person with an ED or \$760 per person with an ED who received treatment (see Chart 4.3 and Table 4.2). Hospital admitted patient services made up the largest proportion of health system cost, an estimated \$154.5 million (61% of the total cost). Other health costs accounted for \$56.7 million (23%), out-of-hospital services for \$35.3 million (14%), residential care at Wandi Nerida for \$4.7 million (2%) and prescription pharmaceuticals for \$0.2 million (less than 1%).

Chart 4.3: Health system costs due to EDs by cost component in 2023 (millions)



Source: Deloitte Access Economics

**Table 4.2: Health system costs of EDs in 2023, by type of health cost**

	<b>AN (\$millions)</b>	<b>BN (\$millions)</b>	<b>BED (\$millions)</b>	<b>Other (\$millions)</b>	<b>All (\$millions)</b>	<b>Cost per person (\$)</b>	<b>Percent of total (%)</b>
Hospital admissions	115.4	12.6	6.6	20.0	154.5	140	61
Out-of-hospital	26.3	2.9	1.5	4.6	35.3	32	14
Prescription pharmaceuticals	0.1	0.0	0.0	0.0	0.2	0	0
Residential care	3.9	0.4	-	0.4	4.7	4	2
Other	42.3	4.6	2.4	7.3	56.7	51	23
<b>Total</b>	<b>188.1</b>	<b>20.5</b>	<b>10.6</b>	<b>32.3</b>	<b>251.4</b>	<b>228</b>	<b>100</b>

Source: Deloitte Access Economics

As shown in Table 4.3, AN accounts for a majority of health system costs – an estimated \$188.1 million (75% of the total cost). Other EDs make up the next largest portion (\$32.3 million, 13%), followed by BN (\$20.5 million, 8%) and BED (\$10.6 million, 4%).

AN also has the highest per person cost (\$4,859), followed by BN (\$163). This primarily reflects the high service utilisation of people with AN. People with AN make up 75% of all days in hospital for EDs.

**Table 4.3: Health system cost of EDs in 2023, by ED type**

	<b>AN</b>	<b>BN</b>	<b>BED</b>	<b>Other</b>	<b>All</b>
Total cost (\$millions)	188.1	20.5	10.6	32.3	251.4
Percent of total (%)	75	8	4	13	100
Per person cost (\$)	4,859	163	45	46	228

Source: Deloitte Access Economics

The data used to quantify the health system costs in this report is an incomplete portrayal of the reality of living with an ED in Australia. In particular, it does not capture all of the out-of-pocket expenses incurred

by individuals with an ED while accessing healthcare. The *Health costs* box provides deeper insights on the financial burdens faced by those with an ED by using a lived experience lens.

## Health costs

Most lived experience survey respondents have incurred financial costs from accessing healthcare. Despite the increased availability of financial support through the introduction of the Medicare Better Access Initiative, individuals with EDs still commonly face out-of-pocket costs. It was noted that the available schemes and rebates are insufficient to cover the frequency and the multidisciplinary nature of care that would be required for recovery. Requiring a GP referral to access specialised ED services adds further to associated costs.

Some out-of-pocket health costs are not captured within the health cost estimates. In particular, a key gap in the AIHW healthcare expenditure data relates to pharmaceuticals not covered by the PBS. There are a range of medications commonly prescribed to people with EDs that are not currently approved for people with EDs under the PBS. In some instances, these medications are covered for other conditions; for example, lisdexamfetamine is covered for ADHD but not for EDs. This creates excessive out-of-pocket costs for people with EDs, which have not been captured in the modelling for this report.

According to the lived experience survey, individuals with an ED pay an average of \$100 to \$300 per week on out-of-pocket healthcare expenses. One individual emphasised that despite accessing the Eating Disorder Treatment and Management Plan (EDTMP), they still incurred around \$7,500 of out-of-pocket expenses per year.

Large out-of-pocket health costs are particularly prevalent among those living with a long and enduring eating disorder. The survey highlighted that these individuals often face difficulties in accessing healthcare services such as psychology sessions at the required frequency, as these sessions would go beyond the costs covered by an EDTP or Mental Health Plan. The lack of financial support for individuals living with enduring eating disorders reduces their ability to access care, which can worsen the severity of their ED and increase the risk of developing secondary physical and mental health conditions.

Furthermore, consultations revealed that many were not able to receive adequate care through Australia's public health system. Some reported difficulties in being admitted within the public health system due to a variety of reasons including strict eligibility criteria, presentations of ED not fitting the definitions outlined in Section 1.1,

and additional barriers to accessing treatment. In some circumstances, individuals may not be appropriately diagnosed as having an ED due to misperceptions of what someone with an ED may look like (i.e. 'thin white wealthy women').<sup>94</sup> One individual noted that this excluded them from receiving specialised care and treatment which exacerbated their ED and co-occurring conditions.

However, receiving private health care involves higher out-of-pocket costs and may not be accessible through insurance or bursary programs. It was noted that the high costs of accessing private health care placed additional stress on individuals with lived experience during recovery. Studies suggest that late intervention for EDs increases the persistence of the ED and decreases the likelihood of remission.<sup>95</sup> This was supported by the lived experience consultation group where it was highlighted that late intervention was more costly for the health system in the long run.

The lived experience survey highlighted that individuals with an ED often experience co-occurring conditions arising from the impacts of having an ED (see box on *Co-occurring conditions and their impact on ED development*). Additional care and medical attention such as medical scans, medications and regular blood tests are often required for secondary physical and mental health conditions. This further increases their health system costs beyond what is captured by the health cost estimates.

### Co-occurring conditions and their impact on ED development

People with lived experience of an ED are likely to have co-occurring conditions which can increase health system costs. A range of mental illnesses, such as obsessive-compulsive disorder, bipolar disorder, anxiety and mood disorders, post-traumatic stress disorder, and substance abuse, frequently co-exist with EDs.<sup>96, 97, 98, 99</sup>

<sup>100, 101</sup> Research suggests that 55-97% of those with an ED also receive diagnoses with at least one other psychiatric disorder.<sup>102</sup> The additional costs related to these co-occurring conditions may not be captured within the data used for this report, however they can be highlighted through the experiences of people with EDs.

Several participants in the lived experience survey and consultation group highlighted that co-occurring physical and mental health conditions increased their risk of developing an ED. Some participants recounted the necessity of seeing multiple practitioners because not all services were comprehensive or capable of addressing co-occurring needs alongside ED treatment.

