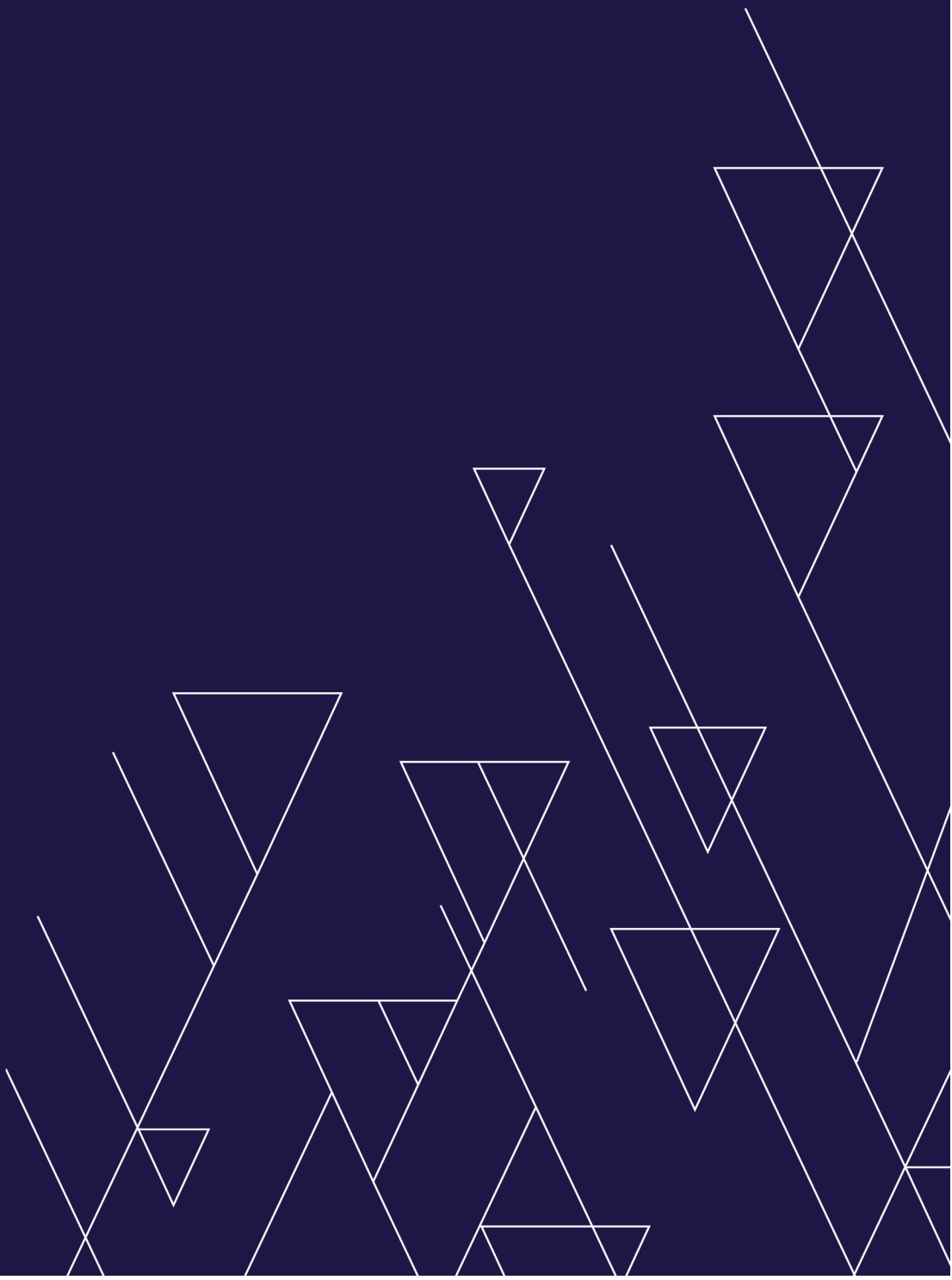
The social costs of gambling to Victoria, 2023

Gaming and Liquor

June 2025



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Funding

This study was funded by the Victorian Responsible Gambling Foundation (VRGF) (project number SR/23/01). From 1 July 2024, the Victorian Government transferred the functions of the Victorian Responsible Gambling Foundation to other parts of government. The research and evaluation functions transferred to the Department of Justice and Community Safety.

Conflict of interest declaration

The authors declare no conflict of interest in relation to this report or project.

To cite this report

Browne M, Tulloch C, Rawat V, Dellosa G, Russell AMT, Hing N, Rockloff M and Doran C (2025) *The social costs of gambling to Victoria, 2023*, State Government of Victoria, Melbourne.

ISBN

978-1-921699-26-9 (pdf/online/MS word)

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The social costs of gambling to Victoria, 2023

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June 2025

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Acknowledgements

The researchers acknowledge the financial support to conduct this research provided by the State Government of Victoria.

How to read this report

The summary provides a high-level overview of the background to the study and the key findings. The report itself is found at Section 2, beginning with the methodology, followed by results and discussion. For a detailed discussion of the context in which this study took place, including a review of previous costing studies, key gambling harm issues and research gaps, please refer to the literature review included at Appendix 5.

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Terminology

This report uses the term 'problem gambler' to refer to people classified as such by the Problem Gambling Severity Index (PGSI). We recognise that the term is stigmatising and outdated and fails to capture the complex range of social, cultural, policy, legislative, economic and environmental factors, as well as the design and marketing of gambling products, that impact gambling behaviour and harm. This report only uses this term in relation to the PGSI.

Abbreviations

Abbreviation	Term
DALY	Disability-adjusted life year
EGMs	Electronic gaming machines
GDP	Gross domestic product
GHM	Gambling Harm Measure
GHS-10	Gambling Harms Scale 10
GHS-20	Gambling Harms Scale 20
GHS-10-AO	Gambling Harms Scale 10 for Affected Others
GRH	Gambling-related harm
HRQoL	Health-related quality of life
PGSI	Problem Gambling Severity Index
PHIGam	Public health impacts of gambling
QALY	Quality adjusted life year
SCCA	Survey of Clients of Counselling Agencies
SEIG	Socio-Economic Impact of Gambling Framework
SGHS	Short Gambling Harm Screen
SOGS	South Oaks Gambling Screen
TTO	Time trade-off
VAS	Visual analogue scale
VCEC	Victorian Competition and Efficiency Commission
VGCCC	Victorian Gambling and Casino Control Commission
VLY	Value of a statistical life year
VoSLY	Value of statistical life years
VPGHS	Victorian Population Gambling and Health Study
VRGF	Victorian Responsible Gambling Foundation
YLD	Years lived with a disability
YLL	Years of life lost

1. Summary

1.1 Introduction

Gambling is a significant contributor to the Victorian economy, generating substantial revenue and tax income. In the 2022–23 financial year, the Victorian gambling industry generated approximately $7.4 billion in revenue from gambling losses. The Victorian Government collected $2.47 billion in taxes and levies from this amount, including $1.35 billion from electronic gaming machines (EGMs) (Department of Treasury and Finance 2023). But gambling also imposes considerable costs on individuals, families and the broader community. It is the aim of a social economic costing to estimate these costs.

In 2017 *The Social cost of gambling to Victoria* report by Browne and colleagues (2017b) estimated the costs associated with problem gambling in 2014–15 to be around $7 billion. The current report provides an updated estimate of the economic and social costs of gambling harm in Victoria for the 2022–23 financial year. It builds on the methodology established in the previous Victorian costing study (Browne et al. 2017b), incorporating new data sources, research findings and methodological improvements to provide a comprehensive assessment of the impacts of gambling harm.

The study adopts a public health approach, examining costs associated with gambling problems across a broad spectrum of severity, from low-risk gambling through to severe problem gambling. It includes the costs of gambling harm associated with all gambling forms to Victoria, including illegal offshore wagering. It also considers the significant impact of gambling harm on affected others such as family members and friends, and encompasses both tangible and intangible costs.

Key areas of focus in this updated analysis include:

- incorporating new knowledge that leverages research conducted since 2017
- using the most recent data sources, including the 2023 Victorian Population Gambling and Health Study (VPGHS)
- summarising the literature that informed the study's approach
- identifying sources of uncertainty and employing parametric bootstrapping[1] to estimate confidence intervals for key estimates
- breaking down the costs by different gambling forms and products
- evaluating the potential impact of policy options to reduce gambling harm
- comparing the improved methodology with the previous approach.

The report aims to provide policymakers and stakeholders with robust, up-to-date evidence on the wide-ranging impacts of gambling harm in Victoria. This information is critical for developing effective public health strategies, regulations and interventions to prevent and reduce gambling harm.

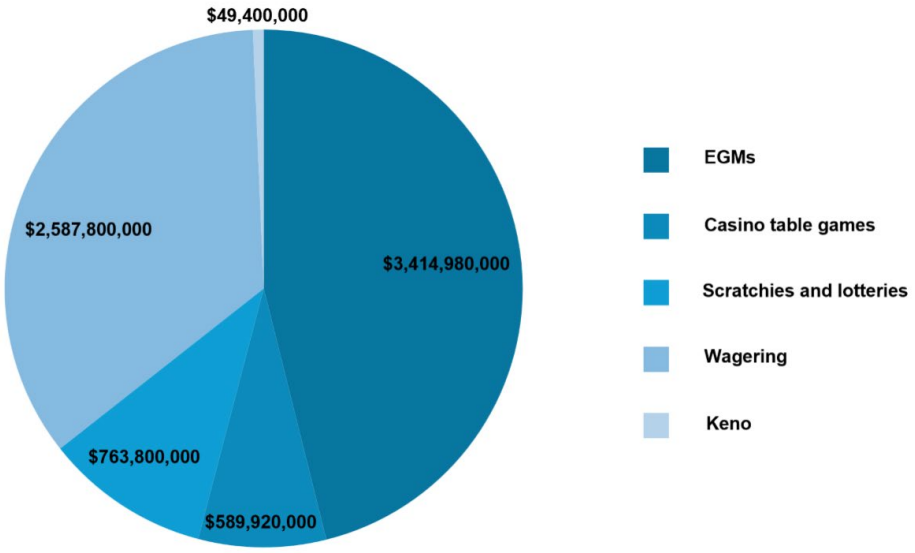
[1] Parametric bootstrapping is a statistical method used to understand how reliable an estimate is, by simulating new data based on an existing model. The use of these techniques provides a more robust understanding of the potential variability in the total cost of gambling in Victoria

1.2 Key findings and highlights

1.2.1 Gambler losses by form and problem gambling status

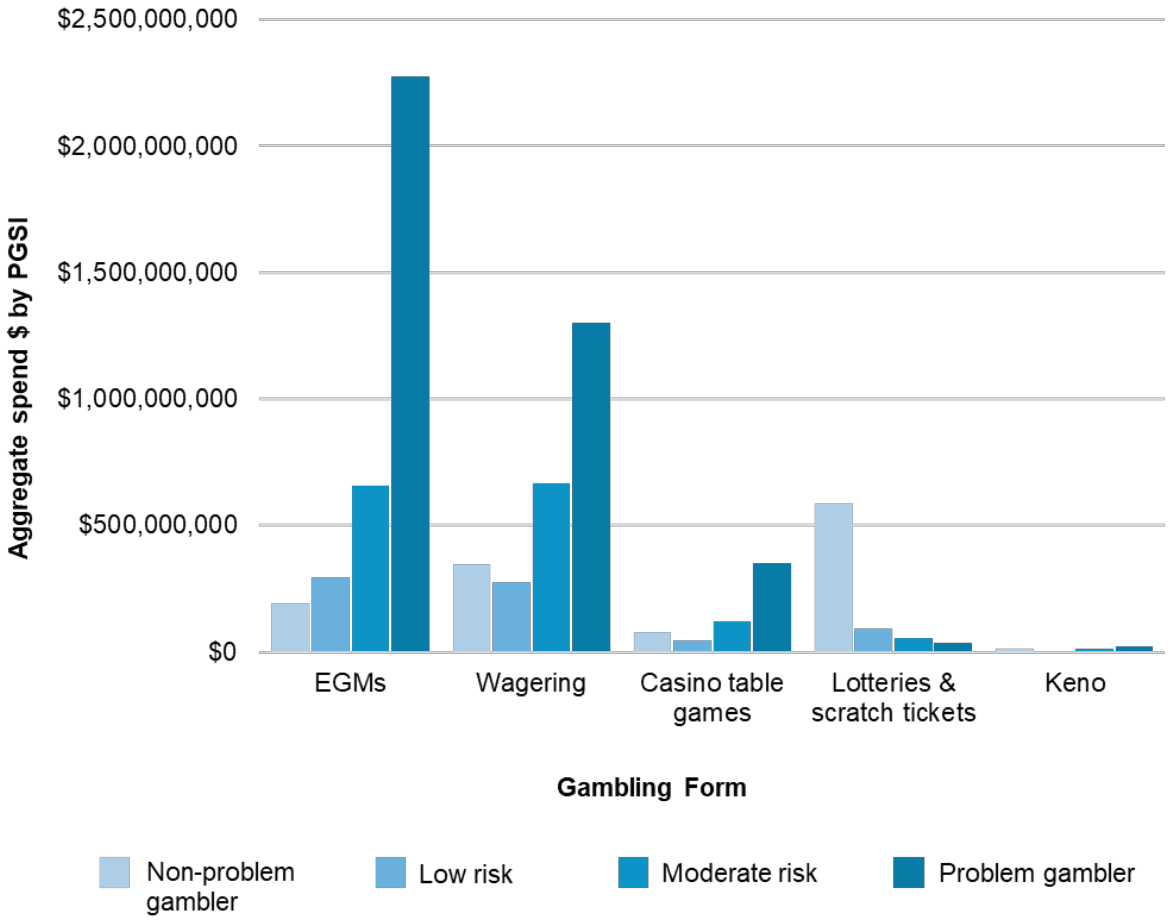
As shown in Figure 1, EGMs, together with wagering products, account for about four-fifths of player losses in Victoria. Scratchies and lotteries account for far less revenue than EGMs, despite almost 4 times as many Victorians gambling on those forms than on EGMs. This is because a typical person who gambles on EGMs spends far more per annum than those who buy scratch or lottery tickets.

Figure 1: Gross revenue/player losses in Victoria by form



As shown in Figure 2, these differences in aggregate player losses across forms are magnified when considering the gambling risk status of people who gamble. Although most people who gamble on EGMs, wagering and casino table games do not experience problems, those who do account for most gambling losses, and by extension, government and industry revenue. The pattern is reversed for lotteries and instant scratch tickets, where most revenue is derived from non-problem gamblers. The excessive losses by at-risk gamblers comprise a significant component of the total cost of gambling in Victoria.

Figure 2: Total losses on each form by gambling risk category



Note: Refer to Appendix 1 for complete data.

1.2.2 Gambling harms and quality of life

Excessive gambling drives other negative consequences for the people who gamble and those close to them. The immediate consequences involve financial harms such as being unable to afford to pay for bills or to buy necessary items including medications. Secondary consequences include psychological and emotional distress and impacts on relationships and other areas of life.

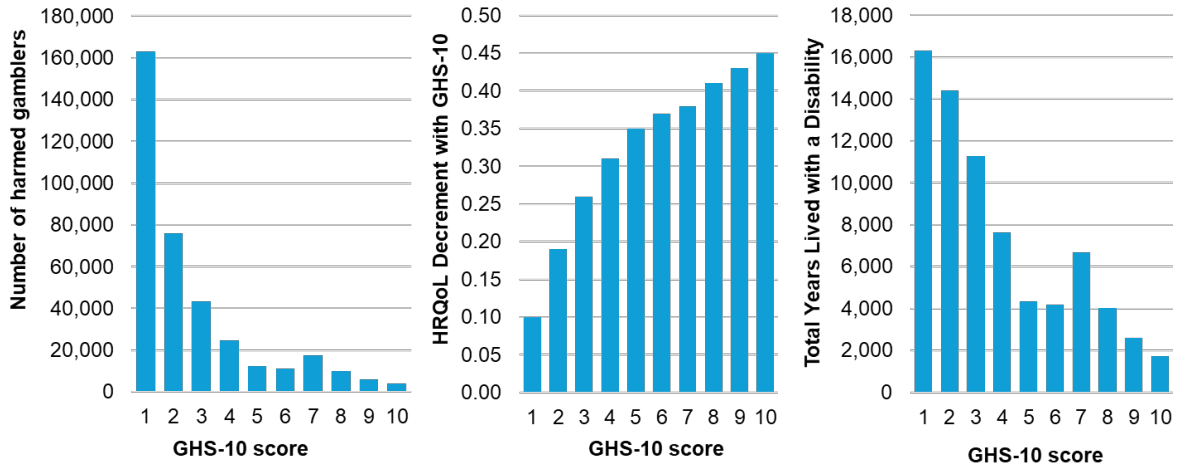
Most of these intangible costs are captured in this report via the global impact to health-related quality of life (HRQoL) measure. HRQoL refers to a person or group's perceived physical and mental health over time, and this is monetised with respect to Australian gross domestic product (GDP) per capita. While economic and revenue benefits of gambling tend to be tangible, costs are largely externalised to individuals and families experiencing unsustainable losses and therefore living beyond their means. So, although HRQoL costs are considered 'intangible' since they are not measured in terms of direct financial transfers, they nevertheless represent a major part of any economic costing of gambling because they appropriately account for these external costs.

Based on the 2023 VPGHS, 367,861 Victorian adults (7.08%) experience one or more harms from their own gambling on the Gambling Harms Screen (GHS-10).

The first and second panels of Figure 3 show the distribution of GHS-10 scores (prevalence) and the HRQoL decrements associated with these scores (severity).

The final panel presents the aggregate years of life lost due to disability (prevalence × severity) across this spectrum of impact. As illustrated, the 73,170 life-years lost due to loss of health and wellbeing is weighted towards the lower end of the spectrum. This supports the 'prevention paradox'; that is, the higher prevalence of those reporting fewer harms outweighs the lesser impact suffered on an individual level. In short, many people experience one, 2 or 3 harms, such as missed bill payments due to gambling, accounting for most of the aggregate costs in the whole population.

Figure 3: Number of Victorians with gambling harms, quality-of-life impacts per person, and aggregate impact across the spectrum



Note: Refer to Appendix 2 for complete data.