Lived experience representatives also mentioned that living with an ED over time can result in the development of other physical and psychological health conditions, which increased the need for participants to seek and receive ongoing specialised care and rehabilitation. Conditions included chronic health conditions, cardiac problems (i.e., arrhythmias, postural tachycardia), bone and joint problems, autoimmune disorders, gastrointestinal problems, metabolic problems, thyroid problems, and stress and trauma from the experiences of living with and going through treatment for an ED. These co-occurring conditions increased the severity of ED symptoms and affected treatment outcomes.<sup>103</sup>

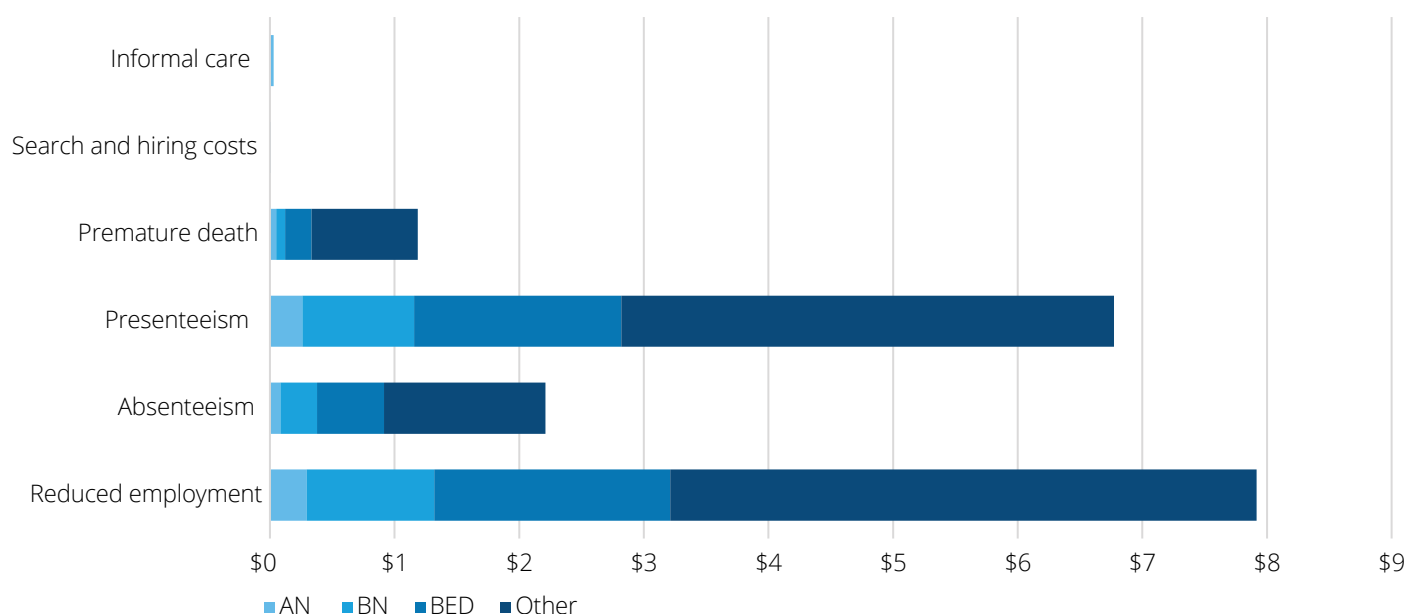
Co-occurring conditions and the associated medical costs place an additional financial burden on individuals with EDs. The intersections of treatment and medication for multiple conditions adds further complexity. Those consulted indicated difficulties and additional costs associated with finding and accessing specialised ED treatment that appropriately considers their co-occurring conditions and applies a holistic and integrated approach to care.

## 4.2 Productivity losses

EDs can have a negative impact on an individual's participation in employment and disrupt their engagement and productivity, amounting to costs of \$18.1 billion in 2023.

Productivity losses for people with an ED were estimated to be \$18.1 billion, equating to a cost per person of \$16,424 (see Chart 4.4). Of the productivity losses, reduced employment accounted for \$7.9 billion (44%), presenteeism for \$6.8 billion (37%) and absenteeism for \$2.2 billion (12%). Lost earnings from premature death cost \$1.2 billion (7%) and hiring replacement workers cost less than \$1 million (less than 1%). Informal care was estimated to be \$29.2 million (less than 1%).

The magnitude of these costs is large, reflecting the significant impact EDs have on the productivity of workers who experience them and that 65% of people with an ED are of working age (i.e., aged 15-64).

**Chart 4.4: Productivity costs due to EDs by cost component in 2023 (billions)**


Source: Deloitte Access Economics

**Table 4.4: Productivity costs of EDs in 2023, by productivity cost type**

	AN (\$millions)	BN (\$millions)	BED (\$millions)	Other (\$millions)	All (\$millions)	Cost per person (\$)	Percent of total (%)
Reduced employment	294.0	1,023.2	1,894.3	4,705.6	7,917.1	7,178	44
Absenteeism	83.5	295.0	537.6	1,293.5	2,209.5	2,003	12
Presenteeism	260.1	895.9	1,663.9	3,952.0	6,771.9	6,140	37
Premature death	50.3	72.2	210.3	853.7	1,186.5	1,076	7
Search and hiring costs	0.0	0.1	0.3	0.6	1.0	1	0
Informal care	26.4	2.7	n/a	n/a	29.2	26	0
<b>Total</b>	<b>714.3</b>	<b>2,289.1</b>	<b>4,306.3</b>	<b>10,805.5</b>	<b>18,115.2</b>	<b>16,424</b>	<b>100</b>

Source: Deloitte Access Economics



At a high-level, the productivity cost estimates are consistent with Butterfly's survey of people with lived experience of an ED. 79% of survey respondents had lost income or had incurred employment-related costs due to being forced to stop work, be absent from work, or reduce working hours due to living with an ED or caring for someone with an ED. Further insights on the presentation of productivity costs from those with lived experience of an ED are provided in the box below.

### Productivity costs

Difficulties in maintaining steady and consistent employment as a result of the physical and emotional impacts of their EDs, and lower productivity due to medical episodes is common amongst those with lived experience. As a result, those with EDs are often pushed into casual and insecure work. They are also often required to take time off to manage their ED and use up their sick leave, further reducing their productivity and long-term earnings. In some circumstances, having an ED can impact one's performance at work. One individual stated that they had difficulties remembering key tasks due to the brain fog from their ED. Others highlighted that they commonly had instances where they would collapse at work due to their ED. It was noted that employers were not always understanding or empathetic to these circumstances. Critically, there were scarce or no opportunities for workplace accommodations, workplaces or disability supports that recognised EDs as a chronic and disabling condition – thereby creating a system of inequity and cycles of insecure, underemployment and disrupted work.

This report only produces an average for productivity costs. As such, the figures do not reflect the extreme costs faced by individuals with severe and enduring EDs and the impact this has on their lives.

work). This reflects a lack of available evidence pertaining to the differences by ED type.

However, the per person productivity cost is highest for AN (\$18,453), followed by BED (\$18,407), BN (\$18,258) and other EDs (\$15,328) (see Table 4.5). This primarily reflects the high mortality rate and informal care needs of people with AN.

**Table 4.5: Productivity cost of EDs in 2023, by ED type**

	AN	BN	BED	Other	All
Total cost (\$millions)	714.3	2,289.1	4,306.3	10,805.5	18,115.2
Percent of total (%)	4	13	24	60	100
Per person cost (\$)	18,453	18,258	18,407	15,328	16,424

Source: Deloitte Access Economics

Total productivity losses related to other EDs (60%) are significantly larger than those related to BED (24%), BN (13%) and AN (4%) – reflecting that other EDs are the most prevalent ED among Australia's working aged population. The per person productivity costs appear similar across ED types (e.g., AN costs \$18,453 per person and BN costs \$18,407). However, care should be taken when engaging in this comparison, as several inputs were the same across ED type (e.g., days absent from

### 4.3 Efficiency losses

In 2023, efficiency losses associated with EDs cost \$1.9 billion, equivalent to \$1,708 per person with an ED.

Efficiency losses associated with EDs were estimated to equal \$1.9 billion, equating to a cost per person of \$1,708 (see Table 4.6). Company taxes made up most of this cost (\$1.3 billion, 69%), followed by consumer taxes (\$0.5 billion, 28%), reflecting the significant impact EDs have on employment status and productivity.

Efficiency losses related to other EDs (57%) are significantly larger than those related to BED (23%), BN (13%) and AN (7%) – reflecting that other EDs are the most prevalent ED among Australia's working aged population. However, the per person efficiency loss is highest for AN (\$3,266), followed by BN (\$1,923), BED (\$1,876) and other EDs (\$1,529). This primarily reflects the lost taxation and employment revenue associated with AN due to its high mortality rate and informal care needs

**Table 4.6: Efficiency losses associated with EDs in 2023, by cost type**

	<b>AN (\$millions)</b>	<b>BN (\$millions)</b>	<b>BED (\$millions)</b>	<b>Other (\$millions)</b>	<b>All (\$millions)</b>	<b>Cost per person (\$)</b>	<b>Percent of total (%)</b>
Consumer taxes	19.8	63.2	121.3	319.3	<b>523.6</b>	475	28
Company taxes	53.1	171.1	315.5	751.7	<b>1,291.4</b>	1,171	69
Government health expenditure	39.5	4.3	2.2	6.8	<b>52.8</b>	48	3
Other government expenditure	13.9	2.5	-	-	<b>16.5</b>	15	1
<b>Total</b>	<b>126.4</b>	<b>241.1</b>	<b>439.0</b>	<b>1,077.8</b>	<b>1,884.3</b>	<b>1,708</b>	<b>100</b>

Source: Deloitte Access Economics

**Table 4.7: Efficiency losses associated with EDs in 2023, by ED type**

	<b>AN</b>	<b>BN</b>	<b>BED</b>	<b>Other</b>	<b>All</b>
Total cost (\$millions)	126.4	241.1	439.0	1,077.8	1,884.3
Percent of total (%)	7	13	23	57	100
Per person cost (\$)	3,266	1,923	1,876	1,529	1,708

Source: Deloitte Access Economics

#### 4.4 Other financial costs

There are a range of other financial costs attributable to EDs in Australia, accounting for \$534 million.

Other financial costs for people with an ED were estimated to equal \$534.0 million, equating to a cost per person of \$484 (see Table 4.8). Additional grocery costs made up most of this cost (\$443.6 million, 83%), followed by travel and accommodation costs (\$90.4 million, 17%).

Additional grocery costs are experienced by individuals with BN and those with BED. Binge eating episodes involve experiencing an uncontrollable urge to consume a large amount of food in a short period of time. The purchasing of these large food volumes is costly – approximately, \$1,235 per person with BN or BED (or \$402 per person with an ED).

Travel and accommodation costs are incurred by people in regional and remote areas who need to travel to receive treatment. They were estimated to be \$975 per person from regional and remote areas who receives ED treatment (or \$82 per person with an ED).

**Table 4.8: Other financial costs of EDs in 2023, by cost type**

	<b>AN (\$millions)</b>	<b>BN (\$millions)</b>	<b>BED (\$millions)</b>	<b>Other (\$millions)</b>	<b>All (\$millions)</b>	<b>Cost per person (\$)</b>	<b>Percent of total (%)</b>
Grocery	-	220.6	223.1	-	<b>443.6</b>	402	83
Travel and accommodation	3.2	10.3	19.2	57.8	<b>90.4</b>	82	17
<b>Total</b>	<b>3.2</b>	<b>230.8</b>	<b>242.2</b>	<b>57.8</b>	<b>534.0</b>	<b>484</b>	<b>100</b>

Source: Deloitte Access Economics

The financial costs outlined above are averages and do not represent the individual experiences of those with an ED that may differ due to factors such as ED severity, treatment approach, and insurance coverage. The box below provides additional insights into the other potential financial costs faced by those with an ED.

#### Other financial costs

Individuals with EDs reported their main out-of-pocket costs to be travel costs to and from appointments. These included costs related to public transport and petrol costs for driving. These costs were particularly high for individuals who lived rurally or had to travel interstate to receive specific treatment which impacted the receipt of appropriate care and support. One individual noted that their travel costs equated to approximately \$1,200

per year, which was roughly 20% of their income. Another highlighted that they often had to fly to Brisbane and Sydney at their own cost to receive treatment.

Moreover, individuals often spent a high amount on ED behaviours by purchasing certain binge foods or diet plans, buying different clothing sizes to cover their body, and buying weight loss medications such as laxatives. Other financial costs include non-medical costs related to ED treatment, recovery, and post-recovery such as safe foods, supplements, and education on EDs.

The \$534 million generated in other financial costs are largely associated with BED (\$242.2 million, 45%) and BN (\$230.8 million, 43%), reflecting the sizeable cost of increased groceries. The per person cost of BN (\$1,841) is significantly higher than BED (\$1,035). Per person cost for BED was taken from Deloitte’s 2012 survey, inflated to 2023 food prices. It is likely a conservative estimate, with the true cost more closely aligned to BN.

**Table 4.9: Other financial cost of EDs in 2023, by ED type**

	AN	BN	BED	Other	All
Total cost (\$millions)	3.2	230.8	242.2	57.8	534.0
Percent of total (%)	1	43	45	11	100
Per person cost (\$)	82	1,841	1,035	82	484

Source: Deloitte Access Economics

The high out-of-pocket costs related to having an ED and receiving treatment alongside the losses in productivity can exacerbate ED symptoms and result in longer-term health issues, increasing overall costs. This is explored further in the box.

**Interconnected nature between the inability to earn money, increasing health costs, and worsening ED symptoms**

A key theme from the survey and consultation with the lived experience group was the cyclical relationship between the costs associated with having an ED and with treating an ED. The consultation participants spoke to the fact that economic barriers and the inability to access financial support further exacerbated their ED symptoms. Some had to delay treatment while others were unable to adhere to their treatment plans because they could not afford the groceries and safe foods necessary. However, having an untreated ED inadvertently increases ED symptoms and longer-term co-occurring health issues. This reduces productivity and employment, further limiting sufferers’ ability to receive treatment.

The interconnected nature between the inability to earn money, increasing health costs, and worsening ED symptoms emphasises the need for ED prevention and early intervention as well as greater social and economic support to ensure early treatment can be accessed. Economically supported access to services at the very early stages of developing body image concerns and/or an ED is therefore expected to reduce the accrument of costs over time.





# 5 Non-financial costs

Beyond the financial impact, EDs also create a substantial loss in wellbeing. In 2023, this non-financial cost was estimated to be \$46.1 billion.

EDs cause substantive loss of wellbeing due to the reduction in quality of life and increased premature death. This loss in wellbeing is not a financial or monetary cost, but can be valued using a burden of disease approach.<sup>104</sup>

The total YLDs attributable to EDs was estimated to be 136,685 in Australia in 2023. This was equivalent

to \$37.9 billion in lost wellbeing (82% of total loss in wellbeing). The total YLLs attributable to EDs was estimated to be 29,794, which was valued at \$8.3 billion (18%). Together, the loss in wellbeing due to YLDs and YLLs was estimated to be \$46.1 billion (see Table 4.1).