1.2.3 A detailed breakdown of the cost

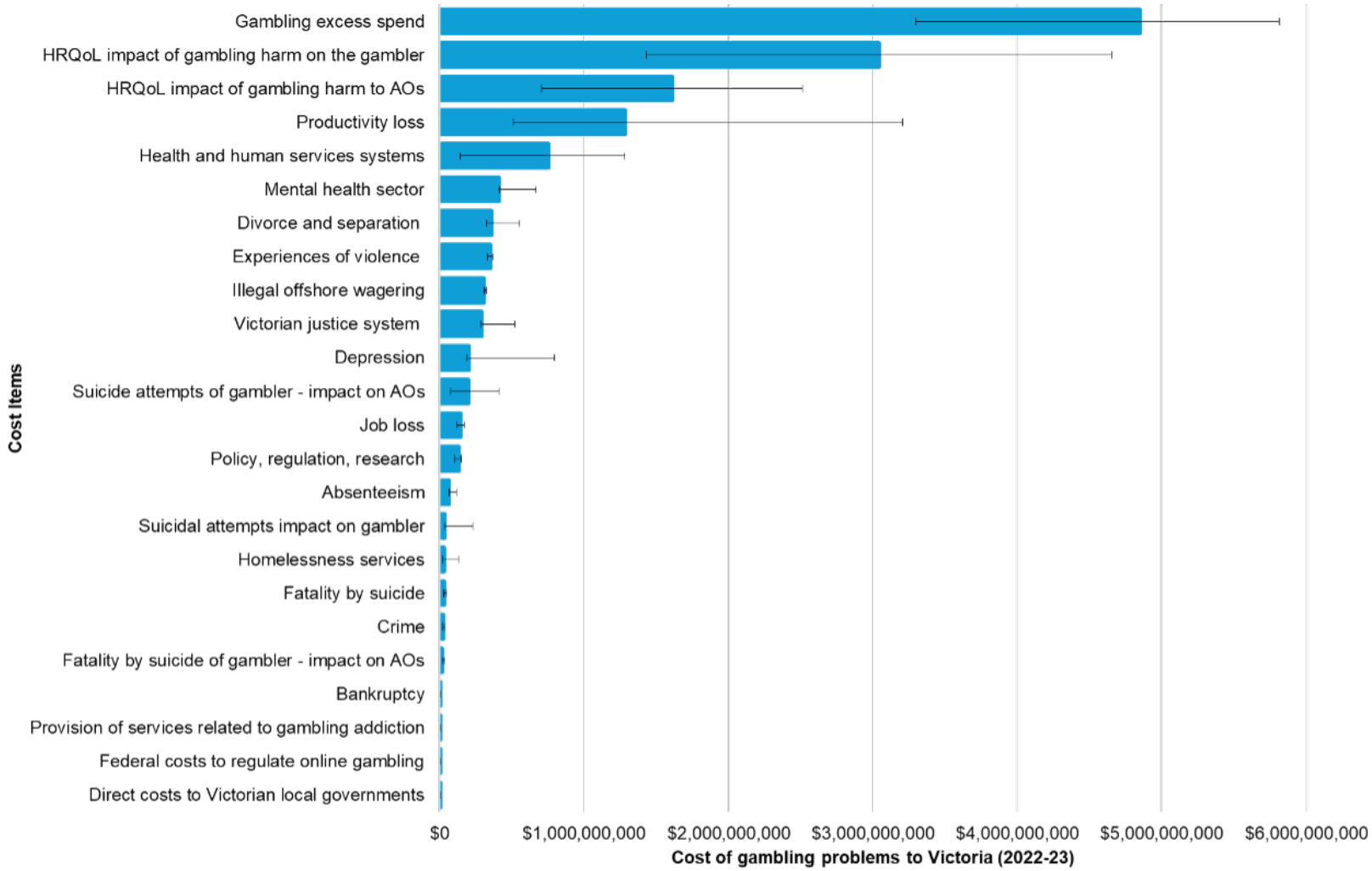
We calculate the total cost of gambling to Victoria in 2022–23 to be $14.1 billion, almost double the total size of industry revenue. This cost includes many specific cost categories, as shown in Figure 4.

Most cost components, and especially intangible components, are affected by multiple sources of uncertainty. As detailed in the full report, we have taken a conservative approach to estimating upper and lower bounds for parameters and have avoided double counting across cost-categories. The uncertainty of each category estimate is indicated by the black error bars in Figure 4. Our bounds for the bottom-line total figure are between $12.7 billion and $17.0 billion.

As illustrated, the costs relate mostly to excess spend by at-risk gamblers, followed by HRQoL impacts to people who gamble and affected others. Each of these cost categories reflects intangible costs that can be monetised in a variety of ways and so are subject to relatively wide confidence intervals. Similarly, our estimates for excessive spend are subject to (bootstrapped) sampling uncertainty with respect to self-reported spend. But our observed discrepancies between at-risk gambling and non-problem gambling components of spend, derived from the 2023 VPGHS, are consistent with that seen previously in Victoria and elsewhere.

Of the tangible cost categories, productivity losses and added burden on the health and human services systems are the largest cost categories. But the impacts are poorly measured and are therefore also subject to a relatively high degree of uncertainty. A range of other specific tangible costs are also measured with a high level of confidence, but these account for a minor proportion of the total costs of gambling.

Figure 4: Detailed breakdown of gambling-related costs in Victoria



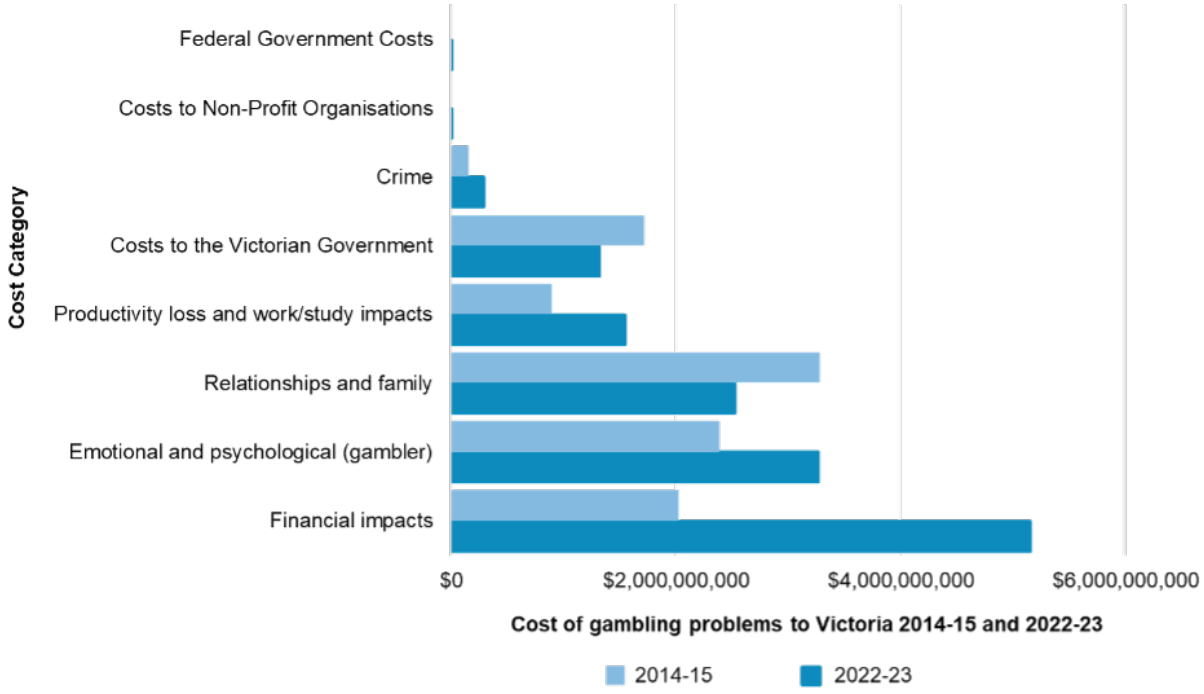
Note: Refer to Appendix 3 for complete data.

1.2.4 Changes in broad cost categories since the last costing

Figure 5 collapses the various cost items into broad categories and compares our result with those of the prior 2014–15 costing in inflation-adjusted dollars. Key reasons for change in each cost category are summarised below. Excluding inflation, these differences are due to:

- methodological adjustments and improvements
- updated data sources
- structural changes in the profile of gambling and associated impacts over time.

Figure 5: Changes in cost-categories since the 2015 costing



Note: Refer to Appendix 4 for complete data.

Aside from inflation, which affected all categories, the main reasons for changes in each category are the following:

- *Federal government and non-government organisation costs*. These were sourced for the current costing but not included previously.
- *Crime.* Sentencing durations were increased based on newer and more detailed information.
- *Costs to the Victorian Government and local governments.* These were reduced due to a more conservative estimate of people who gamble with wellbeing issues and less direct costs to local governments due to fewer EGM application decisions.
- *Productivity loss and work/study impacts.* These increased markedly due to now including impacts to affected others, as well as people who gamble.
- *Relationships and family.* There were reductions due to updated and more conservative data for suicide and divorces linked to gambling. But there were slight increases due to updated estimates for domestic violence and HRQoL impacts to affected others. Population prevalence data on harms to affected others was available in the present costing, but not previously.
- *Emotional and psychological impacts (to the person who gambles).* These increased substantially due to monetisation via GDP per capita ($97,435) in line with current health

economic practice, as compared with prior monetisation of $37,828 ($47,938 inflation-adjusted). This cost was slightly reduced due to using a specific harms scale (GHS-10), which provides a more conservative estimate than a broader gambling problems screen (Problem Gambling Severity Index; PGSI).

- *Financial impacts.* These represented the most significant change in our cost estimate over inflation, which is due to the following factors:
  - total losses increased from $5.8 billion to $7.4 billion
  - an 'intensification' of gambling since 2014, with spend being concentrated in fewer players losing larger amounts, as revealed by prevalence survey data
  - a dramatic increase in losses from the wagering sector, increasing from $847 million to $2.6 billion
  - a higher proportion of losses (80%+) attributable to moderate-risk and problem gamblers for wagering, EGMs and casino games
  - a more accurate methodology for costing excessive spend for individual products, as product-level spend data became available in the latest prevalence survey.

In summary, improvements in data quality and methodological refinements have led to mixed (upwards and lower) but generally minor differences in costed figures. Apart from inflation, the major reason for the increased cost of gambling is due to structural changes in the profile of losses incurred by people who gamble, especially on EGMs, wagering and casino table games.

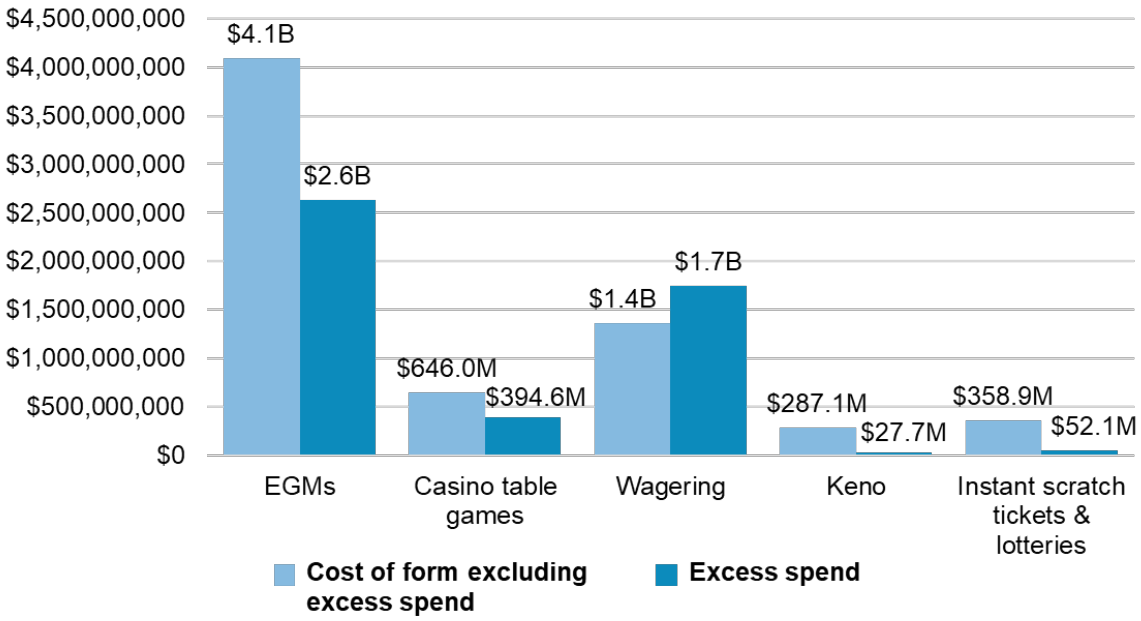
1.2.5 Costs related to different forms of gambling

Almost all costs from gambling stem from gambling problems and excessive expenditure, and the relative contribution of each form to problems is well understood. As a result, the total cost of gambling can be linked to each form with relatively few assumptions.

Figure 6 shows the attributable cost by product, with the excess spend component marked. EGMs and wagering account for most gambling costs. Although casino table games show a similar per-person risk profile, the lower participation rate includes a relatively lower contribution. Keno and instant scratch tickets have a much lower attributable cost.

Although we did not have available data to separate out the impact of lotteries specifically, other research suggests they contribute a negligible proportion to total gambling problems. In general, highly accessible, continuous electronic forms of gambling that facilitate potentially very large player losses contribute the most to the cost of gambling.

Figure 6: Costs attributable to each major gambling form



Note. In this table, 'B' refers to billions of dollars and 'M' to millions of dollars.

1.2.6 Policy measures to reduce the cost of gambling

There is limited evidence on proven measures for reducing costs from gambling-related harm (GRH), with most research focusing on individual-level interventions for problem gamblers rather than population-level measures. Nevertheless, expert opinion and real-world experience suggest some promising policy options such as:

- banning advertising
- mandating maximum play intervals
- implementing multi-operator self-exclusion schemes
- requiring operators to provide data
- increasing duties on operators.

Since EGMs represent the largest attributable source of costs, we focus on this specific form as an example. Comprehensive reviews have identified potential EGM interventions like modifying structural characteristics (for example, removing losses disguised as wins, reducing maximum bets), implementing mandatory universal pre-commitment systems with binding limits and restricting venue size, the number of EGMs per venue and EGM operating hours. Evaluating the potential benefits of untested policies is challenging given the absence of prior implementation, large-scale trials and detailed modelling. Considering case studies of implemented policies can provide valuable insights to the Victorian context.

Finland's EGM restrictions

- Finland implemented a series of EGM policies between 2019 and 2022, including reducing the number of EGMs, reduced loss limits for online gambling, mandatory identification and mandatory pre-commitment for land-based EGMs.
- These measures led to a 60% reduction in land-based EGM expenditure, which was not offset by online gambling, showing the effectiveness of availability restrictions and mandatory pre-commitment.
- Applying the effects of Finland's specific EGM measures to Victoria suggests potential cost reductions of $2.87 billion because of EGMs.

Norway's EGM bans and restrictions

- Norway implemented a ban on EGMs in 2007, then reintroduced them with mandatory pre-commitment. Before this, Norway had high EGM density and expenditure similar to the situation in Victoria.
- The EGM ban led to decreases in total gambling expenditure, helpline calls for EGM problems and referrals to problem gambling treatment. There were also reductions in population-wide problem gambling.
- Banning banknote acceptors on EGMs and restricting night-time gambling also reduced EGM expenditure and related helpline calls, with some limited substitution to other gambling forms.
- Applying the effects of Norway's combined banknote acceptor ban and night-time restrictions to Victoria suggests a potential 51.5% decrease in EGM-linked costs, equivalent to $3.46 billion in savings.

Western Australia's EGM restrictions

- WA only allows EGMs at a single casino, unlike other Australian states where EGMs are widely accessible in various venues.
- Comparing population data between WA and other states suggests this restricted EGM accessibility leads to 50% lower EGM participation, one-third lower gambling problems and harm and substantially reduced harm from EGMs.
- Reduced EGM use in WA accounted for most of the decreased gambling problems, with limited substitution to other forms.
- Applying WA's EGM restriction effects to Victoria suggests a potential 65.9% reduction in EGM-linked costs, equivalent to $4.34 billion in savings.

Tasmania's proposed mandatory pre-commitment system

- Tasmania has proposed[2] a mandatory pre-commitment system for EGMs using player cards and pre-set limits of $100 daily, $500 monthly and $5,000 annually as default values. These limits have not yet been implemented but are useful figures for modelling.
- Assuming a $5,000 annual limit per adult, with 20% of high-spending people who gamble getting an exemption up to $6,000, applying this system to Victoria would reduce EGM-linked excess spend costs by 97.6%, from $2.63 billion to $65 million.
- The effectiveness of this policy depends on the ease of obtaining limit increases and the extent of substitution to other gambling forms. Conservatively assuming a 20% diversion of expenditure to other forms, the estimated savings on EGM excess spend alone in Victoria would be $1.58 billion.
- Considering the causal effect of expenditure on gambling problems and associated harms, the total impact of an effective EGM mandatory pre-commitment scheme in Victoria covering all venues is conservatively estimated at $4.25 billion, or 63% of total EGM-linked costs.

[2] At the time of writing, Tasmania was committed to implementing a mandatory pre-commitment system for EGMs. However, in November 2024 the Tasmanian Government announced it would not be proceeding with the reforms

2. The social cost of gambling to Victoria

This chapter begins by describing the methodology used in the current study, including the framework, significant data sources and how key methodological concepts, such as HRQoL and uncertainty, have been approached (section 2.1). This is followed by the results section (section 2.2). The results section first presents summary tables, followed by discussions of each cost item, including a description, detailed methodology and identified costs.

2.1 Methodology

This section summarises the framework and data sources used and the key methodological processes and assumptions taken in the costing.

2.1.1 Framework

While some methods have been revised by new sources of data or an improved understanding of impacts, the 2023 costing will broadly follow the framework established in the previous Victorian economic costing (Browne et al. 2017b (Table 1). This framework closely aligns with previous frameworks used – for example, by the Productivity Commission (1999) and in the more recent Northern Territory (Whetton et al. 2018) and Tasmanian costings (SACES et al. 2021). Note, the framework includes broad areas of impact, including elements such as impacts to children, that cannot be costed, primarily due to lack of data.

Table 1: Cost of gambling framework

Cost category	Subcategory	Cost attributed to
Financial impacts	Total opportunity cost/excessive spend	Person who gambles and affected others
	Bankruptcy	
	• Cost of administration	Government
	• Unpaid debts	Affected others and community
	Illegal offshore wagering	Person who gambles and affected others
Emotional and psychological	Depression	Person who gambles
	Suicidal attempts – impact on the person who gambles	Person who gambles
	HRQoL impact of gambling harm on the person who gambles	Person who gambles
	HRQoL impact of gambling harm on young people who gamble	Person who gambles (not costed)
Relationships and family	Divorce and separation	
	• Financial cost	Person who gambles and affected others
	• Emotional distress to person who gambles	Person who gambles
	• Emotional distress to affected others	Affected others
	Experiences of violence	
	• Emotional distress to the person who gambles	Person who gambles
	• Emotional distress to affected others	Affected others

Cost category	Subcategory	Cost attributed to
	Suicide attempts of person who gambles – impact on affected others	Affected others
	Fatality by suicide of person who gambles – impact on affected others	Affected others
	HRQoL impact of gambling harm to affected others (adults)	Affected others
	HRQoL impact of gambling harm to affected others (children)	Affected others (not costed)
	Family and child welfare service	Government (not costed)
Crime	Police system cost	Government
	Court system cost	Government
	Corrections system cost	Government
	Costs to affected others	Affected others (not costed)
Productivity loss and work/study impacts	Productivity loss (to person who gambles and affected others)	Community
	Study impacts to affected others (children)	Affected others (not costed)
	Cost of job loss	
	• Loss of income	Person who gambles
	• Job search to the person who gambles	Person who gambles
	• Employer staff replacement costs	Community
	• Unemployment benefits	Government
	Cost of absenteeism	Community
	Cost of crime to business	Community
	Cost of fatality by suicide	Community and government
Cost to the Victorian Government and local governments	Policy, regulation, research (including treatment funding)	Government
	Direct costs to local governments in Victoria	Government
	Health and human services systems	Government
	Mental health sector	Government
	Homelessness services	Government
Cost to non-profit organisations	Provision of services related to gambling addiction	Community
Federal government costs	Online gambling	Government

2.1.2 Data sources

Based on this framework, we conducted a scan of updated data sources. As employed in the previous Victorian economic costing, 3 data sources are used for each category:

- the Victorian population prevalence
- the prevalence of the cost item
- the average cost per item.