Of all ED types, the per person wellbeing cost was highest for people with AN (\$71,392) – reflecting that AN had the highest disability rate and mortality rate of any ED examined. However, other EDs make up most of the loss in wellbeing cost (\$30.5 billion, 66% of total loss in wellbeing) due to this being the most prevalent ED category.

**Table 5.1: Cost of loss in wellbeing due to eating disorders in 2023, by ED type**

	AN	BN	BED	Other	All
YLDs (#)	8,671	27,959	10,528	89,528	<b>136,685</b>
Cost of YLDs (\$ millions)	2,401.9	7,744.5	2,916.2	24,799.2	<b>37,861.8</b>
YLLs (#)	1,306	1,781	5,970	20,738	<b>29,794</b>
Cost of YLLs (\$ millions)	361.7	493.2	1,653.8	5,744.3	<b>8,253.0</b>
<b>Loss in wellbeing (\$ millions)</b>	<b>2,763.6</b>	<b>8,237.7</b>	<b>4,569.9</b>	<b>30,543.6</b>	<b>46,114.8</b>
% of total (%)	6%	18%	10%	66%	100%
Cost per person (\$)	71,392	65,705	19,534	43,328	41,809

Source: Deloitte Access Economics

The figures above broadly capture the loss of wellbeing for those with an ED by applying as estimated burden of disease. However, to understand the non-financial burden of EDs, the lived experiences of those with an ED must be considered. Conversations with those with lived experience of an ED highlight the following key reasons for losses in wellbeing:

- financial stress,
- loss of financial independence causing shame or discomfort from having to rely on others to fund treatment,
- trauma from negative treatment experiences,
- limitations in ability to increase overall socioeconomic status (study and career), and
- being unable to participate in certain hobbies and activities.

Insights shared by those with lived experience of an ED on these wellbeing factors are discussed further in the box below.

### Non-financial costs

Non-financial costs refer to the intangible losses in wellbeing incurred due to an illness. It encompasses factors such as pain, suffering, reduced quality of life, and the impact on daily activities, which do not have a direct monetary value but significantly affect an individual's wellbeing.

Non-financial costs experienced by people living with an eating disorder can affect individuals' ability to participate in everyday activities, creating barriers to being able to live a 'normal' life or reach their full potential. For people living with an eating disorder this could include educational and career pursuits, leisure and sporting activities and personal/ family relationships, including affecting some people's ability to have children.

A common theme in lived experience engagement was the impact of having an ED on an individual's financial independence due to the high health care costs alongside productivity losses. Where this occurs it is common for family members, friends and other supporters to step in to ensure that they have the financial means to access

care. Those with lived experience of an ED shared that a lack of financial independence could sometimes lead to feelings of shame or discomfort.

The financial strain of accessing care can have a negative impact on the wellbeing of those with an ED, and at times exacerbate ED behaviours. Individuals have withdrawn from treatment to manage financial stress and to reduce the impact on their loved ones and carers. However, withdrawing early from treatment often led to relapse and prolonged health costs. Some individuals stated that they increased their workload as a strategy to afford treatment, but this consequently added stress and worsened their mental health.

One individual reported medical trauma from involuntary restraint and unnecessary admission in public health settings under their state's Mental Health Act. The individual said this prevented them from accessing appropriate and required care in the public health system and compounded their need for treatment for their ED.

Other wellbeing losses identified through the lived experience consultation included the loss of ability to increase overall socioeconomic status. This is often caused by needing to delay studies, or not being able to gain qualifications due to experiencing an ED which narrowed career options and reduced future financial security. Some had lost job opportunities due to their ED, which reduced their ability to increase their socioeconomic status. Others provided examples of missing out on job opportunities due to not being able to drive and being told they were not medically stable enough for certain careers. Those surveyed mentioned that resume gaps were created from having to cease work at times due to the impact of their ED, which were difficult to explain to future employers and created challenges when re-entering the workforce.

The general wellbeing losses associated with not being able to participate in hobbies or activities that would increase wellbeing on an individual level was also commonly highlighted by those with lived experience of an ED. For example, one individual highlighted not being able to fulfil their wish to adopt a rescue dog and have the companionship of a pet due to not having the financial security to look after an animal.





## 6 Conclusion

An estimated 1.1 million Australians aged 5 and over had an ED in 2023, equivalent to 4.45% of the total Australian population aged 5 and over. The results suggest that EDs were most prevalent among women and those 15-19 years old. Those with an ED had a greater risk of mortality than the general population. In 2023, an estimated 1,273 premature deaths across those aged 5 and over occurred due to EDs in Australia.

However, it is noted that the estimated prevalence of EDs included in this report is likely to be underestimated. EDs are significantly underdiagnosed in Australia due to social stigma, the complexity of navigating the healthcare system, and inaccessible supports.<sup>105, 106</sup> Difficulties in accessing a diagnosis and treatment is particularly common among gender diverse individuals, men, neurodivergent people, culturally and racially marginalised groups, and those in regional and remote areas.<sup>107, 108, 109, 110</sup>

Furthermore, EDs have multiple and often shared aetiologies and risk factors which makes diagnosis challenging and complex.<sup>111</sup> Genetics, gastrointestinal microbiota and autoimmune reactions, childhood and early adolescent exposures, personality traits, comorbid mental health conditions, gender identity and expression, socioeconomic status, ethnic background, body image and social influence, and participation in elite sports can all play a role in the development and treatment of EDs.<sup>112</sup>

This report estimates the total social and economic cost of EDs in Australia to be \$66.9 billion, equivalent to \$60,654 per person with an ED. The total financial cost of EDs in Australia in 2023 was \$20.8 billion, with an additional \$46.1 billion in lost wellbeing (see Table 6.1). Most of the financial cost was in the form of lost productivity (\$18.1 billion, 87% of financial cost), followed by efficiency losses (\$1.9 billion, 9%), other financial costs (\$0.5 billion, 3%) and health system costs (\$0.3 billion, 1%).

**Table 6.1: Total cost of EDs in Australia in 2023**

Cost	AN	BN	BED	Other	All
Health system (\$millions)	188.1	20.5	10.6	32.3	<b>251.4</b>
Productivity (\$millions)	714.3	2,289.1	4,306.3	10,805.5	<b>18,115.2</b>
Efficiency losses (\$millions)	126.4	241.1	439.0	1,077.8	<b>1,884.3</b>
Other (\$millions)	n/a	230.8	242.2	n/a	<b>534.0</b>
Loss in wellbeing (\$millions)	2,763.6	8,237.7	4,569.9	30,543.6	<b>46,114.8</b>
<b>Total (\$millions)</b>	<b>3,795.6</b>	<b>11,019.2</b>	<b>9,568.0</b>	<b>42,516.9</b>	<b>66,899.7</b>
Cost per person (\$)	98,052	87,890	40,898	60,312	60,654

Source: Deloitte Access Economics



Individuals bore 38% of the total financial costs (\$7.9 billion), followed by employers (\$6.2 billion, 30%) and the Federal Government (\$4.7 billion, 23%). Society at large (\$1.9 billion, 9%), State and Territory Governments (\$70.1 million, less than 1%) and family and friends of people with EDs (\$22.7 million, less than 1%) were also cost bearers. Individuals with EDs shouldered the \$46.1 billion in lost wellbeing. As illustrated by the lived experience consultation conducted for this report, the emotional toll of EDs on people with lived experience and their carers, families and supporters is incalculable but significant.

## 6.1 Changes over time

Deloitte Access Economics was commissioned by Butterfly Foundation in 2012 to estimate the economic and social impact of eating disorders in Australia. By accounting for inflation and methodological changes between the 2012 and 2023 reports, it is possible to examine ED trends over time.

### 6.1.1 Prevalence

The estimated prevalence of eating disorders in 2023 has increased by 0.41 percentage points from 4.04% in 2012 to 4.45% in 2023.<sup>113</sup> This represents a 21% increase in the number of Australians with an ED, from 913,986 in 2012 to 1,170,270 in 2023. The increase has been driven by the following factors:

- increases in the prevalence of AN (0.12% to 0.16%) and BN (0.48% to 0.51%),
- the inclusion of ARFID as an ED, and
- a large increase in OSFED and UFED, previously categorised more broadly as ENDOS (from 1.52% for ENDOS to 2.72% for OSFED and UFED combined).

Change in prevalence rates varied across types of EDs. The prevalence rate of BED decreased from 2012 to 2023 (1.88% to 0.94%), however this can

be explained by a stricter criterion being applied in the Hay et al. (2017) study which caused some individuals who would have previously been categorised into BED to move into the OSFED and UFED categories.

Despite the increase in prevalence, premature mortality as a result of EDs decreased from 1,829 deaths in 2012 to 1,273 in 2023. However, this report uses a more recent study to calculate mortality and applies an updated method based on hazard ratios rather than calculating excess mortality (the difference between the total expected deaths for those with an ED and the number of deaths within that group if they did not have an ED). This limits the comparability of the results with the 2012 paper. Applying the updated method to 2012 prevalence figures suggests that there would have been 1,064 premature deaths. This would suggest a 20% increase in total premature mortality for those with an ED in Australia between 2012 and 2023, roughly in-line with the increase in prevalence.

### 6.1.2 Costs

Accounting for inflation and the methodological changes summarised in the box below, the total economic cost of EDs was \$49.2 billion in 2012 and \$66.9 billion in 2023.<sup>114</sup> This represents a 36% increase in total costs in real terms since 2012. The cost per person with an ED increased by 13% in real terms in the same period.

Most of this 13% real increase in cost per person with an ED can be explained by changes to wellbeing estimates – namely, the updated mortality methodology, which produced a lower number of deaths, and the use of lower and more accurate disability weights.<sup>114</sup> Of all financial cost components, healthcare costs have had the largest percentage increase (69% in real terms) since the 2012 report.

As shown in the box below, there are a range of methodological differences between the 2012 and

<sup>113</sup> The total cost estimated in the 2012 report is not directly comparable to 2023 estimate due to inflation and methodological changes. As such, Deloitte Access Economics has created a 'like-for-like' cost estimate for 2012 (i.e., adjusting for inflation and methodological changes).

2023 reports. This reflects that, where possible, Deloitte Access Economics has updated aspects of the methodology to align with current best practice and recent findings. For example, the use of disability weights that are specific to each type of ED in the 2023 report aligns to recent evidence that suggests there is significant variation in the wellbeing impacts associated with different ED types (i.e., on average, AN is associated with a more significant reduction in wellbeing than BED).

### Updated methodology

Based on current best practice and availability of data, there were key changes to the methodology compared to the 2012 Deloitte Access Economics report *Paying the Price*. These include:

- 01. Updated mortality:** The 2012 report calculated excess mortality by comparing the mortality rate for those with an ED to the mortality rate of the general population. The method was highly sensitive to age causing deaths amongst younger cohorts to be overestimated and deaths among older cohorts to be underestimated. The updated method for calculating premature ED mortality uses a hazard ratio which isolates the additional risk of death for those with an ED and can be consistently applied across all ages, providing a complete and more accurate estimate.
- 02. Updated disability weights:** In the 2012 report, a disability weight of 0.28 for AN and BN was applied to all EDs.<sup>115</sup> However, recent studies have found the impact of EDs on individuals wellbeing differs significantly by type of ED. As a result, the 2023 report utilises updated disability weights estimated for each type of ED. These disability weights range from 0.045 to 0.224.<sup>116</sup>
- 03. Removal of funeral costs:** Funeral costs are the bring-forward costs of holding a funeral for individuals who die prematurely due to their ED. In line with current best practice, this cost was not included in the 2023 estimates.

## 6.2 Discussion

Since the first *Paying the Price* report in 2012, there has been a national policy focus on improving the care and treatment of individuals with EDs. The recent National Eating Disorders Strategy 2023-2033 aims to address the discrepancies in ED treatment and care by outlining the minimum standards of care that must be met.<sup>117</sup> It outlines three key priority areas for future ED treatment – early intervention, holistic service delivery and culturally-inclusive and trauma informed supports.

This research found that EDs are prevalent and costly conditions that have significant impacts on individuals with EDs, their families and carers, businesses, and society. The overall cost of EDs in Australia, at \$66.9 billion, is likely to still underestimate the true cost of EDs. In particular, individuals with EDs may incur costs that are not specific to EDs – such as, bariatric surgery, diet foods and diet pills – and as such, have not been included in this report.<sup>118, 119</sup>

The largest financial cost of EDs in Australia is productivity costs, making up 87% of total financial costs. These productivity costs include reduced earnings for people with EDs, limiting the affordability of appropriate treatment. Furthermore, the majority (65%) of those with an ED are in the working-age population (i.e., aged between 15 and 64 years old). Once an individual acquires a diagnosis, insights from Butterfly's lived experience consultation suggests they can face administrative and eligibility hurdles in accessing healthcare services, high out-of-pocket costs, long wait times and a limited number of specialist services.<sup>120</sup> These barriers to care, coupled with the productivity impacts, can prevent people with EDs from receiving necessary supports in a timely manner, causing the severity of their EDs to worsen.<sup>121</sup> Over time, this can increase health costs as an individual's symptoms may become more severe while they wait to access community-based care, forcing them to present to the emergency department.<sup>122</sup>

Moreover, lived experience consultation revealed that current treatment of EDs can be siloed and focused primarily on acute presentations of an individual's eating disorder. For example, those with AN reflect just 6% of those with an ED in Australia, yet this group comprises 75% of the health system costs estimated in this report. Limited access to care for different ED conditions may reduce patient outcomes. Instead, a holistic treatment model that considers an individual's co-occurring conditions and unique risk factors should be adopted to treat EDs.

There is also substantial room to improve data collection relating to EDs. A longitudinal, population-wide study on EDs in Australia would enable researchers and clinicians to better understand, prevent and treat eating disorders in the future. Critically, this should include the following attributes detailed below.

- A focus on priority cohorts (e.g., gender-diverse, neurodivergent, culturally and linguistically diverse, and Aboriginal and Torres Strait Islander communities).
- Measurement of the prevalence of EDs, by condition, in Australia. A longitudinal study would capture these changes over time, which is particularly pertinent given that the prevalence of EDs amongst women aged 15-19 has almost doubled between 2012 and 2023 (from 10% to 18%).