Data concerning gambling participation, problems and expenditure were sourced directly from the recently conducted VPGHS. Where the relevant data was not available in that study – for example, with some less common harms such as bankruptcy and suicide attempts – we identified other Australian representative studies such as the NSW Gambling Survey 2019 (Browne et al. 2019). The bulk of the cost item sources follow the methodology established in the previous Victorian economic costing (Browne et al. 2017b), with more recent sources of data identified where possible.

All sources and any specific assumptions relating to each cost item are detailed in the results section. Where the methodology deviates from the previous costing, this is also discussed. Costs are presented in Australian dollars. Where possible, data was sourced for the 2022–23 financial year. When this was unavailable, the most recent data sources were identified, and Consumer Price Index increases were applied.

2.1.3 Key methodological concepts

This section outlines several key economic costing concepts and methods that are fundamental to our approach in estimating the social costs of gambling in Victoria:

- *Tangible versus intangible costs:* Our analysis distinguishes between tangible costs (for example, direct financial losses, healthcare expenses) and intangible costs (for example, emotional distress, decreased quality of life). Both are included in our total cost estimate, with intangible costs often representing a significant portion of the overall burden. This distinction is particularly evident in sections 2.2.3 (Financial impacts) and 2.2.4 (Emotional and psychological harm to the person who gambles).
- *Opportunity costs:* We consider the concept of opportunity cost, particularly in relation to excess gambling expenditure. This is based on the assumption that people with gambling problems would spend similarly to non-problem gamblers if not for their gambling issues. This approach is detailed in section 2.2.3 (refer to ‘Cost of excessive spend by people who gamble’).
- *HRQoL decrements:* A key component of our methodology involves quantifying and monetising the impact of gambling on quality of life. We use both direct and indirect methods to estimate declines in HRQoL (referred to in this report as ‘HRQoL decrements’), as explained in this section (refer to ‘Costing HRQoL impact’ and ‘Valuing HRQoL impacts in financial terms’), and applied in sections 2.2.4 (refer to ‘Cost of HRQoL impact of gambling harm on the gambler – emotional and psychological harm’) and 2.2.5 (refer to ‘Cost of HRQoL impact of gambling harm on affected others – emotional and psychological harm’).
- *Counterfactual discounting:* To account for the possibility that some harms might have occurred even in the absence of gambling problems, we apply a causality discount (usually 20%) to many of our estimates. This approach is used consistently throughout the costing, as noted in section 2.1.4 (refer to ‘Causality’).
- *Prevalence-based approach:* Our costing adopts a prevalence-based approach, estimating the costs associated with gambling problems across the full spectrum of severity, from low-risk to problem gambling. This is evident in our use of PGSI categories throughout the analysis. Also, due to a lack of a robust epidemiological model, our costing

generally focuses on a 12-month 'window', rather than attempting to calculate downstream life course impacts via an incidence-based approach.

- *Societal perspective:* We take a broad societal perspective in our costing, considering impacts on people who gamble, affected others, the government and the wider community. This comprehensive approach is reflected in the structure of our costing categories (sections 2.2.3 to 2.2.10).
- *Sensitivity analysis:* To account for uncertainties in our estimates, we provide upper and lower bounds for most cost items. This approach, detailed in section 2.2.1 (refer to 'Cost of gambling problems to Victoria – upper and lower bounds and bootstrapping'), allows for a range of plausible cost estimates and reflects the inherent uncertainty in economic costing exercises.
- *Attribution to gambling forms:* We attribute costs to different forms of gambling based on their relative contribution to gambling problems, as explained in section 2.3. This allows for a more nuanced understanding of which gambling products are associated with the greatest societal costs.

Costing HRQoL impact

The literature review (Appendix 5; 'Direct and indirect elicitation approaches' section) discusses direct and indirect elicitation approaches to establish declines in HRQoL due to gambling harm[3]. The review concludes that synthesising both approaches would draw on the strengths of each method and thereby represent an effective way of identifying HRQoL decrements.

The process identified in the review involves 2 main components: the 'scaling factor', which is the maximum health-related impact associated with severe GRH, and the 'curve', which is the shape of the slope from a minimal degree of gambling harms to the maximum level. The scaling factor is measured with respect to the degree of impact associated with most severe gambling harms or problems. To estimate this scaling factor, methods that ask people directly (using elicitation protocols like the time trade-off [TTO] and visual analogue scale [VAS], as assessed by experts or those experiencing problems) tend to deliver very consistent results. But, while using direct elicitation methods is likely to accurately assess the negative health impacts for more severe gambling problems, it might not be a good method to differentiate between low to moderate levels of gambling harm. In particular, direct methods may overestimate the degree of HRQoL impact for low levels of harm due to stigma, how it is framed and floor effects[4].

Therefore, the HRQoL curve for self-reported gambling harms is best identified using statistical or indirect methods that are not subject to response bias and can differentiate between small degrees of health impact. This method avoids the need to subjectively attribute harm to gambling. But, as discussed, particularly in relation to the impact of gambling problems, these methods are highly conservative as a measure of impact because they rely on screens such as the SF-6D or EQ5D, which tend to focus on physical health and mobility, rather than the psychosocial impacts that excessive gambling causes (Browne et al. 2016). They are therefore most useful to assess a relative degree of HRQoL for different harm levels (counts) and then scaled with respect to the maximum using the direct methods already mentioned.

The current study conducted a review to identify published research using HRQoL measures in similar populations to Victoria (in both Australia and New Zealand) (Appendix 5). This information was used to calculate HRQoL decrements associated with GRH. This was done by first establishing a maximum HRQoL decrement using directly elicited estimates and then scaling the

[3] Direct and indirect elicitation approaches refer to different ways of quantifying the impact of gambling harm on wellbeing. Direct approaches ask people to directly assess and report the impact of gambling harm on HRQOL. Indirect approaches do not directly ask about the impact of gambling harm but instead rely on pre-existing health measures that link responses to HRQOL scores.

[4] Floor effects occur when a measurement tool cannot distinguish between low levels of a condition because responses cluster at the lower end of the scale, limiting its ability to detect variations in severity.

curve identified using indirectly elicited methods to this maximum. Overall, we rely on direct elicitation methods for the absolute maximum degree of HRQoL impact, and on indirect elicitation methods to trace degrees of HRQoL from zero to this maximum, combining the strengths and avoiding the weaknesses of both methods.

Table 2 shows the studies we included and the highest mean decrements reported. For people who gamble, the average maximum mean disability weight was 0.45. This means that a person experiencing the most severe degree of gambling problems and harm is considered to have a 45% reduction in their overall health and wellbeing compared with someone in perfect health. Alternatively, the utility or 'worth' of living a year with severe gambling problems is treated as equivalent to living just under 6 months of healthy life. For affected others, the average maximum mean disability weight was 0.40.

Table 2: Direct method elicitation HRQoL decrements for people who gamble and affected others

	Maximum mean decrement		**Source**	**Method**
	Person who gambles	Affected others		
	0.46	0.36	Browne et al. 2016	TTO and VAS – general population
	0.41		Browne et al. 2016	TTO and VAS – experts
	0.58	0.34	Browne et al. 2017a	TTO and VAS – general population
	0.48		Browne et al. 2017a	TTO and VAS – experts
	0.28	0.38	Browne et al. 2022	TTO, VAS, SG, Rank ordering – experts
	0.50	0.50	Rockloff et al. 2019	TTA and VAS – general population
Average	**0.45**	**0.40**		
SD	0.10	0.07		
SE	0.04	0.04		
Weighted average	0.50	0.48		

A single study mapped harms via the GHS-10 to health utilities (Browne et al. 2022). Table 3 and Table 4 show the original indirectly elicited health utilities for people who gamble and affected others, scaled up to the maximum mean disability weights of 0.45 for people who gamble and 0.40 for affected others. This process allows health utility decrements to be identified for each score on the GHS-10 and GHS-10-AO. These decrements can be combined with the prevalence data from the VPGHS to calculate and cost the total burden of gambling harm in Victoria.

The disability weights identified by this method are consistent with those identified for other related conditions such as drug and alcohol addictions and common mental health disorders as produced by the Global Burden of Disease Study 2019 Disability Weights (Global Burden of Disease Collaborative Network 2020). For example, mild gambling problems have similar disability weights (around 0.10) as mild drug and alcohol dependency. The most severe gambling problems align with other severe addictions and moderate severity major depressive disorder.

Table 3: Health decrements for people who gamble

Original SF-6D decrement		Scaled to averaged maximum	
GHS-10 score	**SF-6D decrement**	**Scaling factor**	**Health utility decrement**
1	0.035	0.23	0.10
2	0.066	0.43	0.19
3	0.089	0.57	0.26
4	0.107	0.69	0.31
5	0.119	0.77	0.35
6	0.126	0.81	0.37
7	0.132	0.85	0.38
8	0.139	0.90	0.41
9	0.146	0.94	0.43
10	0.155		0.45

Table 4: Health decrements for affected others

Original SF-6D decrement		Scaled to averaged maximum	
GHS-10-AO score	**SF-6D decrement**	**Scaling factor**	**Health utility decrement**
1	0.019	0.17	0.07
2	0.035	0.30	0.12
3	0.050	0.43	0.17
4	0.064	0.56	0.22
5	0.076	0.66	0.26
6	0.086	0.75	0.30
7	0.094	0.82	0.32
8	0.102	0.89	0.35
9	0.109	0.95	0.37
10	0.115		0.40

Valuing HRQoL impacts in financial terms

There is no consistent method or source for estimating the value of a statistical life year (VLY). The federal government (Office of Impact Analysis, Department of Prime Minister and Cabinet 2023) recommends a VLY in 2023 as $235,000. This amount is derived from a study by Abelson (2008) that suggested a VLY of $151,000 in 2007 dollars. This value (adjusted for inflation) was used by the recent Productivity Commission (2020) report into mental health in Australia. There are also willingness-to-pay studies that use preference methods to estimate the value that individuals place on reducing the risk of death or disability. The results of these studies can be used to derive the VLY. For example, Shiroiwa et al. (2010) identified that the mean willingness-to-pay in Australia was AU$64,000 in 2008 dollars (equivalent to $93,678 in 2023).

Alternatively, international organisations such as the World Health Organization and the World Bank provide estimates of the VLY based on a proportion of a country's GDP per capita. This method has been used to cost the burden of mental health disorders (Arias et al. 2022). The World Health Organization recommends using one to 3 times GDP per capita to identify lower and upper bounds (Robinson et al. 2017). However, Lino et al. (2022) examined this in a systematic review and recommended using 0.5 to 1.5 times GDP per capita as low/high valuations. Recent Australian economic costings have used a variety of methods for valuing HRQoL impacts. For example, the 2018 Northern Territory costing (Whetton et al. 2018) used lower and upper values of $47,302 and $309,157. The upper value in both the Northern Territory and the Tasmanian reports (SACES et al. 2021) are based on Abelson's (2008) approach.

The current study uses GDP, which represents a more conservative valuation than that used by the Australian Government (Office of Impact Analysis, Department of Prime Minister and Cabinet 2023). Also, this method incorporates a tested methodology by which to approach upper and lower bounds. Therefore, the proxy used to value a year of life living with disability (YLD) in this study is GDP per capita ($97,435) and the lower and upper values are $48,718 and $146,153, which represent, respectively, 0.5 and 1.5 times GDP per capita as recommended by Lino et al. (2022).

To value other indirect emotional and psychological harms, such as the emotional distress associated with divorce and violence, the current study uses the same approach used in the previous Victorian costing (Browne et al. 2017b) by applying the proxy of the average payment received by victims of crime (Victims of Crime Assistance Tribunal [VOCAT] 2023).

Uncertainty

Economic costing typically involves a wide range of sources of uncertainty including:

- statistical uncertainty due to random sampling error in prevalence survey data
- methodological uncertainty due to choices made in the model of costing
- parameter uncertainty associated with nominal discounts (for example, 20% due to uncertainty regarding causality) or parameters (for example, putting a dollar figure on the utility of a year of human life).

At the end of each section detailing individual costed items, we attempt to address the major sources of contributing uncertainty. We use these to nominate reasonable bounds for the bottom-line estimate, depending on their degree of leverage in influencing the outcome. These are then combined in a parametric bootstrap to estimate an uncertainty for the total costing of gambling impact in Victoria.

2.1.4 General methodological comments

Several methodological assumptions were used in calculating the estimated cost of GRH in Victoria. General assumptions are discussed below, while those more specific to a particular cost item are discussed in the relevant results section.

Prevalence of problem gambling severity

Data on the prevalence of problem gambling severity in Victoria was sourced from the 2023 VPGHS. The Victorian Responsible Gambling Foundation provided this database to the research team. At the time our analyses were undertaken, the study was unpublished, and as such, is simply referred to as 'VPGHS' throughout this report. In this study, 5.31% were classified as a low-risk gambler (scores 1–2), 2.27% as a moderate-risk gambler (scores 3–7) and 0.93% as a problem gambler (scores 8+). This reflects a difference in composition of gambling across the PGSI from the source used in the previous costing (Browne et al. 2017b). For that study, Hare's (2015) calculations were used to identify the applicable prevalence rates, which in 2014 were estimated to be 8.9% low-risk, 2.8% moderate-risk and 0.8% problem gambling. Overall, there

appears to have been a decrease in the proportion of people gambling at lower risk levels and a corresponding increase in those experiencing more severe gambling problems.

Causality

The Productivity Commission (1999) discussed in detail the potential to inadvertently attribute adverse consequences to gambling. For example, there are situations where the person would still have that problem (for example, suicidal thoughts), even in the absence of gambling. To address this issue, the Productivity Commission used a 20% causality discount. The limitations around this method have been discussed, but in the absence of more data, as per the 2017 *The social cost of gambling to Victoria* report (Browne et al. 2017b), the current costing continues to use this methodological approach. It is generally referred to as a '20% causality discount', or within tables it is represented as '× 80%'.

Double-counting adjustments

We put procedures in place to avoid double counting items. For example, the study costed the HRQoL impacts to people who gamble as well as the costs associated with depression. Reporting this level of detail (when possible) is important in understanding the specific impacts of GRH on individuals. But it is likely that the psychological impacts associated with depression are adequately encompassed within the larger HRQoL cost item. Therefore, to avoid double counting, discounts have been applied in the calculations where applicable by subtracting the cost of the smaller harm (depression) from the larger harm (HRQoL).

Harm-attribution approach

The methodology primarily accounts for harms linked to gambling, which may lead to an underestimation of the total social cost of gambling in Victoria. For example, in relation to job loss, the costs of job loss due to gambling are included. But, in other cases, given the complex interplay of factors in gambling harm (Langham et al. 2016), job losses may be primarily due to another factor related to gambling problems (for example, alcohol use, illness related to stress). This approach was chosen due to data availability and also to avoid potential overestimation due to confounding factors. This study primarily accounts for harms fully linked to gambling, potentially underestimating the total social cost by not including harms partially linked to gambling. Future research might look to develop better methods for estimating these partially linked costs.

Comparisons with findings from the previous report

This report regularly refers to the 2017 *The social cost of gambling to Victoria* report (Browne et al. 2017b), which reported costs associated with 2014–15. When making comparisons with figures contained in that report, we have applied adjustments for inflation and population growth. This allows for greater clarity about whether the costs associated with a particular harm domain have increased or decreased over time.

Rounding

Due to rounding, figures and percentages may not add exactly to the totals shown. Attempts to recreate calculations using the rounded figures provided may yield slightly different, but broadly consistent, estimates. These minor discrepancies do not significantly impact the overall findings or conclusions of the study.

2.2 Results

This section details the data sources used and steps taken in estimating each of the cost items.

2.2.1 Summary results

We present summary tables detailing:

- the total cost of gambling harm in Victoria 2022–23 by cost category (summary, detailed)
- the total range identified by upper and lower bounds and bootstrapping
- the costs broken down by the primary bearer of the cost
- a comparison between the 2014–15 (Browne et al. 2017b) and 2022–23 costings.

These summary tables are followed by sections that present each individual cost item including item descriptions, detailed methodology (including source data) and a final cost estimate including upper and lower bounds.

Total costs of gambling problems to Victoria

The total cost of gambling problems in Victoria in 2022–23 is estimated to be around $14.1 billion (Table 5). The largest area of impact, comprising over a third of the cost, is associated with the financial impacts, followed by the emotional and psychological impacts to the person who gambles, and family and relationship harm, the latter of which includes emotional and psychological impacts to affected others.

Table 5: Cost of gambling problems to Victoria (2022–23) by cost category

Harm category	Cost	Contribution
Financial impacts	$5,153,283,215	36.52%
Emotional and psychological (gambler)	$3,271,102,307	23.18%
Relationships and family	$2,526,179,765	17.90%
Crime	$289,379,572	2.05%
Productivity loss and work/study impacts	$1,545,931,411	10.96%
Costs to the Victorian Government and local governments	$1,319,818,896	9.35%
Costs to non-profit organisations	$3,207,199	0.02%
Federal government costs	$1,526,761	0.01%
Total cost	**$14,110,429,126**	100.00%

Cost of gambling problems to Victoria, detailed

Table 6 shows the cost of gambling problems to Victoria across cost categories. The largest individual cost item is the opportunity cost of gambling spend at $4.8 billion, followed by the intangible HRQoL impacts to both the person who gambles ($3.0 billion) and affected others ($1.6 billion).