- An understanding of the various costs incurred due to EDs. A particular focus should be on costs not captured by current public datasets, such as private out-of-hospital treatment options and medications not covered for EDs under the PBS. This would provide greater transparency around costs incurred by individuals with EDs.
- Follow-up research to better understand the long-term impacts of having an ED and how these evolve over time.

Better data on EDs could help to minimise the attributable economic and social costs in the future, by arming researchers, clinicians, people with lived experience of an ED and their loved ones with a stronger evidence base to understand EDs, their impacts, and how they can be prevented and treated in the future.

# Appendix A

## Prevalence approach

### A.1. Prevalence

The following two key sources were selected to inform the prevalence estimates:

- Qian et al. (2022) is the most recent meta-analyses study. It incorporates results from 33 individual studies and provides pooled estimates of one-year prevalence for AN, BN and BED.<sup>123</sup> It includes both total prevalence and prevalence by sex for each of the EDs.
- Hay et al. (2017) is a general population study that estimates 3-month prevalence for AN-broad, BN, BED-broad, ARFID, OSFED and UFED.<sup>124</sup> The authors examined data from a representative South Australian community study.

The one-year prevalence estimates from Qian et al. (2022) and three-month estimates from Hay et al. (2017) were averaged for AN, BN and BED. For ARFID and OSFED, only Hay et al. (2017) provides estimates. These estimates were benchmarked using the ratio of the averaged BN estimate and the estimate within the source. This ensures alignment with the averaged estimates and allows prevalence to be consistently compared across ED types. Although Qian et al. (2022) does not provide a one-year prevalence estimate for UFED, it provides a three-month prevalence pooled estimate using two Hay et al. studies. This prevalence estimate is taken for UFED and is not benchmarked as it is already consistent across Qian et al. (2022) and Hay et al. (2017).

To create imputed prevalence estimates split by sex, the prevalence sex splits for AN, BN and BED from Qian et al. (2022) were applied to the Hay et al. (2017) estimates. The average split across AN, BN and BED were applied to the ARFID, OSFED and UFED estimates as Qian et al. (2022) does not provide estimates for these ED types.

Udo and Grilo (2018) is the most recent study on ED prevalence that provides prevalence rates by age groups. This study takes a nationally representative sample of 36,306 U.S adults to estimate prevalence by a range of sociodemographic characteristics. In particular, Udo and Grilo (2018) provides prevalence rates for AN, BN and BED for the following age groups:

- 18-29 yrs,
- 30-44 yrs,
- 45-59 yrs, and
- 60+ yrs.

### A.2. Mortality

Mortality is calculated within this report using hazard ratio estimates from a UK national data study and applying these to current prevalence estimates.

Demmler et al. (2020) used electronic health records from general practitioner and hospital admissions in the UK to analyse mortality amongst those with an ED. A total of 15,558 individuals aged 10-65 diagnosed with an ED between 1990 and 2017 were observed. Crude hazard ratios were provided for AN, BN and 'Other eating disorders' for both males and females separately.

ABS life tables were used to calculate the average expected deaths within those 10 to 65 years old. This was converted into a survival rate to then be able to apply the hazard ratios. Converting the figures back into a probability resulted in the expected mortality probability of those with an ED. The difference between the average expected deaths within the general population and within the ED population resulted in the premature morbidity figures within this report. This was then applied to the prevalence counts to calculate the premature deaths within Australians aged 5 and over with an ED in 2023.

# Appendix B

## Costing methodology

### B.1. Financial costs

#### B.1.1. Health system costs

A summary of the approach used to estimate the health costs associated with EDs (excluding residential care) can be found in Table B.1.

**Table B.1: Calculation method for health costs in 2023**

#	Calculation	Details
1.	Estimating direct health system cost	Estimates for direct health system costs in Australia were taken from AIHW disease expenditure data (see Table B.2; AIHW, 2021). <sup>125</sup> While the most recent publicly available data is from FY 2019-20, Deloitte utilised FY 2018-19 data. During FY 2018-19, healthcare utilisation wasn't distorted by the COVID-19 pandemic. Literature suggests that, during FY 2019-20, lockdowns associated with the COVID-19 pandemic limited access to ED supports and increased the severity and incidence of EDs. <sup>126, 127</sup>
2.	Accounting for unallocated data	AIHW only included 73% of total recurrent health expenditure in its estimates of expenditure by disease, referred to as 'allocated' health expenditure. This 'unallocated' remainder (27%) included capital expenditures, expenditure on community health, public health programs, health administration and health aids and appliances. Thus, the allocated health expenditure on EDs (summarised in Table B.2) was factored up by $(1/0.73)-1$ to obtain total health expenditure per person. This additional expenditure is then allocated to the 'other' expenditure category.
3.	Splitting health costs by type of ED	AIHW disease expenditure was not separated by type of ED (e.g., AN, BN). As such, health costs were allocated to AN, BN and other EDs based on percentage of total hospital days that were attributed to each ED type in FY 2018-19 (see Table B.3). These percentages were taken from AIHW's principal diagnosis data cubes (AIHW, 2023). <sup>128</sup>

**Table B.1 continued: Calculation method for health costs in 2023**

#	Calculation	Details
4.	Accounting for changes in recorded healthcare costs	<p>Since FY 2018-19, the recorded healthcare costs associated with EDs are likely to have risen for two reasons:</p> <ul style="list-style-type: none"> <li>• In early FY 2019-20, a new suite of 64 MBS item numbers became available to support eligible ED patients.<sup>129</sup> This expansion of access to ED supports likely increased the healthcare utilisation attributed to EDs.</li> <li>• There is increasing evidence that healthcare utilisation relating to EDs has increased in the aftermath of the COVID-19 pandemic.<sup>130, 131</sup></li> </ul> <p>To account for this increase in healthcare utilisation since FY 2018-19, hospital costs were scaled up by the increase in ED patient days in hospital between FY 2018-19 and FY 2021-22 (2023 was not available). This data was taken from principal diagnosis data cubes (AIHW, 2023).<sup>132</sup> The number of patient days with a primary diagnosis of an ED increased by 27% between FY 2018-19 and FY 2021-22 (AIHW, 2023).<sup>133</sup></p> <p>Out-of-hospital costs were also scaled up to reflect this increase in ED healthcare utilisation. However, no specific ED-related out-of-hospital data could be located. The number of people receiving Medicare-subsidised mental health-specific services increased by 3% between FY 2018-19 and FY 2021-22 (2023 was not available; AIHW, 2023).<sup>134</sup> The ratio of the growth in patient days for ED hospitalisations to the growth in patient days for MH hospitalisations (27%/7%=4.03) was then applied to the 3% increase in mental health-specific services. As such, the estimated growth in out-of-hospital costs of from FY 2018-19 and FY 2021-22 was 12%.</p>
5.	Adjusting for inflation	As the target year of this report is 2023, the FY 2018-19 health costs were adjusted for inflation. Health prices have risen by 14% since FY 2018-19 (ABS, 2023). <sup>135</sup>