Table 6: Cost of gambling problems to Victoria (2022–23) by cost category, detailed

Harm category	Cost item	Cost	Detailed costs
Financial impacts	Total opportunity cost of excessive gambling spend	$4,844,268,411	
	Bankruptcy (total)	$3,585,294	
	• Cost of administration		$456,000
	• Unpaid debts		$3,129,294
	Illegal Offshore Wagering	$305,429,510	
Emotional and psychological	Depression	$199,565,524	
	Suicidal attempts: impact on the person who gambles	$32,329,463	
	HRQoL impact of gambling harm on the person who gambles	$3,039,207,321	
Relationships and family	Divorce and separation (total)	$358,268,488	
	• Financial cost		$18,112,879
	• Emotional distress to the person who gambles		$136,062,244
	• Emotional distress to affected others		$204,093,366
	Experiences of violence (total)	$349,581,743	
	• Emotional distress to the person who gambles		$119,524,192
	• Emotional distress to affected others		$230,057,551
	Suicide attempts of person who gambles – impact on affected others	$193,976,777	
	Fatality by suicide of person who gambles – impact on affected others	$14,700,652	
	HRQoL impact of gambling harm to affected others (adults)	$1,609,652,105	
Crime	Cost to Victorian justice system (total)	$289,379,572	
	• Police system cost		$3,918,402
	• Court system cost		$4,759,997
	• Corrections system cost (general)		$278,623,656
	• Corrections system cost (fraud)		$2,077,517
Productivity loss and work/study impacts	Productivity loss	$1,281,950,880	
	Cost of job loss (total)	$143,817,723	
	• Loss of income		$82,769,424
	• Job search to the person who gambles		$17,236,272
	• Employer staff replacement costs		$35,866,750
	• Unemployment benefits		$7,945,276

Harm category	Cost item	Cost	Detailed costs
	Cost of absenteeism	$65,011,852	
	Crime to business (total)	$26,220,632	
	• Petty theft or dishonesty		$17,454,484
	• Fraud		$8,766,148
	Cost of fatality by suicide	$28,930,325	
Cost to the Victorian Government and local governments	Policy, regulation, research (including treatment funding)	$129,911,236	
	Direct costs to local governments in Victoria	$261,468	
	Health and human services systems	$750,902,020	
	Mental health sector	$407,333,231	
	Homelessness services	$31,410,940	
Cost to non-profit organisations	Provision of services related to gambling addiction	$3,207,199	
Federal government costs	Online gambling	$1,526,761	
Total cost of gambling problems to Victoria		**$14,110,429,126**	

Cost of gambling problems to Victoria – upper and lower bounds and bootstrapping

Health economic costings inevitably incorporate sources of uncertainty due to statistical sampling error, methodological choices and parameter selection. Each of the sections in this report incorporates a discussion of major sources of uncertainty and provides a rationale for nominating upper and lower bounds for the estimate. For example, there is a lack of consensus in the literature regarding costing lost utility to a year of healthy life in dollar terms. This nominated parameter has a high degree of leverage in determining the HRQoL impacts to the person who gambles costed in this study. By providing this breakdown, we allow others the opportunity to arrive at a different costing by incorporating different assumptions. But the main estimates provided in this report incorporate our best evaluation of the most reasonable parameter assumptions and/or those with the highest degree of precedent in other costing studies.

The high and low confidence intervals for each costed component (Table 7) are, in general, not symmetrical around the best estimate. For example, our best estimate for costing the impact of fatality by suicide references data that is known to be a lower-bound (or highly conservative) estimate of the proportion of suicides linked to gambling. In other jurisdictions where there is better information on contributing factors, the proportion of suicides linked to gambling is substantially higher. This conservative choice therefore represents a situation where our costed estimate represents the lower bound, and we make reasonable extrapolation regarding an upper bound. Given this lack of symmetry, for the purpose of calculating a combined uncertainty, we treated each cost component as independent random variables with a triangular probability distribution, with a minimum, mode and maxima set to the lower bound, costed estimate and upper bound, respectively. The uncertainty for the total cost was calculated using parametric bootstrapping (3,000 replications), summing each of these cost components treated as random variables. As shown in Table 7, the bounds identified for each category result in an estimated range of the cost of gambling problems to Victoria to be valued at between $12.7 billion and $17.0 billion.

One limitation of this approach is that it treats each source of error as independent and does not account for correlated errors between cost components. For example, the population prevalence of problem gambling feeds into several cost components, and any sampling error in this statistic creates positively correlated errors in each. While this caveat should be borne in mind, it is also the case that the greatest source of uncertainty is due to nominated parameters or statistics that are unique to each component. We therefore consider this an acceptable limitation. Nevertheless, the breakdowns provided allow for readers of this report to calculate alternative costings if they wish, incorporating different statistics (for example, problem gambling prevalence), assumptions (for example, monetary valuation of HRQoL) or methods (for example, costing excessive spend associated with problem gambling only, rather than also incorporating low- and moderate-risk excessive spend).

Cost of gambling problems to Victoria, by bearer of the cost

Table 8 shows the costs of gambling problems in Victoria broken down by harm domain. People who gamble bear the greatest burden of total cost at around $7.3 billion (51.7%), followed by those close to them (affected others), at $3.8 billion (26.6%). The cost to the Victorian community is $1.4 billion, primarily relating to productivity loss. The direct cost to the Victorian Government and local governments is estimated at $1.6 billion, equivalent to about two-thirds of the $2.5 billion revenue derived from gambling taxes and levies. Note that this breakdown allocates the financial impacts across both people who gamble and affected others. This was calculated by taking the proportion of those who gamble who are in a relationship and splitting their excess spend with an affected other. While not 100% of those in a relationship who gamble share finances, in other cases, gambling losses impact more than one significant other (for example, children or parents). Therefore, the current approach appears to be an effective compromise. Overall, the proportion breakdown across bearer of cost is similar to that of the 2017 costing (Browne et al. 2017b).

Table 7: Summary of cost components with upper and lower bounds

Harm category	Cost item	Cost	Lower bound	Upper bound
Financial impacts	Total opportunity cost of excessive gambling spend	$4,844,268,411	$3,294,268,110	$5,814,420,341
	Bankruptcy (including cost of administration and unpaid debts)	$3,585,294	$1,257,998	$6,243,894
	Illegal offshore wagering	$305,429,510	$305,429,510	$323,244,838
Emotional and psychological	Depression	$199,565,524	$189,587,247	$794,265,227
	Suicidal attempts – impact on the person who gambles	$32,329,463	$30,712,990	$226,472,113
	HRQoL impact of gambling harm on the person who gambles	$3,039,207,321	$1,427,985,494	$4,650,429,147
Relationships and family	Divorce and separation (including financial cost and emotional distress to the person who gambles and affected others)	$358,268,488	$322,441,640	$552,103,450
	Experiences of violence (total)	$349,581,743	$332,102,656	$367,060,830
	Suicide attempts of the person who gambles – impact on affected others	$193,976,777	$74,357,765	$410,393,300
	Fatality by suicide of person who gambles – impact on affected others	$14,700,652	$14,700,652	$29,192,660
	HRQoL impact of gambling harm to affected others (adults)	$1,609,652,105	$707,837,664	$2,511,466,545
Crime	Cost to Victorian justice system (including police system, court system and correction system costs)	$289,379,572	$289,379,572	$516,703,618
Productivity loss and work/study impacts	Productivity loss	$1,281,950,880	$506,370,598	$3,204,877,201
	Cost of job loss (including loss of income, job search, staff replacement costs and unemployment benefits)	$143,817,723	$121,139,048	$168,538,730
	Cost of absenteeism	$65,011,852	$65,011,852	$113,273,085
	Crime to business (including petty theft and fraud)	$26,220,632	$23,140,177	$29,300,475
	Cost of fatality by suicide	$28,930,325	$28,930,325	$46,009,666

Harm category	Cost item	Cost	Lower bound	Upper bound
Cost to the Victorian Government and local governments	Policy, regulation, research (including treatment funding)	$129,911,236	$105,052,189	$147,797,189
	Direct costs to local governments in Victoria	$261,468	$248,395	$274,541
	Health and human services systems	$750,902,020	$220,345,701	$1,281,458,339
	Mental health sector	$407,333,231	$407,333,231	$498,924,414
	Homelessness services	$31,410,940	$22,347,994	$129,355,504
Cost to non-profit organisations	Provision of services related to gambling addiction	$3,207,199	$3,065,724	$5,686,042
Federal government costs	Online gambling	$1,526,761	$1,450,423	$1,832,113
Total (lower and upper bounds are 95% confidence interval via parametric bootstrapping)		**$14,110,429,126**	**$12,723,695,981**	**$17,026,445,713**

Note: Some estimates are highly conservate and therefore also represent lower bounds.

Table 8: Cost of gambling problems to Victoria (2022–23), by bearer of cost

Harm category	People who gamble		Affected others		Community		Government	
	Cost	Percentage	Cost	Percentage	Cost	Percentage	Cost	Percentage
Financial impacts	$3,656,285,524	71.0%	$1,494,977,044	29.0%	$1,564,647	0.03%	$456,000	0.01%
Emotional and psychological (gambler)	$3,271,102,307	100.0%						
Relationships and family	$264,642,875	10.5%	$2,261,536,890	89.5%				
Crime							$289,379,572	100.0%
Productivity loss and work/study impacts	$100,005,696	6.5%			$1,437,636,156	93.0%	$8,289,560	0.5%
Costs to the Victorian Government and local governments							$1,319,818,896	100.0%
Costs to non-profit organisations					$3,207,199	100.0%		
Federal government costs							$1,526,761	100.0%
	$7,292,036,402	51.7%	**$3,756,513,934**	26.6%	**$1,442,408,001**	10.2%	**$1,619,470,788**	11.5%

Note: The sum of percentages in each row equals 100%.

Comparison of cost estimates, 2014–15 and 2022–23

After allowing for inflation and population increase, the overall cost has increased by around 35% since the previous costing (Browne et al. 2017b). Table 9 details the changes across major cost categories.

Table 9: Cost of gambling problems to Victoria 2014–15 and 2022–23, by cost category

Harm category	2014–15	2022–23	% change
Financial impacts	$2,020,853,677	$5,153,283,215	155.01%
Emotional and psychological (gambler)	$2,387,911,815	$3,271,102,307	36.99%
Relationships and family	$3,281,250,134	$2,526,179,765	–23.01%
Crime	$150,178,631	$289,379,572	92.69%
Productivity loss and work/study impacts	$896,234,247	$1,545,931,411	72.49%
Costs to the Victorian Government and local governments	$1,717,120,066	$1,319,818,896	–23.14%
Costs to non-profit organisations	–	$3,207,199	–
Federal government costs	–	$1,526,761	–
Total	**$10,453,548,569**	**$14,110,429,126**	34.98%

Note: Cost to non-profit organisations and federal government were not included in the 2014–15 costing.

The bulk of the increase is due to the financial impacts of gambling harm. Table 10 provides explanations about where there have been significant changes in the costs over time.

Table 10: Reasons for cost changes from 2014–15 and 2022–23

Harm category	Reasons for change
Financial impacts	• The total losses to gambling increased from $5.8 billion to $7.4 billion. • There was an 'intensification' of gambling since 2014, with fewer players nevertheless losing larger amounts. • There was a dramatic increase in wagering in 2023: $847 million to $2.6 billion, where spend is concentrated in at-risk gamblers. • A higher proportion of losses linked (+80%) to moderate-risk and problem gamblers for wagering, EGMs and casino games in 2023.
Emotional and psychological (gambler)	• There was a significant increase in the cost of HRQoL impacts to people who gamble. This was primarily due to a large increase in the proxy used for this harm (from $47,938 equivalent in 2014 to $97,435). The proxy used in this study (GDP) is more in line with other economic costings. • Note that the use of the GHS-10 resulted in a slightly lower cost than otherwise would have been seen with the PGSI (used in the 2014 costing). • There was a decrease in the costs associated with suicide since 2014. This is due to more accurate data, a more conservative approach regarding low-risk gambling and not costing suicidal ideation.
Relationships and family	• Overall, the costs associated with affected others have reduced. This is mostly due to the use of updated and better data associated with suicide and a more conservative costing of divorce.

Harm category	Reasons for change
	• But there was a large increase in the costs associated with violence since 2014 due to the use of updated and better data that identified a larger number of affected others impacted than conservatively estimated in the previous study. There was also a larger proportion of people who gamble reporting experiences of violence compared with the previous study.
Crime	• Increases are due to longer sentencing durations based on newer more detailed information. • The 2014 costing did not include costs associated with major fraud.
Productivity loss and work/study impacts	• Increases in the cost of productivity loss was due to the use of data that allowed the impacts to affected others to be included. There were also lower prevalence rates for low-risk gambling in the updated and more representative data source. • Cost of job loss, absenteeism, crime and the cost of suicide to business reduced since 2014 due to the use of more representative data.
Costs to the Victorian Government and local governments	• Overall, the costs associated with policy, regulation, research and treatment services have increased significantly. This is mostly due to the heightened scrutiny and increased resource allocation following the Royal Commission into the Casino Operator and Licence in Victoria (2021). • The direct costs to local governments decreased compared with the adjusted 2014–15 cost, which is due to the lower number of EGM application decisions in VGCCC hearings in 2022–23. • Despite a slight increase in the costs associated with the mental health sector due to a higher estimate of the proportion of people who gamble using mental health services in 2022–23, the overall share of total health and human service expenditure due to gambling problems has decreased since 2014–15. This reduction is likely due to the use of a more conservative approach in estimating the number of those who gamble with wellbeing issues, which offset the increase in mental health sector costs.
Costs to non-profit organisations	Not previously costed.
Federal government costs	Not previously costed.

2.2.2 Detailed results

This section presents individual cost items, including descriptions, detailed methodologies and calculations, and the estimated cost incorporating upper and lower bounds. These are presented by major harm category:

- financial impacts
- emotional and psychological impacts to the person who gambles
- relationships and family
- crime
- productivity loss and work/study impacts
- costs to the Victorian Government and local governments
- costs to non-profit organisations
- federal government costs.

2.2.3 Financial impacts

Gambling expenditure in Victoria

The Victorian Gambling and Casino Control Commission (VGCCC) is responsible for monitoring revenue from the gambling industry in Victoria. The VGCCC provided the data reported in Table 11 on request.

Table 11: Industry reported gross revenue/gambler losses for the 2022–23 financial year

Gambling form	Gross revenue/gambler loss
Gaming machines – hotels and clubs	$3,021.7 million
Melbourne casino – gaming machines	$393.3 million
Melbourne casino – table games	$589.9 million
Lotteries (VIC only)	$763.8 million
Wagering – wagering and betting licensee Tabcorp	$802.6 million
Wagering – other entities	$1,785.2 million
Keno – keno licensee TLC	$28.9 million
Keno – keno licensee Lottoland	$2.9 million
Keno – other entities	$17.6 million
Total	**$7,405.9 million**

Notes: Total reported revenue from Crown Casino Melbourne in 2023 was $983.2 million. Separate revenue for 2023 for EGMs and table games not available. But in 2020 and 2021 approximately 60% of revenue was derived from table games, so we have applied the same proportions to the 2023 figures. Crown Casino also offers wagering, but this income is reported together with non-gaming revenue and therefore the current analysis cannot incorporate these gambling losses.

Cost of excessive spend by people who gamble

This costing follows the methodology and rationale of prior costing studies to treat the differential of average spend between non-problem gamblers and at-risk gamblers as 'excessive' expenditure (Browne et al. 2017b; Productivity Commission 1999; VCEC 2012). This involves combining self-reported spend data from gambling prevalence surveys with industry-reported total gambler losses.

Rationale for costing excessive spend

In Appendix H of its report the VCEC (2012) provides a detailed rationale for its approach to estimating the economic costs of excessive gambling expenditure by problem gamblers in Victoria.

The VCEC's methodology is largely based on the framework developed by the Productivity Commission in its 1999 inquiry report. The Productivity Commission's approach compares 'normal' levels of gambling expenditure (assumed to be the average expenditure by non-problem gamblers) to estimated actual expenditure by problem gamblers. The difference is considered excessive expenditure. Using consumer surplus calculations, this excess is then converted into an economic cost estimate.

While noting some criticisms, the VCEC observed that the Productivity Commission's (1999) approach has been used as a benchmark in several subsequent studies, such as a 2011 study on the economic and social impacts of gambling in Tasmania. In the absence of a clearly superior

alternative, the VCEC considered the Productivity Commission's framework to be an appropriate foundation.

The VCEC acknowledged the gambling industry's objections to aspects of the Productivity Commission's methodology. For instance, Clubs Australia argued that many of the assumptions underpinning the Productivity Commission's calculations were invalid. But the VCEC ultimately determined that the Productivity Commission's approach, with some modifications, was a reasonable basis for estimating the economic costs of excessive problem gambling expenditure, given the available data. To address uncertainties around key inputs and assumptions, the VCEC conducted sensitivity analysis. This involved testing different expenditure share assumptions for those categorised as problem gamblers and the level of 'normal' expenditure. The VCEC found the results were most sensitive to expenditure share assumptions. To account for this uncertainty, the VCEC reported a range of cost estimates.

The VCEC ultimately determined that the economic cost of excessive spend was between $1 billion and $1.4 billion in 2010–11. Similarly, Browne et al. (2017b) costed excessive spend at $1.06 billion in 2017, based on 2014 prevalence survey data. The 2017 costing refined the methodology slightly to cost not only excessive spend by problem gamblers but also low-risk and moderate-risk groups to include the entire spectrum of gambling problems. But the authors discounted the cost attributable to all groups (including problem gamblers) based on the association of spend with self-reported financial gambling harms. This yielded a discount of 90% to problem gamblers, 80% to moderate-risk and 40% to low-risk gamblers. These discounts provide for the fact that at-risk gamblers may be deriving some extra utility over and above non-problem gamblers from their excessive spend, but the utility proportion or 'value for money' tends to decrease with increasing gambling problems. This is arguably a more coherent approach, since if non-problem gamblers average spend is used to determine a baseline 'reasonable' spend, and low-risk and moderate-risk gamblers spend many times more than this, and also report more financial harms than non-problem gamblers, then it is hard to justify excluding low-risk and moderate-risk gamblers from the calculations. Conversely, if only excessive spend among problem gamblers is costed, and low-risk and moderate-risk spend is treated as 'not excessive', then it is difficult to justify costing the differential between problem gamblers and non-problem gamblers, rather than with respect to low-risk or moderate-risk averages. Nevertheless, we present both approaches (costing 100% of problem gamblers only versus adopting a sliding scale to all at-risk gamblers) for comparison. Discounting based on a sliding scale across PGSI groups tends to produce estimates between 15% and 20% lower than if excessive spend among at-risk groups were fully costed, but slightly higher than fully costing problem gamblers only.

Data sources

While the prior prevalence survey only asked about total gambling spend (across all forms), the most recent survey asked about spend on each form individually. We take advantage of this increased resolution to calculate excessive spend for major gambling forms individually.

Between 2019 and 2023, the Victorian population grew by 5.5%. But, based on prevalence survey case weights, the total number of people who gamble in Victoria decreased from 3.39 million to 2.77 million. The total population problem gambling prevalence rate increased from 0.7% to 0.9%, while total gambling participation decreased from 69% to 53% due to a decrease in non-problem and low-risk gamblers. Total industry-reported gambling losses, as provided by the VGCCC (on request), grew from $5.8 billion to $7.4 billion. Given that problem gamblers spend many times more than non-problem gamblers, this trend can be described as an apparent intensification of gambling consumption, with a greater share of losses being concentrated among fewer players. Overall, the prior costing study (Browne et al. 2017b) found that spend by those in at-risk categories accounted for 76.7% of total gambling losses.

Combining self-reported losses with industry-reported data

Based on self-reports in these population surveys, implied total gambling losses based on self-reports were $3.4 billion in 2023, as compared with $1.8 billion in 2018–19.[5] Self-reported gambling expenditure therefore almost doubled in this period, while industry-reported revenue increased by only about one-third. In general, people who gamble are known to significantly underestimate their losses: an observation supported by the discrepancy between implied population self-reported aggregated losses and VGCCC industry data shown in Table 11. Previous costing studies, including the Productivity Commission (1999), VCEC (2012) and Browne et al. (2017b), therefore focused on estimating the proportion of spend linked to at-risk gamblers based on self-reports, and then applying this proportion to industry reported losses. This approach requires an assumption that at-risk or problem gamblers underestimate their losses at a similar proportional rate as non-problem gamblers. Relatively little research has investigated this question, but there appears to be no empirical or strong theoretical arguments in favour of a differential bias in reporting. On the other hand, Braverman et al. (2014) directly investigated this question, finding that non-problem gamblers and problem gamblers underestimated their losses at a similar proportional rate. There appears to be few methodological concerns in scaling up self-reported spend proportionately.

The most recent gambling prevalence survey implies aggregate subjective estimates of expenditure more similar to that reported by financial data. This is almost certainly due to the way in which gambling spend was elicited. In 2014 (Hare 2015) only a single question addressed a person's total spend across all forms. In 2023 respondents were asked about each form that they played individually, and we summed these figures to yield a total yearly spend. This more detailed questioning has been shown to provide more accurate responses (Wood and Williams 2007), which are closer to the true industry reported losses. The change in questioning does not have a direct impact on the comparison of the economic cost between these periods, since self-reported spend is scaled to industry data in both periods: only the relative differences across PGSI categories affect the costing.

Outliers, winsorising and robust means

As the VCEC noted, the key factor influencing the costing of excessive spend is the relative proportion of losses linked to problem gamblers, which is driven by self-reported gambling problems and self-reported spend. It is well known that, on an individual level, people are unreliable at reporting their own gambling expenditure. But this is not necessarily a major problem, since random error is reduced when calculating group averages by a factor of the square root of N. Nevertheless, since monetary spend is intrinsically overdispersed (that is, subject to strong positive skew), this means it can be disproportionately affected by positive outliers due to a combination of a genuine overdispersion (for example, due to differences in compulsion or discretionary income) as well as reporting errors. This reflects the underlying 'long tail' in gambling spend across individuals, which suggests not only the presence of gambling problems but also large individual differences in disposable income to support non-problem gambling.

In random-digit dial computer-assisted telephone surveys, spend is usually noted in terms of weekly, monthly or yearly units, and multiplied by 52, 12 or one to yield a common yearly denominator. Although this is likely the best practical means to elicit spend, it can also contribute to overdispersed noise. This noise can be a problem when the number of cases is small, such as for problem gamblers (82 cases in the 2023 survey). To illustrate, the maximum yearly spend in

[5] Based on our analysis of each of these population prevalence surveys. Self-reported gambling spends are populated weighted and aggregated to produce a total implied population spend.

the 2023 survey was $5.3 million, reported by a single moderate-risk gambler. These cases can exert a high degree of leverage on group mean estimates.

Given this, we strongly recommend using some form of robust measure of central tendency when dealing with gambling loss data (Auer and Griffiths 2017). One possible option is winsorising – for example, setting scores beyond the Nth (for example, 99th) percentile to the Nth percentile score. But this involves some researcher degrees of freedom in terms of choosing the percentile threshold value, and a single threshold may not be optimal when dealing with subgroups of different sizes. We therefore adopted Hampel et al.'s (1986) robust means strategy, which is a model-based approach to reducing the weight of outliers that exert excessive leverage, using the default MM-estimator implementation by the *rlm* function in the MASS R-package (Venables and Ripley 2002). This approach has the benefit of removing one source of 'researcher degrees of freedom' in selecting a winsorising threshold, and it is intrinsically adaptable to the different sample sizes and distributions across subgroups (PGSI categories).

A final note is made regarding interpretation of mean spend data, robust or otherwise, in the presence of a highly skewed distribution. In normally distributed data, the mean converges to the median and therefore intuitively reflects a typical case. This is not so in the context of highly skewed data in which the mean captures an average that is highly influenced by a long tail of high-spending individuals. Nevertheless, in this application the mean (not median) is the statistic of interest, since multiplying the mean spend by the number of people in each subgroup is an unbiased estimator of the group total spend.

Results for excessive spend

Table 12 shows our excess spend calculations for each form by PGSI group. These calculations are based on robust means applied to self-report population data and are scaled to match industry-reported losses for each form. The first 2 columns show the sample N and the population weighted N for each risk category. Lotteries and scratch tickets had the highest participation rate, while Keno had the lowest. It is important to note that people who gamble may spend money on multiple forms, and the available data do not attribute gambling problems to a given form. So, while 64 problem gambler respondents to the prevalence survey indicated having spent money on lotteries and scratch tickets, this was not always or likely often their main form of gambling.

The following columns summarise average and aggregate spend by form and PGSI category. For example, the mean spend among non-problem gamblers on lotteries and scratch tickets was estimated at $345, while for problem gamblers it was $971. After applying population weights, this implies that just 4.6% of total population spend on this form ($35 million of $764 million) was made by problem gamblers. But, in the case of EGMs, the robust and scaled average reported spend by problem gamblers was $62,393, 2 orders of magnitude higher than the average spend of non-problem gamblers ($532). After applying population weights, this implies that 66.6%, or $2.27 billion of total EGM losses of $3.41 billion, was incurred by problem gamblers. Only 5.5% of EGM losses are incurred by non-problem gamblers.

The remaining columns show the calculations to transform these figures into 'excessive' spend and apply one of 2 costing models. First, the average spend for non-problem gamblers is deducted from the spend of all at-risk categories. This component of at-risk gamblers' spend is treated as 'rational' expenditure on an entertainment product. Following the VCEC, the excessive spend among low-risk and moderate-risk groups can be ignored and only cost that of problem gamblers. This yields a total estimated cost of $3.93 billion, of which the large bulk is accounted for by EGMs ($2.26 billion) and wagering ($1.29 billion). Following the approach of Browne et al. (2017b) and discounting low-risk, moderate-risk and problem gamblers by 0.4, 0.8 and 0.9 respectively yields a total cost of $4.84 billion and a similar pattern with respect to form. Aggregating results across all forms, 78.5% of gambling losses are incurred by low-risk, moderate-risk and problem gamblers combined, with problem gamblers alone accounting for 53.0% of the total.

Table 12: Excess spend calculations for each form by PGSI group, based on robust means

Gambling form	PGSI	N		Aggregate spend		Average spend		Excess spend costings relative to NPGs					
		Sample	Population (weighted)	Population $	% by PGSI group	Per person	Excess above NPG	Total		PG only		LR, MR, PG, discounted	
								%	$	%	$	%	$
EGMs	NPG	681	355,598	$189,194,744	5.5%	$532	$0	0.0%	$0	0.0%	$0	0.0%	$0
	LR	166	85,228	$293,827,636	8.6%	$3,448	$2,916	7.3%	$248,482,499	0.0%	$0	2.9%	$99,392,999
	MR	114	64,568	$656,037,146	19.2%	$10,160	$9,628	18.2%	$621,684,156	0.0%	$0	14.6%	$497,347,324
	PG	60	36,477	$2,275,920,474	66.6%	$62,393	$61,861	66.1%	$2,256,513,069	66.1%	$2,256,513,069	59.5%	$2,030,861,762
	Total			*$3,414,980,000*				*91.6%*	*$3,126,679,723*	*66.1%*	*$2,256,513,069*	*76.9%*	*$2,627,602,086*
Wagering	NPG	1,242	565,267	$346,735,807	13.4%	$613	$0	0.0%	$0	0.0%	$0	0.0%	$0
	LR	235	108,748	$274,153,600	10.6%	$2,521	$1,908	8.0%	$207,447,285	0.0%	$0	3.2%	$82,978,914
	MR	115	59,082	$663,623,852	25.6%	$11,232	$10,619	24.2%	$627,383,052	0.0%	$0	19.4%	$501,906,442
	PG	51	28,217	$1,303,286,740	50.4%	$46,187	$45,574	49.7%	$1,285,978,136	49.7%	$1,285,978,136	44.7%	$1,157,380,322
	Total			*$2,587,800,000*				*82.0%*	*$2,120,808,474*	*49.7%*	*$1,285,978,136*	*67.3%*	*$1,742,265,678*
Casino table games	NPG	289	135,553	$75,832,553	12.9%	$559	$0	0.0%	$0	0.0%	$0	0.0%	$0
	LR	102	48,799	$43,445,406	7.4%	$890	$331	2.7%	$16,145,651	0.0%	$0	1.1%	$6,458,261
	MR	61	33,135	$121,681,637	20.6%	$3,672	$3,113	17.5%	$103,145,049	0.0%	$0	14.0%	$82,516,039
	PG	28	16,746	$348,960,403	59.2%	$20,838	$20,279	57.6%	$339,592,069	57.6%	$339,592,069	51.8%	$305,632,862
	Total			*$589,920,000*				*57.6%*	*$458,882,769*	*57.6%*	*$339,592,069*	*66.9%*	*$394,607,162*
Lotteries and scratch tickets	NPG	3,527	1,692,724	$584,355,257	76.4%	$345	$0	0.0%	$0	0.0%	$0	0.0%	$0
	LR	374	191,136	$91,207,856	11.9%	$477	$132	3.3%	$25,224,827	0.0%	$0	1.3%	$10,089,931
	MR	134	75,161	$52,687,649	6.9%	$701	$356	3.5%	$26,740,739	0.0%	$0	2.8%	$21,392,591
	PG	64	36,622	$35,549,238	4.6%	$971	$625	3.0%	$22,906,846	3.0%	$22,906,846	2.7%	$20,616,162
	Total			*$763,800,000*				*9.8%*	*$74,872,413*	*3.0%*	*$22,906,846*	*6.8%*	*$52,098,684*

Gambling form	PGSI	N		Aggregate spend		Average spend		Excess spend costings relative to NPGs					
		Sample	Population (weighted)	Population $	% by PGSI group	Per person	Excess above NPG	Total		PG only		LR, MR, PG, discounted	
								%	$	%	$	%	$
Keno	NPG	129	68,150	$10,628,055	21.5%	$156	$0	0.0%	$0	0.0%	$0	0.0%	$0
	LR	28	14,245	$4,437,400	9.0%	$312	$156	4.5%	$2,215,926	0.0%	$0	1.8%	$886,371
	MR	20	11,463	$12,352,644	25.0%	$1,078	$922	21.4%	$10,565,026	0.0%	$0	17.1%	$8,452,021
	PG	16	10,169	$21,981,901	44.5%	$2,162	$2,006	41.3%	$20,396,011	41.3%	$20,396,011	37.2%	$18,356,410
	Total			*$49,400,000*				*67.2%*	*$33,176,963*	*41.3%*	*$20,396,011*	*56.1%*	*$27,694,801*
Total				**$7,405,900,000**				**78.5%**	**$5,814,420,341**	**53.0%**	**$3,925,386,131**	**65.4%**	**$4,844,268,411**

Notes: Calculations were conducted with unrounded values but are reported as rounded values. Numbers and dollars are rounded to 0 decimal places, and percentages to 1 decimal place. PGSI groups are NPG = non-problem gambler, LR = low-risk gambler, MR = moderate-risk gambler and PG = problem gambler, using the original cutoffs. Discounting is 0.4 for LR, 0.8 for MR and 0.9 for PG.

Uncertainty, assumptions and reasonability tests

We concur with the VCEC that the argument for basing all calculations on differential mean spend from non-problem gamblers is a strong one. Although there are marked individual differences in spend within each PGSI risk category, there is little evidence that at-risk gamblers have, on average, systematically more disposable income than non-problem gamblers. It is therefore reasonable to assume that non-problem gamblers provide a good baseline for average rational expenditure and that PGSI subgroup spend in excess of this amount should be treated as not yielding a consumer surplus in terms of recreational entertainment. Nevertheless, estimates of excessive cost can vary significantly depending on what components of spend by at-risk gamblers is treated as excessive. The discounted costing of $4.84 billion lies between other approaches that fully cost low-risk and moderate-risk losses ($5.81 billion) versus excluding those categories completely ($3.93 billion), with the former figure reflecting an upper bound for estimates of excessive spend.

A large component of the excessive spend in the present calculation is affected by the large estimates of average spend by problem gamblers on EGMs ($62,393 per annum) and wagering ($46,187 per annum). At first glance, these figures may appear to be unreasonably large. But as mentioned above, means for positively skewed data do not reflect the median or typical person who gambles with problems but also reflect the long tail of extreme spends by people with higher net worth/income and gambling problems. This feature does not represent a violation of the assumptions of the calculation for aggregate spend since it applies equally to non-problem gamblers and other groups. That is, we would expect non-problem gamblers to include a similar skewed proportion of high net-worth/income people, and this is borne out of the positively skewed gambling expenditure data for this group. Likewise, the mean income in Australia was $83,700 in 2023 (ABS 2023b), significantly higher than the median of $54,900.

Gambling problems tend to self-resolve within a few years, in part due to an inability for problem gamblers to financially support the behaviour. Considering access to debt and savings, a yearly spend of a similar magnitude to someone's income would be necessary to create such an exhaustion of funds. In a survey of people in the UK who gamble and sought treatment, Baker-Frampton's (2023) sample included 2,427 men who reported spending an average of £1,980 a month before seeking treatment, which corresponds to $45,600 per year in Australian dollars. Considering slightly higher incomes in Australia and an underestimation of losses (Baker-Frampton's data is self-report), this figure is in line with our figures for problem gamblers.

Further pointing to the reasonability of these estimates, they are very similar to that calculated from the 2014 Victorian prevalence survey. Low-risk, moderate-risk and problem gamblers accounted for 76.7% of gambling expenditure in 2014, as compared with 78.5% in the present calculation. Similarly, Volberg et al. (2024) found that 5.1% of people in Connecticut who gamble accounted for 75.1% of gambling revenue. In Australia, Banks (2011) found that among loyalty card holders, 2% of people who gamble accounted for 80% of revenue. Nevertheless, a review by GREO (2019) covering attempts to estimate the proportion of revenue from problem gamblers found highly variable (1–86%) results due to differences in data collection, time and place of the study, and the specific kinds of gambling examined.

Although the estimated mean spends by problem gamblers do not appear unreasonable and are consistent with figures calculated from the prior prevalence study, the low prevalence of this group includes that the mean estimates are based on relatively few self-reports: 60 and 51 cases for EGMs and wagering, respectively. Despite the use of robust methods, bootstrapping confirms that the 95% confidence interval for the population lies between approximately 50% and 150% of the sample estimates. The wide confidence interval is to be expected, given the low N and the strong overdispersion. For an absolute lower bound estimate, in which both EGMs and wagering problem gambling spend estimates are treated at the 2.5th probability percentile, this would lead to a minimum discounted costing of $3.3 billion. But, given the key statistic (relative spend of at-

risk to non-problem gambling individuals) is highly consistent with the prior prevalence survey, we view the maximum-likelihood $4.8 billion figure as much more strongly evidenced.

Cost of bankruptcy

Bankruptcy is a low-prevalence yet severe consequence of gambling harm and results in direct costs due to unpaid debts and administrative costs associated with filing for bankruptcy. The approach taken in this costing differs to that used in the previous Victorian costing (Browne et al. 2017b). The previous study used self-report data to calculate the prevalence of bankruptcies due to gambling. In this updated costing, we use an improved approach using government sources. Specifically, the following estimates were used for our calculations:

- Number of bankruptcies due to gambling
  - The most recent data from the Australian Government (2023) indicates that, in 2016–17, 404 people entered a non-business-related bankruptcy for the reported combined reason 'due to gambling, speculation and extravagance in living'. There were also 52 business-related bankruptcies due to the combined reason 'gambling or speculation'. This total of 456 bankruptcies due to gambling when portioned out to the Victorian population (ABS 2023c) equates to 114 bankruptcies.
  - More recent figures relating to bankruptcies due to gambling could not be sourced despite requests to the relevant government authority. Nonetheless, there is confidence in this figure of 114 because historical data trends similarly (for example, 118 bankruptcies in 2015–16; Australian Government 2023).
- Cost (per case) to administer bankruptcies
  - Administration costs of $4,000 per bankruptcy were sourced from the Australian Financial Security Authority (2023a).
- Average unpaid debt per person who gambles
  - No recent figures of the average debt per person who gambles were available, therefore, the VCEC (2012) figure of $20,419 was inflated, resulting in the average unpaid debt of $27,450 per gambler.

Table 13 shows the **total estimated cost of bankruptcy due to gambling in Victoria was $3.6 million**, with $3.1 million of this being due to unpaid debts. The total cost is much lower than the adjusted $106.3 million since 2014, which is due to the much more conservative approach taken in this updated costing. Calculating the cost of bankruptcies is an inherent challenge within gambling costing studies (VCEC 2012), with some Australian costing studies entirely excluding this as a line item due to the difficulty associated with estimation (Whetton et al. 2018).

Given the uncertainty around low-prevalence self-reported data we opted for the conservative approach of using government records. We also calculated upper and lower bounds. The lower bound was calculated by adjusting the number of bankruptcies. In 2016–17 the total number of bankruptcies were 16,158 compared with 5,765 in 2022–23 (Australian Financial Security Authority 2023b). This reduced rate was applied to the figure of 114 bankruptcies, equating to 40 bankruptcies due to gambling and resulting in a lower bound of $1.3 million. The upper bound was calculated by increasing the unpaid debt per person who gambles to the adjusted median level of debt in Australia (Ali et al. 2016), which resulted in a figure of $50,771. Accordingly, the upper bound for bankruptcy due to gambling was set at $6.2 million.

Table 13: Cost of bankruptcy due to gambling problems in Victoria (2022–23)

Variable	Calculation	Total
Number of bankruptcies in Victorian population due to gambling	a	114
		Administration cost
Administration cost per bankruptcy	b	$4,000
Total administration cost	c = a × b	$456,000
		Unpaid debt
Unpaid debt per gambler	d	$27,450
Total unpaid debts	e = a × d	$3,129,294
Total cost per bankruptcy	**c + e**	**$3,585,294**
Lower bound estimate		$1,257,998
Upper bound estimate		$6,243,894

Cost of illegal offshore wagering

Illegal offshore wagering is a cost due to funds being sent overseas instead of contributing to the Australian economy via taxes, levies, employment and ancillary services from legalised wagering activities. The prior Victorian costing (Browne et al. 2017b) relied on figures from the Productivity Commission (2010) and estimated the cost of the unofficial sector at $215.6 million.

Since the previous costing, more recent research undertaken by H2 (2023) forms the basis of our updated calculations (Table 14). In 2022 the Australian offshore wagering market was estimated at $1.1 billion. After inflating this, and adjusting to the Victorian population, the **total estimated cost of illegal offshore wagering in Victoria was $305.4 million**.

Table 14: Total cost of illegal offshore wagering in Victoria (2022–23)

Variable	Calculation	Total
Grey market wagering	a	$571,000,000
Black market wagering	b	$560,000,000
Total cost of illegal wagering	c = a + b	$1,131,000,000
Inflated to 2022/23	d	$1,194,302,239
Victorian proportion of Australia	e	25.6%
Total cost of illegal offshore wagering	**f = d × e**	**$305,429,510**
Lower bound estimate		$305,429,510
Upper bound estimate		$323,244,838

By way of comparison, the inflation and population adjusted figure from the previous Victorian costing today would result in a cost of $323.2 million; this forms our upper bound for this item. We rely on the H2 (2023) figures in this costing due to its recency and comprehensiveness and, therefore, this source informs our lower bound.