Source: Deloitte Access Economics

**Table B.2: AIHW health costs, FY 2018-19**

Type of health cost	AIHW FY 2018-19 cost categories
Hospital services	<ul style="list-style-type: none"> <li>• Public hospital admitted patient: \$62.9 million</li> <li>• Private hospital services: \$33.3 million</li> <li>• Public hospital emergency department: \$3.0 million</li> <li>• Public hospital outpatient: \$7.8 million</li> </ul>
Out-of-hospital medical expenses	<ul style="list-style-type: none"> <li>• Allied health and other services: \$9.8 million</li> <li>• Specialist services: \$7.9 million</li> <li>• Dental expenditure: \$5.7 million</li> <li>• General practitioner services: \$3.2 million</li> <li>• Pathology: \$1.1 million</li> <li>• Medical imaging: less than \$1 million</li> </ul>

**Table B.2 continued: AIHW health costs, FY 2018-19**

Type of health cost	AIHW FY 2018-19 cost categories
Prescription pharmaceuticals	• Prescription pharmaceuticals: Less than \$1 million
Total	• All areas: \$134.8 million

Source: AIHW (2021)<sup>136</sup>
**Table B.3: Total days in hospital by type of ED, FY 2018-19**

Type of health cost	AIHW FY 2018-19 cost categories
AN	74.7
BN	8.1
Other	17.2

Source: AIHW (2023)<sup>137</sup>

Residential care costs accrued in private healthcare facilities are not included in AIHW disease expenditure estimates. As such, they were estimated separately based on data requested by Butterfly Foundation and received from Wandí Nerida. Of the participants that attended Wandí Nerida in 2023, approximately 80% had AN and the remaining 20% had BN. The calculation conducted to estimate residential care costs is summarised in Table B.4.

**Table B.4: Calculation method and data sources for residential care in 2023**

Calculation	Details
Average cost of program per discharged participant 2023	• <b>Average cost of program per discharged participant 2023:</b> The average cost of treatment per participants was \$82,975 (provided by Wandí Nerida).
X	• <b>Number of participants discharged 2023:</b> 57 participants were discharged from Wandí Nerida in 2023 (provided by Wandí Nerida).
Number of participants discharged 2023	

Source: Deloitte Access Economics



### B.1.2. Productivity costs

The calculations, data sources and assumptions used to estimate the productivity costs associated with EDs are set out below in Table B.5.

**Table B.5: Calculation method and data sources for productivity losses in 2023**

Component	Calculation	Details
Reduced employment	Number of people with EDs X (General population employment rate – people with EDs employment rate) X AWE X 52 weeks	<ul style="list-style-type: none"> <li>• <b>Number of people with EDs:</b> Estimated by Deloitte by averaging across the prevalence rates from Qian et al. (2022), Hay et al. (2017) and Santomauro et al. (2021), and applying the age distributions from Udo and Grilo (2018) and AIHW hospital admissions data (2021-22).<sup>138</sup> 139, 140, 141</li> <li>• <b>General population employment rate:</b> Employment to population ratio, split by age and sex (ABS, 2023).<sup>142</sup></li> <li>• <b>People with EDs employment rate:</b> The lower FTE employment rate of people with an ED was split into two key components. First, people with an ED were more likely to exit the workforce completely due to their ED in 2023. Individuals with an ED were less likely to report any earnings in the past 12 months, compared to individuals without an ED – OR=0.67 (Samnaliev et. al. 2015).<sup>143</sup> Second, people with an ED were more likely to reduce their hours of work due to their ED. People with a mental health condition work 91% of the hours worked by people without a mental health condition (ABS, 2022).<sup>144</sup></li> <li>• <b>AWE:</b> Average weekly earnings of all employees split by age and sex and inflated to 2023 values (ABS, 2021).<sup>145</sup></li> </ul>
Absenteeism	Number of people with EDs X Absenteeism days in a year X Daily wage	<ul style="list-style-type: none"> <li>• <b>Number of people with EDs:</b> Estimated by Deloitte by averaging across the prevalence rates from Qian et al. (2022), Hay et al. (2017) and Santomauro et al. (2021), and applying the age distributions from Udo and Grilo (2018) and AIHW hospital admissions data (2021-22).<sup>146</sup> 147, 148, 149</li> <li>• <b>Absenteeism days:</b> EDs cause, on average, 10 additional days off work per year (Deloitte survey).<sup>150</sup></li> <li>• <b>Daily wage:</b> Average weekly earnings of all employees split by age and sex, divided by 5 days and inflated to 2023 figures (ABS, 2021).<sup>151</sup> This assumes a work week of 5 days.</li> </ul>
Presenteeism	Number of people with EDs X Productivity impact X AWE X 46 weeks (52 weeks – 4 weeks annual leave – 2 weeks sick leave)	<ul style="list-style-type: none"> <li>• <b>Number of people with EDs:</b> Estimated by Deloitte by averaging across the prevalence rates from Qian et al. (2022), Hay et al. (2017) and Santomauro et al. (2021), and applying the age distributions from Udo and Grilo (2018) and AIHW hospital admissions data (2021-22).<sup>152</sup> 153 154 155</li> <li>• <b>Productivity impact:</b> EDs cause, on average, a 20.4% reduction in productivity (Deloitte survey).<sup>156</sup></li> <li>• <b>AWE:</b> Average weekly earnings of all employees split by age and sex and inflated to 2023 values (ABS, 2021).<sup>157</sup></li> </ul>

**Table B.5 continued: Calculation method and data sources for productivity losses in 2023**

Component	Calculation	Details
Premature mortality	Number of deaths X Expected lifetime earnings	<ul style="list-style-type: none"> <li>• <b>Number of deaths:</b> Estimated by Deloitte by using the hazard ratios from Demmler et al. (2020) and comparing this with the expected death rate within the general population from the ABS life tables.<sup>158, 159</sup></li> <li>• <b>Expected lifetime earnings:</b> Estimated by multiplying years left in working age population (i.e., 15-64) by the average employment rate for people with EDs and wage in each year, split by age and sex (ABS, 2023; ABS, 2021).<sup>160, 161</sup></li> </ul>
Search and hiring	Number of deaths X People with EDs employment rate X [AWE X Average replacement and training time - (AWE X Average replacement and training time / (1 + discount rate) ^ Average tenure]]	<ul style="list-style-type: none"> <li>• <b>Number of deaths:</b> Estimated by Deloitte by using the hazard ratios from Demmler et al. (2020) and comparing this with the expected death rate within the general population from the ABS life tables.<sup>162, 163</sup></li> <li>• <b>People with EDs employment rate:</b> Individuals with an ED were less likely to report any earnings in the past 12 months, compared to individuals without an ED – OR=0.67 (Samnaliev et. al. 2015).<sup>164</sup></li> <li>• <b>AWE:</b> Average weekly earnings of all employees split by age and sex and inflated to 2023 values (ABS, 2021).<sup>165</sup></li> <li>• <b>Average replacement and training time:</b> The average time it takes to replace and retain a new employee is 26 weeks (Deloitte Access Economics, 2015).<sup>166</sup></li> <li>• <b>Discount rate:</b> The discount rate applied was 1.55%.</li> <li>• <b>Average tenure:</b> The average tenure of an Australian employee is 3 years (Deloitte Access Economics, 2015).<sup>167</sup></li> </ul>
Informal care	Number of people receiving informal care X Hours of informal care per week X Replacement cost of an hour of informal care	<ul style="list-style-type: none"> <li>• <b>Number of people receiving informal care:</b> There were 1,150 people who received Commonwealth payments to care for someone with AN or BN (DSS, 2023).<sup>168</sup></li> <li>• <b>Hours of informal care per week:</b> The average caregiver of someone with an ED provides 12.4 hours of care per week (Deloitte survey).</li> <li>• <b>Replacement cost of an hour of informal care:</b> The average hourly cost of employing a formal carer to replace an informal carer, with all relevant loadings, was estimated to be \$36.12 (Deloitte Access Economics, 2020).<sup>169</sup></li> </ul>

Source: Deloitte Access Economics

### B.1.3. Efficiency losses

The methodological approach to estimating the efficiency losses associated with EDs in 2023 is summarised in Table B.6.

**Table B.6: Calculation method and data sources for efficiency losses in 2023**

Component	Calculation	Details
Consumer taxes	(Reduced employment costs + Absenteeism costs borne by employees) X Average personal income tax rate X Efficiency loss of income tax	<ul style="list-style-type: none"> <li>• <b>Reduced employment costs:</b> Estimated by Deloitte.</li> <li>• <b>Absenteeism costs borne by employees:</b> Estimated by Deloitte.</li> <li>• <b>Average personal income tax rate:</b> 22.3% (ATO, 2013-14)<sup>170</sup></li> <li>• <b>Efficiency loss of income tax:</b> 25.0% (Cao et al. 2015)<sup>171</sup></li> </ul>
Company taxes	(Absenteeism costs borne by employers + Presenteeism costs + Informal care costs) X Company tax rate X Efficiency loss of company tax	<ul style="list-style-type: none"> <li>• <b>Absenteeism costs borne by employers:</b> Estimated by Deloitte.</li> <li>• <b>Presenteeism costs:</b> Estimated by Deloitte.</li> <li>• <b>Informal care costs:</b> Estimated by Deloitte.</li> <li>• <b>Company tax rate:</b> 29.2% (ATO, 2013-14)<sup>172</sup></li> <li>• <b>Efficiency loss of company tax:</b> 50.7% (Cao et al. 2015)<sup>173</sup></li> </ul>
Government health expenditure	Health system costs X Proportion of health systems costs paid by the government X Efficiency loss of welfare payments	<ul style="list-style-type: none"> <li>• <b>Health system costs:</b> Estimated by Deloitte.</li> <li>• <b>Proportion of health systems costs paid by the government:</b> 41.6% for Federal Government and 26.7% for State Government (AIHW, 2016)<sup>174</sup></li> <li>• <b>Efficiency loss of welfare payments:</b> 42.6% (Cao et al. 2015)<sup>175</sup></li> </ul>
Other government programs	Government programs expenditure X Efficiency loss of welfare payments	<ul style="list-style-type: none"> <li>• <b>Government programs expenditure:</b> Data from Department of Social Services 2022.</li> <li>• <b>Efficiency loss of welfare payments:</b> 42.6% (Cao et al. 2015)<sup>176</sup></li> </ul>

Source: Deloitte Access Economics

### B.1.4. Other financial costs

The methodological approach to estimating the additional grocery costs faced by those with BED and BN, as well as the travel and accommodation costs for regional and rural Australians with an ED, are summarised in Table B.7.

**Table B.7: Key inputs for estimating other financial costs**

Component	Calculation	Details
Grocery costs	Number of people with that ED X Increase in grocery bill due to ED	<ul style="list-style-type: none"> <li>• <b>Number of people with that ED (BED and BN):</b> Estimated by Deloitte based on Qian et al. (2022), Hay et al. (2017) and Santomauro et al. (2021).<sup>177, 178, 179</sup></li> <li>• <b>Increase in grocery bill due to ED (BED):</b> The median binge eating respondent estimated that their ED increased their household grocery bill by \$750 a year (Deloitte survey). This was inflated to a 2023 figure.</li> <li>• <b>Increase in grocery bill due to ED (BN):</b> For people with BN, 32% of all food costs are related to their ED (Crow et al. 2009).<sup>180</sup> Average grocery bill per person is \$134.50 per week (Collins and Whatnall, 2022).<sup>181</sup></li> </ul>
Travel and accommodation costs	Number of people with an ED X Percent who live in rural and regional areas X Percent who receive treatment X Travel and accommodation cost	<ul style="list-style-type: none"> <li>• <b>Number of people with EDs:</b> Estimated by Deloitte by averaging across the prevalence rates from Qian et al. (2022), Hay et al. (2017) and Santomauro et al. (2021), and applying the age distributions from Udo and Grilo (2018) and AIHW hospital admissions data (2021-22).<sup>182, 183, 184, 185</sup></li> <li>• <b>Percent who live in rural and regional areas:</b> 28% of the Australian population live in rural and remote areas (ABS, 2023).<sup>186</sup></li> <li>• <b>Percent who receive treatment:</b> Only 30% of people with an ED receive treatment for their ED (Inside Out, 2021).<sup>187</sup></li> <li>• <b>Travel and accommodation cost:</b> The median estimate for annual spending on travel and accommodation related to EDs was \$750 a year (Deloitte survey). \$750 was inflated to a 2023 figure.</li> </ul>

Source: Deloitte Access Economics

### B.2. Non-financial costs

The loss of wellbeing that occurs due to EDs can be calculated using the following formula:

- $DALYs = [YLDs (\text{Disability weights} \times \text{Prevalence of EDs by age and sex}) + YLLs (\text{Number of deaths due to EDs} \times \text{Discounted standard life expectancy at the average age of death})]$
- $\text{Loss of wellbeing} = DALYs \times VSLY$
- Each of the components for loss of wellbeing is detailed below in Table B.8.

**Table B.8: Key inputs for estimating loss of wellbeing**

Calculation	Details
Disability weights	Disability weights varied by ED (AN, BN, BED and OSFED). These weights were based on Santomauro et al. (2021) and are outlined in detail below in Table B.9. <sup>188</sup>
Prevalence of EDs by age and sex	Estimated by Deloitte by averaging across the prevalence rates from Qian et al. (2022), Hay et al. (2017) and Santomauro et al. (2021), and applying the age distributions from Udo and Grilo (2018) and AIHW hospital admissions data (2021-22). <sup>189, 190, 191, 192</sup>
Number of deaths due to EDs	Estimated by Deloitte by using the hazard ratios from Demmler et al. (2020) and comparing this with the expected death rate within the general population from the ABS life tables. <sup>193, 194</sup>
Discounted standard life expectancy at the average age of death	Estimated by Deloitte by discounting the expected number of years left at each age from the ABS Life Tables (2019-2021). <sup>195</sup>
VSLY	The value of a statistical life in 2022 was \$227,000. <sup>196</sup>

Source: Deloitte Access Economics

**Table B.9: Disability weights for EDs**

Type of eating disorder	Disability weight
AN	0.224
BN	0.223
BED	0.045
OSFED	0.127

Source: Santomauro et al. (2021)<sup>197</sup>

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Deloitte Access Economics Pty Ltd  
ACN 149 633 116  
Quay Quarter Tower  
50 Bridge Street, Sydney NSW 2000  
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