2.2.4 Emotional and psychological harm to the person who gambles

Emotional and psychological impacts are a major harm domain (Langham et al. 2016). These represent mostly intangible costs and comprise a significant component of the total costing. The 2023 Victorian study includes the costs of:

- depression due to gambling
- suicide attempts due to gambling
- general HRQoL decrements due to gambling.

This section only includes costs associated with the person who gambles. Emotional and psychological harms for affected others are costed in section 2.2.5 ‘Relationships and family’.

Depression

Gambling problems have consistently been associated with symptoms of depression. For example, a systematic review of population studies found that 37.9% of people classified as problem or pathological gamblers had a type of mood disorder (Lorains et al. 2011). In a similar analysis examining treatment-seeking problem gamblers only, around 23.1% had a current mood disorder (Dowling et al. 2015). But bi-directional causality has been established, where gambling harm can lead to lowered mood and, alternatively, gambling can be used as an escape or coping mechanism for low mood (Dowling et al. 2019; Dussault et al. 2011; Wood and Griffiths 2007).

Apart from the psychological burden, there can be significant out-of-pocket costs associated with symptoms of depression. The Productivity Commission report into mental health in Australia (2020) identified ‘sizeable out-of-pocket costs when accessing treatment’. These costs were valued at $700 million for people with mental health issues.

The overall approach used to cost depression in this study is similar to that used in the 2017 Victorian costing (Browne et al. 2017b). But, given the substantial out-of-pocket costs associated with depression, an estimate for these is also included in the current costing. The following estimates were used for our calculations:

- Number of people reporting increases in depression due to gambling
  - The percentage of people who reported experiencing an increase in depression due to their gambling within the previous 12 months (Browne et al. 2022) was multiplied by the estimated number of people who gamble across each PGSI category (VPGHS).
  - The number of people who had experienced an increase in depression due to gambling was reduced by the 20% causality discount as per the Productivity Commission (1999).
  - The resulting number of people was multiplied by 45.1% to account for the proportion that was likely to result in professional treatment (ABS 2023d).
- Cost of emotional distress
  - A cost of $9,180 (VOCAT 2023) was used as an emotional distress proxy in the cost calculation of depression due to gambling.
- Out-of-pocket costs
  - Out-of-pocket costs were sourced from McIntyre et al. (2021). An average out-of-pocket cost of $818 was included, which represented the average out-of-pocket costs associated with pharmaceuticals and professional medical advice (from a general practitioner, counsellor, psychologist or psychiatrist).

Table 15 shows **the total estimated cost of depression associated with people who gamble in Victoria is almost $200 million**. The figure is slightly lower than 2014 (Browne et al. 2017b), which was around $265 million (adjusted). This minor decrease is due, in part, to our decision to apply a more conservative approach than the original costing by incorporating a causality discount of 20%.

Table 15: Cost of depression due to gambling problems in Victoria (2022–23)

Variable	Calculation	Low-risk	Moderate-risk	Problem gambling	Total
Victorian population by PGSI (*n*)	a	276,023	117,784	48,183	441,990
Rate (%) of PGSI group who experienced increase in depression due to gambling	b	3.0%	17.4%	55.2%	–
Number experiencing increase in depression due to gambling, less 20% causality discount	c = (a × b) x 80%	6,641	16,350	21,267	44,258
Total number of PGSI group receiving treatment for depression due to gambling	d = c × 45.1%	2,995	7,374	9,591	19,960
Emotional distress					
Cost of emotional distress for depression	e	$9,180			–
Total emotional distress costs for depression	f = d × e	$27,495,577	$67,691,633	$88,049,122	$183,236,332
Out-of-pocket costs					
Average annual out-of-pocket costs	g	$818			–
Total out-of-pocket costs	h = d × g	$2,450,281	$6,032,372	$7,846,539	$16,329,192
Total cost	f + h	$29,945,858	$73,724,005	$95,895,661	$199,565,524
Total cost of depression due to gambling problems					**$199,565,524**
Lower bound estimate					$189,587,247
Upper bound estimate					$794,265,227

The results indicate that around 0.85% of all Victorians were reported to have experienced an increase in depression due to gambling, and, for the costing, it was estimated that just under half of these (0.38%; equivalent to around 20,000 Victorians) had experienced this to the extent that they had sought professional help.

Overall, this study has taken a conservative approach to costing depression. The number of people reporting increased symptoms of depression is consistent with other literature (Dowling et al. 2015; Lorains et al. 2011), and this has been discounted further to allow for attribution uncertainty and treatment-seeking. The costs allocated to emotional distress also appear

relatively conservative. The Northern Territory costing used a low value of $3,146 and an upper value of $20,559 (Whetton et al. 2018). In 2021 the cost of gambling in Tasmania used a low value of $12,864 and a high value of $81,917 for severe depression (SACES et al. 2021).

Taking this into consideration, and given the conservative nature of the base estimate, to calculate a lower bound for the costing, the study used a simple 5% reduction of all costs. This approach was taken to account for any random sampling error in the prevalence data. For the upper bound, we used the health decrement associated with major depressive disorder – moderate severity (0.40) identified by the HRQoL decrement in the Global Burden of Disease Disability Weights (Global Burden of Disease Collaborative Network 2020). This level of decrement is described as a person having constant sadness, difficulty in daily life, sleeping badly and having trouble concentrating (Global Burden of Disease Collaborative Network 2020). Therefore, it was deemed to adequately reflect a level of severity of depression associated with seeking professional help. The health decrement was linked to the cost associated with YLD ($97,435; ABS 2023a), which resulted in an upper bound cost proxy for emotional distress due to depression of $38,974.

Using these upper and lower bounds, the estimated cost of depression associated with Victorians who gamble is between a lower bound of $190 million and an upper bound $794 million. This wide range is mostly due to a lack of consensus in the literature on the appropriate value to place on the impact of depression.

Suicide attempts

People with gambling problems are highly vulnerable to suicidal ideation, with gambling problems contributing to 2 major risk factors – financial hardship and relationship problems (Suicide Prevention Australia and Financial Counselling Australia 2022). In a UK population study, 19.2% of people who were classified as problem gamblers reported thoughts about suicide in the past year and 4.7% had made a suicide attempt (Wardle et al. 2019). At a major Victorian hospital, 17.2% of people seen by the Psychiatric Triage Team had gambling problems (De Castella et al. 2011). Of those with gambling problems who consented to in-depth interviews, 19% scored high on a suicide intent scale.

The 2022–23 costing used broadly the same approach as used in the prior Victorian costing (Browne et al. 2017b), using updated data sources where available. But, unlike the previous study, the current report only calculates costs associated with suicide attempts, rather than both suicide attempts and ideation. This change in approach was due to a more comprehensive measure of HRQoL impact, as well as costs associated with depression. Suicidal ideation is highly comorbid with these cost areas; therefore, it was excluded to reduce the risk of double counting.

There are no recent Australian gambling studies that have asked about attempted suicides, so this costing used the same source as the previous costing – ‘The Victorian gambling-related harms study’ (Browne et al. 2016) national survey dataset. The following estimates were used for our calculations:

- Number of people reporting suicidal attempts due to gambling
  - The percentage of people whose gambling led them to attempt suicide within a 12-month period (Browne et al. 2016) was multiplied by the estimated number of people across each PGSI category (VPGHS).
  - The number of people who had experienced a suicide attempt due to gambling was reduced by the 20% causality discount as per the Productivity Commission (1999). Also, we examined the previous economic costing for any potential anticonservative tendencies in the estimates and decided to exclude (discount by 100%) the suicide attempts reported by people categorised as low-risk gambling. Suicidal attempts are less common in lower risk gamblers (Wardle et al. 2019), and in those cases gambling

problems are unlikely to be the dominant trigger. Therefore, for those people experiencing less severe gambling problems there are likely to be attribution issues that cannot be appropriately accounted for.
  - The number of fatalities by suicide due to gambling problems (refer to 'Cost of fatality by suicide to the Victorian economy' in section 2.2.7 for details) was subtracted from the total to avoid double counting.
- Cost of emotional distress
  - A cost of $9,180 (VOCAT 2023) was used as an emotional distress proxy in the cost calculation of suicide attempts due to gambling.

The total estimated cost of suicide attempts due to gambling in Victoria is approximately $32 million (Table 16). This represents a decrease from around $100 million (adjusted) since 2014 (Browne et al. 2017b). This is due almost exclusively to the more conservative approach taken in excluding people classified as low-risk gamblers. The previous costing also includes almost $333 million (adjusted) for suicidal ideation, which, as discussed, was not costed as a separate item for the current study.

Table 16: Cost of suicide attempts due to gambling problems in Victoria (2022–23)

Variable	Calculation	Low-risk	Moderate-risk	Problem gambling	Total
Victorian population by PGSI (*n*)	a	276,023	117,784	48,183	441,990
Rate (%) of PGSI group whose gambling led them to attempt suicide (12 month period)	b	1.9%	0.7%	7.5%	–
Reported suicide attempts attributable to gambling, less 20% causality discount	c = (a × b) × 80%	–	682	2,873	3,555
Less number of fatalities by suicide	d	–	6	27	34
Number of suicide attempts attributable to gambling	e = c – d	–	676	2,846	3,522
Cost of emotional distress for suicide attempts	f	$9,180			–
Total cost	g = e × f	$0	$6,201,356	$26,128,106	$32,329,463
Total cost of suicide attempts due to gambling problems					**$32,329,463**
Lower bound estimate					$30,712,990
Upper bound estimate					$226,472,113

Overall, the study has taken a conservative approach to costing suicide attempts. After the causality reduction, the study found almost 6% of people classified as problem gamblers have attempted suicide due to their gambling within a 12-month period. This is consistent with that found in the UK population study (Wardle et al. 2019). Overall, the data indicates that around

0.13% of all people who gamble have attempted suicide due to their gambling. As discussed in relation to depression, the costs allocated to emotional distress also appear to be particularly conservative, with other economic costings using values up to $81,917 for conditions that include thoughts of suicide (as opposed to suicide attempts) (SACES et al. 2021).

Considering the uncertainly around the actual cost associated with the emotional impacts of suicide attempts, we used lower and upper bounds to provide a possible range of total cost. As a lower bound, the study used a simple 5% reduction of all costs to account for any potential sampling error. Using a similar approach to that used for depression, we identified the HRQoL decrements for major depressive disorder – severe, which is 0.66 (Global Burden of Disease Collaborative Network 2020) and linked that proportion to the cost associated with YLD ($97,435; ABS 2023a). The severe level of major depressive disorder is described as the individual experiencing a desire to harm or kill themself (Global Burden of Disease Collaborative Network 2020) and was therefore, deemed to be an appropriate proxy for this item. The figure of $64,307 was therefore used to cost the upper bound.

Using these upper and lower bounds, the estimated cost of suicide attempts associated with people who gamble in Victoria is between a lower bound of $31 million and an upper bound of $226 million. This wide range is mostly due to a lack of consensus in the literature on the appropriate value to place on the impact of suicide attempts.

Cost of HRQoL impact of gambling harm on the gambler – emotional and psychological harm

The impact of gambling harm on the health and wellbeing of people who gamble and affected others are key areas of cost. As described in the methodology section (refer to ‘Costing HRQoL impact’ and ‘Valuing HRQoL impacts in financial terms’ in section 2.1.3 for details), the current costing used an updated method to cost HRQoL decrements. This method used direct and indirect elicitation approaches to determine HRQoL decrements associated with gambling harm. As described in section 2.1.3, the process involved identifying existing research and using this to establish a scaling factor for the maximum health impact of severe gambling harm and a curve representing the slope from minimal to maximum harm levels. Direct methods, such as TTO and VAS, are best suited for estimating the scaling factor, while indirect (statistical) methods are more appropriate for identifying the HRQoL curve across different levels of gambling harm severity. This process resulted in identifying the HRQoL decrement associated with each score on the GHS-10, which were then used to calculate YLD and costed using a proxy value of GDP per capita (described below).

After identifying the total cost of HRQoL impacts, discounts were made to exclude any potentially double-counted areas of impact. As described in more detail in the prior costing (Browne et al. 2017b), the self-reported impacts measured by the GHS-10 are associated with 6 domains of harm. One of those domains is emotional and psychological harm. The rest comprise other domains of harm such as financial deprivation, relational harms, health, socially deviant consequences, or work and study. These are costed elsewhere in the current report. It was previously determined that 29.3% of disability weight variance could be linked to emotional and psychological harms and 15.9% to health-related harms (Browne et al. 2017b). Therefore, to avoid double counting, only this proportion (45.2%) of the total HRQoL impacts was included in the final costing. The following estimates were used:

- HRQoL decrements
  - The proportion of the adult population of Victoria who scored between 1 and 10 on the GHS-10 was used to calculate the relevant number of harmed people who gamble associated with each score (VPGHS).

  - This number was multiplied by the HRQoL decrement associated with each score on the GHS-10 to determine the total YLD. Refer to 'Costing HRQoL impact' in section 2.1.3 for details.
- Valuing YLD
  - The value of a YLD was costed using a proxy of GDP per capita ($97,435; ABS 2023a). Refer to 'Valuing HRQoL impacts in financial terms' in section 2.1.3 for details.
  - The total HRQoL cost of over $7 billion dollars represents the total impact of gambling-related harm to adults who gamble in Victoria.
  - This amount was multiplied by 45.2% to account for only the emotional and psychological harm component of the GHS-10.
  - The psychological costs associated with depression due to gambling problems was subtracted from the total to avoid double counting.

The total estimated cost of HRQoL impacts due to gambling in Victoria is approximately $3.0 billion (Table 17). This is significantly higher than the previous figure of $1.7 billion (adjusted). This difference can be linked to an increase in the cost proxy used since the previous study and a difference in the composition of harmed people who gamble. To confirm the difference was not due to the change of harm measure, the study applied the same methodology to the PGSI (the measure used in the previous costing). We used the HRQoL decrements identified by Browne et al. (2016) for low-risk (0.13), moderate-risk (0.29) and problem gambling (0.44). This resulted in a total of 91,240 YLD and an estimated cost (after exclusions) of $3.8 billion. The GHS-10-based figure therefore yields a similar but somewhat lower costing estimate than the previous method based on the PGSI.

To identify lower and upper bounds and provide a possible range of total cost, the approaches applied in prior costing studies were reviewed. Prior costing applied HRQoL proxy costs ranging from $47,302 to $309,157 (SACES et al. 2021; Productivity Commission 2020; Whetton et al. 2018). Another commonly used method is to use a proportion of GDP per capita to represent high and low bounds. The World Health Organization recommends using 1 to 3 times GDP per capita (Robinson et al. 2017). This method was used in a recent study costing the global burden of mental health disorders (Arias et al. 2022). But, following a systematic review, Lino et al. (2022) recommends using 0.5 to 1.5 times GDP per capita as low/high valuations. Using this more conservative approach results in a lower bound HRQoL proxy of $48,718 and an upper bound of $146,153. Therefore, the valuation range of the cost of HRQoL impacts due to gambling in Victoria, according to our current estimates, is between $1.4 billion and $4.7 billion. This uncertainty is attributable to the lack of consensus in precedent costings, deriving in turn from (a perhaps understandable) lack of philosophical agreement on how to value the worth of a human life in financial terms.

Table 17: Cost of HRQoL impacts of gambling harm on the gambler in Victoria (2022–23)

Variable	Calculation	GHS-10 score										Total
		1	2	3	4	5	6	7	8	9	10	
Victorian population	a	5,193,289										–
Proportion of adult Victorian population	b	3.14%	1.46%	0.84%	0.47%	0.24%	0.22%	0.34%	0.19%	0.12%	0.07%	–
Number of harmed people who gamble	c = a × b	163,069	75,822	43,416	24,616	12,412	11,269	17,553	9,815	6,024	3,864	367,861
HRQoL decrement associated with GHS-10	d	0.10	0.19	0.26	0.31	0.35	0.37	0.38	0.41	0.43	0.45	–
Total years lived with a disability (YLD)	e = c × d	16,307	14,406	11,288	7,631	4,344	4,170	6,670	4,024	2,590	1,739	73,170
Cost associated with each YLD	f	$97,435										–
Total HRQoL	g = e × f	$1.59 B	$1.40 B	$1.10 B	$743.53 M	$423.28 M	$406.27 M	$649.92 M	$392.41 M	$252.40 M	$169.41 M	$7,129,300,117
Discount to exclude proportion of harm attributable to financial deprivation, relationships, socially deviate consequential behaviour, and work or study issues												$3,222,443,653
Less costs associated with the emotional distress associated with depression												$183,236,332
Total cost HRQoL impact of gambling harm on the gambler												**$3,039,207,321**
Lower bound estimate												$1,427,985,494
Upper bound estimate												$4,650,429,147

Note. In this table, 'B' refers to billions of dollars and 'M' to millions of dollars. Total HRQoL costs by GHS-10 score have been rounded to 2 decimal places.

2.2.5 Relationships and family

Relationship harms and harms to others is an important harm domain associated with gambling problems. These are commonly reported by both people who gamble and those close to them (Hing et al. 2022; Langham et al. 2016). The bulk of the costs in this domain are intangible, relating to emotional distress. The current costing quantifies the costs of:

- divorce and separation to the person who gambles and affected others
- experiences of violence to the person who gambles and affected others
- suicide attempts and fatality by suicide to affected others
- general HRQoL decrements to affected others.

Cost of divorce and separation

Relationship breakdowns are commonly associated with gambling problems. The Productivity Commission (2010) reported that 15.5% of people classified as problem gamblers reported that gambling problems contributed to the breakup of an important relationship, compared with 2.4% and 2.2% for low- and moderate-risk gambling, respectively. One study examining partners of people with gambling problems found that almost all (86%) had contemplated leaving the relationship, and 29% had left the relationship (Lorenz and Yaffee 1988).

The costs associated with divorce and separation were estimated in 3 sections:

- the financial cost associated with divorce or separation
- emotional distress to the person who gambles
- emotional distress to the affected family members.

The 2022–23 costing used the same approach as used in the prior Victorian costing (Browne et al. 2017b), using updated data sources where available. The following estimates were used for our calculations:

- Number of people impacted by separation or divorce due to gambling
  - The percentage of people who experienced separation or divorce due to their gambling was sourced from the 'Victorian gambling-related harms study' (Browne et al. 2016) national survey dataset. This was the same source as used in the previous costing because no more recent Australian gambling studies that asked about this issue could be identified.
  - The number of people who had experienced separation or divorce due to their gambling was reduced by the 20% causality discount as per the Productivity Commission (Productivity Commission 1999).
  - The number of affected others was calculated by the average number of people in an Australian household (2.5 people) (Australian Institute of Family Studies 2023) minus the person who gambles.
- Financial cost of divorce or separation
  - To calculate the number of people who are likely to incur financial costs associated with a relationship breakdown, the number of people reporting a separation or divorce due to their gambling was multiplied by 58%, which represents the proportion of Australian adults who are married or cohabiting (Baxter and Warren 2021).
  - The average cost of court and legal fees for a simple divorce (with no custody or property issues) is $2,107, which includes $1,060 for the court fees payable for an application to divorce (Federal Circuit and Family Court of Australia 2023) and typical cost for legal fees ($930) (Pearsons Lawyers 2021) inflated to 2023 prices: $1,047.

- Cost of emotional distress
  - A cost of $9,180 (VOCAT 2023) was used as an emotional distress proxy in the cost calculation of separation or divorce due to gambling.

Table 18 shows **the estimated cost associated with divorce and separation due to gambling to be around $358 million**. This represents a significant decrease since the previous costing due to a much more conservative approach to identifying impacted affected others, resulting in a substantially lower number of affected others included.

After the causality reduction, the number of people classified as problem gamblers whose gambling had contributed to or caused a relationship breakdown (15.6%) is consistent with that found in the Productivity Commission (2010), as are those classified as low- and moderate-risk gamblers (1.5% and 2.6% respectively). In allocating costs to these harms, not all people reporting a divorce or separation will incur legal expenses. But the cost of legal fees in this study relate to very simple divorces. For example, in cases where children are involved, even straightforward cases can incur legal costs in excess of an extra $6,000 (Pearsons Lawyers 2021). As used in the previous Victorian costing, this study uses the average amount of financial assistance provided to victims of crime ($9,180) (VOCAT 2023) as a proxy for emotional and psychological distress. This is approximately equivalent to the lower bound used for the recent Tasmanian costing (SACES et al. 2021). The Tasmanian costing uses a higher per person cost of $29,491 for relationship breakdown.

Taking this into consideration, the current costing appears to represent a relatively conservative estimate of the costs. Therefore, as a lower bound, the study used a simple 5% reduction of all costs to account for any random sampling error in the prevalence data. For the upper bound, the value of emotional distress was doubled to $18,360 because this figure is more in line with that used in the Tasmanian costing and is likely to represent distress associated with a relationship breakdown. Therefore, the estimated cost of divorce and separation associated with gambling in Victoria is between a lower bound of $322 million and an upper bound of $552 million. Again, the wide range is due to a lack of consensus in the literature in valuing the impact of intangible items such as psychological harm.

Table 18: Cost of divorce and separation due to gambling problems in Victoria (2022–23)

Variable	Calculation	Low-risk	Moderate-risk	Problem gambling	Total
Victorian population by PGSI (*n*)	a	276,023	117,784	48,183	441,990
Percentage that gambling contributed to or caused divorce or separation	b	1.9%	3.3%	19.5%	–
Number who experience divorce or separation due to gambling, less 20% causality discount	c = (a × b) x 80%	4,196	3,109	7,517	14,822
Financial cost of divorce or separation					
Filing and legal fees	d	$2,107			–
Total financial cost of divorce	e = (c × 58%) × d	$5,127,213	$3,799,993	$9,185,673	$18,112,879
Emotional distress to the gambler					
Cost of emotional distress	f	$9,180			–
Total cost of emotional distress to the person who gambles	g = c × f	$38,515,145	$28,545,188	$69,001,911	$136,062,244
Emotional distress to affected others					
Average number of people per household (minus the gambler)	h	1.5			–
Number of affected others	i = h × c	6,293	4,664	11,275	22,232
Cost of emotional distress	j	$9,180			–
Total cost of emotional distress to affected others	k = i × j	$57,772,718	$42,817,782	$103,502,866	$204,093,366
Total cost of divorce and separation	l = e + g + k	$101,415,077	$75,162,963	$181,690,449	**$358,268,488**
Lower bound estimate					$322,441,640
Upper bound estimate					$552,103,450

Cost of experience of violence

There is a strong association between gambling problems and family and interpersonal violence, with people experiencing gambling problems being at increased risk of being both perpetrator and victim (Dowling et al. 2016, 2018; Suomi et al. 2018). For example, an Australian population study found people with serious gambling problems (moderate-risk or problem gambling) were at increased risk of being a victim (2.73 times) and perpetrator (2.56 times) of family violence compared with non-problem gamblers (Dowling et al. 2018). Even people gambling at low risk levels had a twofold increase in experiencing violence (perpetrator and victim).

The emotional costs associated with experiences of violence related to gambling problems were estimated in 2 sections:

- emotional distress to the person who gambles
- emotional distress to affected others.

In quantifying the emotional cost associated with experiences of violence, the current costing used roughly the same approach as used in the prior Victorian costing (Browne et al. 2017b). But, in the prior Victorian costing, impact to affected others, in the absence of more accurate data, was calculated using the average size of households minus the gambler. A significant enhancement for the current costing is that the 2023 VPGHS contained items that directly asked affected others about their experience of violence, and this was used in the current costing.

The following estimates were used for our calculations:

Emotional distress to the person who gambles:

- Number of people impacted by violence due to gambling
  - The percentage of people who gamble whose gambling contributed to or caused experiences of violence (including family and domestic violence) within a 12-month period (VPGHS) was multiplied by the number of people who gamble across each PGSI category (VPGHS).
  - The number of people whose own gambling contributed to or caused experiences of violence due to gambling was reduced by the 20% causality discount as per the Productivity Commission (1999).
- Cost of emotional distress
  - A cost of $9,180 (VOCAT 2023) was used as an emotional distress proxy in the cost calculation of experiences of violence due to gambling.

Emotional distress to affected others:

- Number of people impacted by violence due to another person's gambling
  - The percentage of people who had been a victim of family or domestic violence within the previous 12 months due to another person's gambling (VPGHS) was multiplied by the total number of people who reported being harmed by another person's gambling (VPGHS).
  - The number of people for whom another person's gambling contributed to or caused experiences of violence was reduced by the 20% causality discount as per the Productivity Commission (Productivity Commission 1999).
- Cost of emotional distress
  - A cost of $9,180 (VOCAT 2023) was used as an emotional distress proxy in the cost calculation of experiences of violence due to gambling.

Table 19 shows **the estimated cost of experiences of violence due to gambling in Victoria. The total cost is estimated at approximately $350 million**. This represents an increase from around $182 million (adjusted) since 2014 (Browne et al. 2017b).

Table 19: Cost of experiences of violence due to gambling problems in Victoria (2022–23)

Variable	Calculation	Low-risk	Moderate-risk	Problem gambling	Total
Victorian population by PGSI (*n*)	a	276,023	117,784	48,183	441,990
Emotional distress to the gambler					
Percentage gambling contributed to or caused experiences of violence (including family and domestic violence)	b	1.1%	6.0%	13.0%	–
Number of people who gamble who experience violence due to gambling, less 20% causality discount	c = (a × b) x 80%	2,336	5,664	5,021	13,020
Cost of emotional distress	d	$9,180			–
Total cost of emotional distress to the person who gambles	e = c × d	$21,440,290	$51,992,001	$46,091,901	$119,524,192
Emotional distress to affected other					
Number of affected others harmed	f				216,041
Percentage gambling contributed to or caused experiences of violence (including family and domestic violence)	g				14.5%
less 20% attribution discount	h = (f × g) x 80%				25,061
Cost of emotional distress	i				$9,180
Total cost of emotional distress to affected others	j = h × i				$230,057,551
Total cost	e + j				$349,581,743
Total cost of experiences of violence					**$349,581,743**
Lower bound estimate					$332,102,656
Upper bound estimate					$367,060,830

This increase is due to several factors. The change of methodology in identifying affected others with experience of violence, from very conservative (size of household) to prevalence data (VPGHS), resulted in a significant change in the number of affected others. Also, there was also an increase in the proportion of people who gamble reporting experiences of violence since the last survey (an increase from 9.9% of problem gamblers to 13.0% of problem gamblers). This increase may be due to an actual increase in violence or the use of more representative data. Nonetheless, the proportion of people who gamble reporting experiences with violence is lower than found in other literature, where at least a third of problem gamblers report experiences with violence within the previous 12 months (Dowling et al. 2018, 2016; Suomi et al. 2018). The lower proportion in this study may be due to a reluctance to disclose this information. The proportion of violence due to gambling problems reported by affected others was similar to that reported by problem gamblers.

Taking this into consideration and given a conservative proxy for emotional and psychological distress was used, this appears to be a fairly accurate representation of the costs without major sources of uncertainty. Therefore, a nominal 5% confidence interval to account for potential sampling error in the prevalence study was used to provide upper and lower bounds. This approach results in the estimated cost of violence associated with gambling in Victoria of between a lower bound of $332 million and an upper bound $367 million. Note that this cost accounts only for the emotional and psychological costs associated with experiences of violence and should not be taken to represent the total cost of violence linked to gambling, which could include other components such as hospital visits.

Cost of suicide attempts and fatality by suicide to affected others

Suicide attempts and fatalities have significant impacts on people exposed to them. But there is no established method to accurately determine the number of people impacted by each suicide attempt or fatality, nor the extent of the impact to those affected (Cerel et al. 2019; Maple et al. 2016).

Cerel et al. (2014) proposed a ‘continuum of survivorship’, which is a nested model of impact to others. There are those who are *exposed* to another person’s suicide (know of someone, but not necessarily impacted), *affected* by another person’s suicide (those who feel a level of psychological distress associated with the situation) and those who experience short- and long-term *bereavement* such as partners, family members and close friends and colleagues.

Many people are exposed to suicide. An Australian study found 85% of survey respondents knew someone who had died by suicide, most commonly a friend (Maple et al. 2016). Recently Cerel et al. (2019) found that 135 Americans are exposed to each fatality by suicide.

For more than 50 years, a widely accepted estimate has suggested that 6 people are bereaved or impacted by each suicide death (Berman 2011; Cerel et al. 2019; Maple et al. 2016). Attempts to quantify this number have resulted in higher estimates ranging from 10 to 115 (Berman 2011). Berman (2011) identified that the number of affected others who had previously had daily contact with the deceased ranged between 4 and 17 affected others, and weekly contact between 14 and 30. Overall, Berman (2011) found that the original estimate of 6 people impacted appeared to approximately represent the number of people in the close family.

The costs associated with the impacts on affected others of suicide attempts and fatality related to gambling problems were estimated in 2 sections:

- suicide attempts, impacts to affected others
- fatality by suicide, impacts to affected others.

Suicide attempts – impact on affected others

The current costing used a similar approach to the previous Victorian costing (Browne et al. 2017b). But as discussed in relation to people who gamble (refer to 'Suicide attempts' in section 2.2.4 for details) those categorised as low-risk gamblers were excluded due to attribution issues. The following estimates were used for our calculations:

- Number of people impacted by suicide attempts
  - The total number of suicide attempts linked to gambling (after 20% causality discount and not including fatalities by suicide) was taken from Table 16 (refer to section 2.2.4 for details).
  - This number was multiplied by 6, which represents the average number of other people affected by a suicide attempt.
- Cost of emotional distress
  - A cost of $9,180 (VOCAT 2023) was used as an emotional distress proxy in the cost calculation of the impact of suicide attempts on affected others due to gambling.

The estimated cost of the impact of suicide attempts due to gambling on affected others in Victoria is approximately $194 million (Table 20)**.** This represents a decrease from around $604 million since 2014 (Browne et al. 2017b), mostly due to the more conservative approach taken in this study to not include attempted suicides by those categorised as low-risk gamblers.

The current study used the same approach to the previous costing (Browne et al. 2017b) to identify the number of affected others impacted by another person's suicide attempts – 6 people. The Productivity Commission (1999) used a calculation equivalent to 2.3 people for every person who gambles who attempted suicide, whereas other estimates point to potentially higher numbers of people impacted (Berman 2011; Cerel et al. 2019; Maple et al. 2016). In relation to the cost associated with the impact of suicide attempts on affected others, as discussed in relation to suicide attempts on the person who gambles (refer to section 2.2.4 for details), the costs allocated to emotional distress appear very conservative.

Considering the uncertainly around some of the assumptions used in costing the emotional impacts of suicide attempts on affected others, we used lower and upper bounds to provide a possible range of total cost. As a lower bound, we followed the Productivity Commission's (1999) very conservative estimate and reduced the number of people impacted to 2.3. For the upper bound, for suicide attempts (versus fatalities by suicide) we continue to use an estimate of 2.3 people impacted. But caring for a person who has attempted suicide is associated with severe emotional distress and hypervigilance, as well as the many practical considerations related to assisting a person in this situation (Wayland et al. 2021). Therefore, the HRQoL decrement associated with severe anxiety ('feels anxious and worried, which makes it difficult to concentrate, remember things and sleep'; Global Burden of Disease Collaborative Network 2020) was used as an upper bound proxy. This figure appears to be a slightly better representation of the psychological distress associated with caring for someone who is experiencing suicidal attempts. This HRQoL decrement (0.52) was linked to the cost associated with YLD ($97,435; ABS 2023a) and resulted in a cost proxy of $50,666.

Therefore, the estimated cost for emotional distress from the attempted suicide of people who gamble to affected others in Victoria is between a lower bound of $74 million and an upper bound of $410 million. The wide range is due to a lack of consensus in the literature in valuing the impact of intangible items, such as psychological harm.

Table 20: Cost of suicide attempts due to gambling problems in Victoria (2022–23)

Variable	Calculation	Low-risk	Moderate-risk	Problem gambling	Total
Total number of suicide attempts attributable to gambling	a	0	676	2,846	3,522
Average number of other people impacted by attempts of suicide	b	0	6	6	–
Number of affected others by the person who gambles and attempted suicide	c = a × b	0	4,053	17,077	21,130
Cost of emotional distress of affected others by the person who gamble's suicide attempts	d	$9,180			–
Total emotional and psychological cost of suicide attempts on the affected other	c × d	$0	$37,208,139	$156,768,638	$193,976,777
Total emotional and psychological cost of suicide attempts on the affected other					**$193,976,777**
Lower bound estimate					$74,357,765
Upper bound estimate					$410,393,300

Fatality by suicide – impact on affected others

The methodology used to identify the number of fatalities by suicide linked to gambling problems in Victoria has changed since the previous costing. Refer to 'Cost of fatality by suicide to the Victorian economy' in section 2.2.7 for details.

There is also an update on methodology in terms of placing a value on the impact of suicide attempts on affected others. Dependent partners and children might be expected to experience significant personal cost associated with grief, loss and trauma (Cerel et al. 2014) in addition to other factors such as financial and practical impacts (Lancaster and Johnson 2020; Maple et al. 2016). Therefore, the current costing attributes a larger cost for dependent partners and children than other affected people.

The following estimates were used for our calculations:

- Number of dependent partners and children impacted by suicide attempts
  - The total number of fatalities by suicide was taken from Table 31.
  - This number was multiplied by 54.2%, which was the proportion of people who were moderate-risk or problem gambling who were living with a spouse or children (VPGHS).

- Cost associated with dependent partners and children
  - A cost of $713,780 was used as a cost proxy in the calculation of fatalities by suicide due to gambling. This represents the WorkSafe Victoria lump sum payment for dependent partners and/or children of a worker who had died as a result of a work-related injury or illness (WorkSafe Victoria 2023).
- Number of other people impacted by suicide attempts
  - The total number of fatalities by suicide (taken from Table 31) was multiple by 6, which represents the average number of other people significantly affected by a suicide attempt (Berman 2011; Maple et al. 2016).
  - Less the number of dependent partners/children previously costed.
- Cost of emotional distress to other affected others
  - A cost of $9,180 (VOCAT 2023) was used as an emotional distress proxy for other affected others in the cost calculation of suicide deaths due to gambling.

Table 21 shows the estimated cost of the impact of fatality by suicide due to gambling on affected others in Victoria. **The total cost of impact to both dependent partners/children and close others is estimated at $15 million**. This figure represents a decrease from over $40 million in 2014 (Browne et al. 2017b), mostly due to the change of methodology and a more conservative estimate of deaths linked to suicide.

Table 21: Cost of the impact of fatality by suicide due to gambling problems in Victoria to affected others (2022–23)

Variable	Calculation	Total
Number of suicide fatalities attributable to gambling	a	34
Impact to dependent partners and children		
Proportion of moderate-risk or problem gamblers with dependent partners/children in the household	b	54.2%
Number of dependent partners/children	c = a × b	18
Cost proxy for dependent family by fatality by suicide	d	$713,780
Total cost for fatality by suicide on dependent partners/children	e = c × d	$13,015,039
Impact to close others		
Average number of other people impacted by suicide	f	6
Number of affected others by fatality by suicide (less dependent partners and children)	g = (a × f) – c	184
Cost of emotional distress of affected others by fatality by suicide	h	$9,180
Total cost for fatality by suicide on close others	i = g × h	$1,685,614
Total cost of the impact of fatality by suicide	j = e + i	**$14,700,652**
Lower bound estimate		$14,700,652
Upper bound estimate		$29,192,660

This cost represents a very conservative estimate of the impact of fatalities by suicide on affected others, both in relation to the number of suicides linked to gambling and the number of people impacted. Therefore, this figure will also represent the lower bound associated with the costing. To identify an upper bound, the number of suicides was increased to 6.2%, which is the average of the proportion found in Victoria (Rintoul et al. 2023) and Hong Kong (Wong et al. 2010); refer to discussion in section 2.2.7 for details. The number of close others impacted was also increased from 6 to 22, which represents the mean number of people who had at least weekly contact with the deceased (Berman 2011). This assumes that bereavement is experienced by people outside close family members, such as close friends, colleagues and associated professionals (doctors, psychologists).

The range of cost impact of the impact of fatality by suicide in Victoria to affected others is estimated to be between a lower bound of $15 million and an upper bound of $29 million. This range reflects the current lack of consensus in the literature about the exact number of people impacted by suicide as well as the level of harm they experience.

Cost of HRQoL impact of gambling harm on affected others – emotional and psychological harm

The impact of gambling harm on the health and wellbeing of affected others was costed using the same methodology as used for people who gamble (refer to section 2.2.4 for details). The following estimates were used for our calculations:

- HRQoL decrements
  - The proportion of the Victorians who scored between 1 and 10 on the GHS-10-AO was used to ascertain the relevant number of people reporting harm due to another person's gambling for each score (VPGHS).
  - This number was multiplied by the HRQoL decrement associated with each score on the GHS-10-AO to determine the total YLD. Refer to 'Costing HRQoL impact' in section 2.1.3 for details.
- Valuing YLD
  - The value of a YLD was costed using a proxy of GDP per capita ($97,435; ABS 2023a).
  - The total HRQoL cost of nearly $4 billion dollars represents the total impact of GRH experienced by affected others in Victoria.
  - This amount was multiplied by 45.2% to account for only the emotional, psychological and health-related harms.
  - The value of emotional distress associated with suicide attempts of the person who gambles was subtracted from the total to avoid double counting.

After harms costed elsewhere in the report were excluded, **the total estimated cost of HRQoL impacts on affected others due to another person's gambling in Victoria is around $1.6 billion** (Table 22). This is slightly higher than the previous figure of $1.3 billion (adjusted). This difference can be linked to a more accurate method of identifying harms to affected others. The previous costing had to rely on second-hand estimates of the number of people impacted from a non-representative sample. But the current study has access to a harm screen tailored to affected others (the GHS-10-AO) and directly administered in a population-representative study of Victorians. The data used in the current costing is therefore better.

The current study used the same methodology to identify lower and upper bounds as used with people who gamble (refer to section 2.2.4 for details). This resulted in a valuation range of the cost of HRQoL impacts on affected others due to another person's gambling in Victoria as between $708 million and $2.5 billion. This uncertainty range again reflects the lack of existing consensus in financially valuing a human life.

Table 22: Cost of HRQoL impacts of gambling harm on affected others in Victoria (2022–23)

Variable	Calculation	GHS-10-AO score										Total
		1	2	3	4	5	6	7	8	9	10	
Victorian population (*n*)	a	5,193,289										–
Proportion of adult population	b	0.59%	0.60%	0.54%	0.45%	0.40%	0.25%	0.35%	0.25%	0.11%	0.17%	–
Number of affected others	c = a × b	30,433	30,900	27,888	23,526	20,565	13,035	18,384	12,724	5,661	8,777	191,892
HRQoL decrement associated with GHS-10 – affected others	d	0.07	0.12	0.17	0.22	0.26	0.30	0.32	0.35	0.37	0.40	–
Total YLL	e = c × d	2,130.29	3,708.01	4,740.95	5,175.63	5,347.01	3,910.55	5,882.96	4,453.25	2,094.45	3,510.66	40,954
Cost associated with each YLL	f	$97,435										–
Total HRQoL	g = e × f	$207.6 M	$361.3 M	$461.9 M	$504.3 M	$521.0 M	$381.0 M	$573.2 M	$433.9 M	$204.1 M	$342.1 M	$3,990,329,384
Discount to exclude proportion of harm attributable to financial deprivation, relationships, socially deviate consequential behaviour, and work or study issues (h = g × 45.2%)												$1,803,628,882
Minus costs associated with emotional distress associated with suicide attempts of the person who gambles (i)												$193,976,777
Total cost HRQoL impact of gambling harm on affected others (j = h – i)												**$1,609,652,105**
Lower bound												$707,837,664
Upper bound												$2,511,466,545

Note. In this table, 'M' refers to millions of dollars. Total HRQoL costs by GHS-10-AO score have been rounded to one decimal place.

The current costing includes costs associated with a variety of impacts across relationships and affected others. But other costs are more challenging to place a value on. For example, the Productivity Commission report into mental health in Australia (2020) identified a cost of $15.3 billion for informal care by family and friends to those impacted by mental health issues. To our knowledge, there is no empirical evidence on the time spent by affected others on care for those impacted by gambling problems or their children and dependants. Similarly, affected others (and people who gamble) spend time travelling to and seeking help for gambling and associated problems, which could not be specially included. But some of this time is likely to be covered under the productivity and work/study loss section.

We also know that more than 10% of Australian children have a parent categorised as having a gambling problem, with between 0.9% and 1.6% classified as a problem gambler (Tulloch et al. 2022). They experience harm stemming primarily from financial and emotional neglect, which can have long-term effects into adulthood (Rockloff et al. 2022b; Suomi et al. 2023). But, despite this very real impact, evidence is not currently available to allow the study to identify an appropriate cost to place on impacts to HRQoL in children. More research should be conducted on these aspects so these costs can be included in future economic costings.

2.2.6 Crime-related costs to the justice system

Experiencing problems with gambling can result in criminal behaviour such as theft, fraud and other criminal activities (Browne et al. 2016; Langham et al. 2016; VCEC 2012). This behaviour can result in costs to the police system, courts and correctional facilities. The approach taken to estimate these costs generally followed the previous Victorian costing (Browne et al. 2017b), but some key differences were implemented. First, we applied a 20% causality discount to the prevalence of criminal behaviour in the interests of being conservative. A second addition was calculating the cost to the corrections system due to major fraud. Last, where more robust sources of evidence became available these were updated.

Calculating the cost of crime to the Victorian justice system included 5 components. The assumptions, approaches and sources for each of these components are outlined below.

Prevalence of criminal behaviour:

- Percentage of people who gamble reporting criminal behaviour due to gambling
  - This item examined criminal behaviour that could result in a police investigation, criminal charges or a conviction. Two items were sourced from a national survey of gambling-related harm (Browne et al. 2016). These 2 items included ‘feeling compelled or forced to commit a crime or steal’ and ‘petty theft or dishonesty’. After applying a 20% causality discount, these figures led to rates of 1.0%, 3.8% and 17.5% for low-risk, moderate-risk and problem gamblers, respectively.
- Representative figures for gambling problems among the Victorian population
  - These figures were sourced from the VPGHS. The discounted rates from Browne et al. (2016) were projected onto these representative figures. This resulted in 15,741 people who gamble who had engaged in criminal behaviour due to gambling (2,871 low-risk, 4,429 moderate-risk and 8,442 problem gamblers).

Police system:

- In line with the previous Victorian and other economic costings (Browne et al. 2017b; VCEC 2012), we assumed that 36.5% of crimes due to gambling will result in police investigation. This resulted in 5,745 people who gamble with police contact (1,048 low-risk, 1,616 moderate-risk and 3,081 problem gamblers).
  - During 2023 Victoria Police recorded 376,482 criminal incidents (Crime Statistics Agency 2023). This indicates that gambling-related police incidents accounted for 1.5% of all police incidents in Victoria. This is a conservative estimate, as independent research of police records has identified that 2.5% of deception offences were related to gambling (Perrone et al. 2011).
- The estimated cost per police incident was sourced from the Productivity Commission (2022a) and resulted in $682 after inflation.
- The cost of police system to Victorian justice system due to gambling problems was $3.9 million, as shown in Table 23.
- This cost excludes associated costs related to policing and community safety (for example, preventing robbery, theft and other crimes due to gambling) due to lack of appropriate data.

Table 23: Cost of police system to Victorian justice system due to gambling problems in Victoria (2022–23)

Variable	Calculation	Low-risk	Moderate-risk	Problem gambling	Total
Victorian population by PGSI	a	276,023	117,784	48,183	441,990
Criminal behaviour					
Rate (%) of PGSI group who engaged in criminal behaviour due to gambling, less 20% causality discount	b	1.0%	3.8%	17.5%	–
Police system					
Rate (%) of police investigations due to gambling	c = b × 36.5%	0.4%	1.4%	6.4%	–
Number of police investigations due to gambling	d = a × c	1,048	1,616	3,081	5,745
Cost per police incident	e	$682			
Total cost to the police system	**f = d × e**	**$714,588**	**$1,102,431**	**$2,101,383**	**$3,918,402**

Court system:

- In line with the previous Victorian and other economic costings (Browne et al. 2017b; VCEC 2012), we assumed that 86.3% of gambling-related crimes investigated by police will involve a court appearance. This resulted in 4,958 people who gamble appearing in court (904 low-risk, 1,395 moderate-risk and 2,659 problem gamblers).
  - In Victoria in 2022 there were 237,163 court cases recorded by the Productivity Commission (2022b). Together, these findings indicate that gambling-related court cases accounted for 2.1% of all court matters in Victoria. Comparatively, this figure is similar to research conducted in South Australia that randomly sampled court records and found 2.4% of records were gambling-related (Independent Gambling Authority 2007).
- The estimated cost per court case was inflated from the previous Victorian costing (Browne et al. 2017b) and resulted in $960.
- The cost of the court system to Victorian justice system due to gambling problems was $4.8 million as shown in Table 24.

Table 24: Cost of the court system to Victorian justice system due to gambling problems in Victoria (2022–23)

Variable	Calculation	Low-risk	Moderate-risk	Problem gambling	Total
Victorian population by PGSI	a	276,023	117,784	48,183	441,990
Criminal behaviour					
Rate (%) of PGSI group who engaged in criminal behaviour due to gambling	b	1.0%	3.8%	17.5%	–
Court system					
Rate (%) of police investigations due to gambling	c = b × 36.5%	0.4%	1.4%	6.4%	–
Rate (%) of court appearances due to gambling	d = c × 86.3%	0.3%	1.2%	5.5%	–
Number of court appearances due to gambling	e = a × d	904	1,395	2,659	4,958
Cost per court appearance	f	$960			
Total cost to the court system	**g = e × f**	**$868,068**	**$1,339,211**	**$2,552,718**	**$4,759,997**

Corrections system (theft):

- Previous costings (Browne et al. 2017b; VCEC 2012) have assumed that 40.5% of gambling-related court appearances will result in imprisonment. In the current study, we applied a more conservative assumption. This was based on data from the Sentencing Council of Victoria (2017), which reported the rate of imprisonment due to theft at 14.8%. Applying this lower assumed imprisonment rate resulted in an estimated 734 people who gamble being imprisoned due to theft (134 low-risk, 206 moderate-risk and 394 problem gamblers).
  - In 2023 there were 6,440 imprisonments in Victoria (ABS 2024b). This indicates that gambling-related imprisonments accounted for 11.4% of all imprisonments in Victoria. There is confidence in this figure because it accords, although is more conversative, with independent research conducted by Riley et al. (2015; 2018), who found that 18% to 20% of prisoners in South Australia reported that their sentence was related to gambling issues.
- Previous costings (Browne et al. 2017b; VCEC 2012) have also assumed a conservative average sentence length of 4 months. In the current study this average was updated based on information from the Sentencing Advisory Council (2022), which reported an average sentence length of 25 months for theft.
- The estimated cost per offender was sourced from the Productivity Commission (2022c) and resulted in $15,187 after inflation.
- The cost of the corrections system (theft) to the Victorian justice system due to gambling problems was $278.6 million, as shown in Table 25.

Corrections system cost (major fraud):

- To calculate the cost to the corrections system due to major fraud, information was extracted from Warfield (2016), who reviewed cases of gambling-motivated fraud. In Victoria there were reported to be 12.6 major fraud cases annually, with 73.0% of those cases resulting in an average custodial sentence of 14.9 months.
- The estimated cost per offender was sourced from the Productivity Commission (2022c) and resulted in $15,187 after inflation.
- The cost of the corrections system (major fraud) to the Victorian justice system due to gambling problems was $2 million.

Table 25: Cost of the corrections system (theft and major fraud) to the Victorian justice system due to gambling problems in Victoria (2022–23)

Variable	Calculation	Low-risk	Moderate-risk	Problem gambling	Total
Victorian population by PGSI	a	276,023	117,784	48,183	441,990
Rate (%) of PGSI group who engaged in criminal behaviour due to gambling, less 20% causality discount	b	1.0%	3.8%	17.5%	–
Rate (%) of police investigations due to gambling	c = b × 36.5%	0.4%	1.4%	6.4%	–
Rate (%) of court appearances due to gambling	d = c × 86.3%	0.3%	1.2%	5.5%	–
Corrections system (theft)					
Rate (%) of imprisonment due to gambling-related theft	e = d × 14.8%	0.05%	0.2%	0.8%	–
Number of imprisonments due to gambling-related theft	f = a × e	134	206	394	734
Average sentence (months)	g	25			
Cost per offender (per month)	h	$15,187			
Total cost to the corrections system due to gambling-related theft	**i = f × g × h**	**$50,811,832**	**$78,389,950**	**$149,421,875**	**$278,623,656**
Corrections system (major fraud)					
Number of cases of gambling-related major fraud	j	–	–	12.6	–
Rate of cases who received a custodial sentence	k	–	–	73.0%	–
Average sentence (months)	l	–	–	14.9	–
Total cost to the corrections system due to gambling-related major fraud	**m = (j × k) × l × h**	**–**	**–**	**$2,077,517**	**–**

Table 26 shows the **total estimated cost of crime to the Victorian justice system due to gambling in Victoria was $289.4 million**. Of this, $3.9 million was linked to the Victorian police system, $4.8 million to the Victorian court system and $280.7 million to the Victorian corrections system. This cost is higher that the adjusted $150.2 million from 2014, and this is due to:

- the increase in average sentencing length (from 4 months to 25 months)
- the incorporation of costs due to major fraud in the current study.

Table 26: Cost of crime to Victorian justice system due to gambling problems in Victoria (2022–23)

Variable	Calculation	Low-risk	Moderate-risk	Problem gambling	Total
Cost to the police system	a	$714,588	$1,102,431	$2,101,383	$3,918,402
Cost to the court system	b	$868,068	$1,339,211	$2,552,718	$4,759,997
Cost to the corrections system due to gambling-related theft	c	$50,811,832	$78,389,950	$149,421,875	$278,623,656
Cost to the corrections system due to gambling-related major fraud	d	–	–	$2,077,517	$2,077,517
Total	e = a + b + c + d	$52,394,488	$80,831,592	$156,153,492	$289,379,572
Total cost to the Victorian justice system					**$289,379,572**
Lower bound estimate					$289,379,572
Upper bound estimate					$516,703,618

Given the uncertainty around self-reported data, we identified upper and lower bounds. The current approach, consistent with the previous Victorian costing, relied on 2 items related to criminal behaviour. This appears to be a conservative approach and, therefore, forms our lower bound. To calculate the upper bound we modified the prevalence figure to include another 2 items: ‘arrested for unsafe driving’ and ‘took money or items from friends or family without asking first’. Based on the modified, less conservative approach of committing at least one of the 4 criminal behaviours, this resulted in rates of 1.9%, 6.6% and 31.5% for low-risk, moderate-risk and problem gamblers, respectively. Accordingly, the upper bound was calculated at $516.7 million.

2.2.7 Productivity loss and work/study impact costs

Cost of productivity loss

Productivity loss (or presenteeism) is a gambling harm that can be experienced due to tiredness or distraction caused by gambling (Browne et al. 2016). The approach taken to estimate this cost generally followed the previous Victorian costing (Browne et al. 2017b), but some key differences were implemented. First, the cost of productivity loss now includes the cost to affected others. New sources and assumptions regarding the prevalence and amount of productivity loss have also been used. Study impacts can also extend to children, where a gambling problem in the family can have a negative impact on their academic performance (Suomi et al. 2022). But data was not available to cost this item.

The loss of productivity due to gambling was calculated for both those who gamble and affected others using the following sources:

People who gamble:

- Percentage of people who gamble reporting reduced performance at work or study due to gambling
  - This was sourced from Hing et al. (2021) and found rates of 1.3%, 7.6% and 30.1% for low-risk, moderate-risk and problem gamblers, respectively.
- Representative figures for gambling problems among the Victorian population
  - These figures were sourced from the VPGHS. The rates from Hing et al. (2021) were projected onto these representative figures, including a 20% causality discount, and resulted in 21,730 people who gamble with reduced productivity due to gambling (2,934 low-risk, 7,198 moderate-risk and 11,598 problem gamblers).
- The cost of lost productivity was estimated using the average annual earnings in Victoria in 2023 (ABS 2023b). An assumption that productivity was reduced by one day per week was applied, resulting in a loss of $19,011 per employee per annum.

Affected others:

- Percentage of affected others reporting reduced performance at work or study due to someone else's gambling
  - This was sourced directly from the VPGHS and, after applying a 20% causality discount, found 45,701 people with reduced performance.
- The cost of lost productivity was estimated using the average annual earnings in Victoria in 2023 (ABS 2023b). An assumption that productivity was reduced by one day per week was applied, resulting in a loss of $19,011 per employee per annum.

Table 27 shows the **total estimated cost of reduced productivity due to gambling in Victoria was $1.3 billion**, with $413.1 million of this being linked to people who gamble and $868.8 million to affected others. Because the previous Victorian costing only included lost productivity for people who gamble, the $413.1 million cost in this study is lower than the adjusted $484.3 million from 2014, and this is due to the lower prevalence rates reported for low-risk gamblers in the updated and more representative data source.

Table 27: Cost of productivity loss due to gambling problems in Victoria (2022–23)

Variable	Calculation	Low-risk	Moderate-risk	Problem gambling	Total
Victorian population by PGSI	a	276,023	117,784	48,183	441,990
Productivity loss – people who gamble					
Rate (%) of PGSI group who reported reduced performance due to gambling	b	1.3%	7.6%	30.1%	–
Number who reported reduced performance due to gambling, less 20% causality discount	c = (a × b) × 80%	2,934	7,198	11,598	21,730
Average income in Victoria (annual)	d	$95,056			–
Cost of reduced performance (1 day per week)	e = d × 20%	$19,011			–
Total cost of productivity loss (people who gamble)	f = c × e	$55,787,678	$136,840,928	$220,492,503	$413,121,109
Productivity loss – affected others					
Number who reported reduced performance due to gambling, less 20% causality discount	g	45,701			–
Total cost of productivity loss (affected others)	h = e × g	$868,829,771			–
Total cost of productivity loss	i = f + h				**$1,281,950,880**
Lower bound estimate					$506,370,598
Upper bound estimate					$3,204,877,201

Given the uncertainty around the average amount of lost productivity, upper and lower bounds were calculated. The upper bound was calculated with an assumption of 50% reduced productivity (Whetton et al. 2018) and the lower bound with an assumption of 7.9% (VCEC 2012). Based on these assumptions, the upper bound was calculated at $3.2 billion and lower bound at $506.4 million.

Cost of job loss

Job loss can be a harm experienced by people who gamble (Langham et al. 2016) that results in various costs such as lost earnings, job search costs, employee replacement costs and unemployment benefits. The approach taken to estimate the cost of job loss largely followed the previous Victorian costing (Browne et al. 2017b) but with updated sources. Calculating the cost of job loss included 5 components. The assumptions, approaches and sources for each of these components are outlined below.

Prevalence of job loss:

- Percentage of people who gamble reporting job loss due to gambling
  - This was sourced from Browne et al. (2019) and reported rates of 0.6%, 1.1% and 3.4% for low-risk, moderate-risk and problem gamblers, respectively.
- Representative figures for gambling problems among the Victorian population
  - These figures were sourced from the VPGHS. The rates from Browne et al. (2019) were projected onto these representative figures, including a 20% causality discount, and resulted in 3,773 people who gamble who had lost their job due to gambling (1,393 low-risk, 1,051 moderate-risk and 1,329 problem gamblers).

Loss of income:

- People who gamble will experience a loss of income from unemployment that has been estimated on average to last for 2.8 months (ABS 2024a).
- The average monthly income in Victoria ($7,921) was sourced from the ABS (2023b).

Job searching:

- Due to no recent estimates being available for the cost incurred by the people who gamble searching for a new job, the estimated cost was inflated from the previous Victorian costing (Browne et al. 2017b; VCEC 2012) and resulted in $4,568.

Employee replacement costs:

- In line with previous costings (Browne et al. 2017b; VCEC 2012) an assumption was applied that businesses will incur an employee replacement cost of 10% of the average annual income.
- The average annual income in Victoria ($95,056) was sourced from the ABS (2023b).

Unemployment benefits:

- In line with previous costings (Browne et al. 2017b; VCEC 2012) an assumption was applied that 50% of people who have lost their job will be eligible for unemployment benefits. This cost is incurred by the government.
- People who gamble will experience a loss of income from unemployment that has been estimated on average to last for 2.8 months (ABS 2024a).
- The monthly basic Jobseeker payment ($1,521) was used as a proxy for unemployment benefits (Services Australia 2023).

Table 28 shows the **total estimated cost of job loss due to gambling in Victoria was $143.8 million**. Of this, $82.8 million was linked to loss of income, $17.2 million to job searching, $35.9 million to employee replacement costs and $7.9 million to unemployment benefits. This cost is lower than the adjusted $264.4 million from 2014, and this is due to the lower prevalence rates reported in the updated and representative data source.

The average duration of unemployment in Victoria varied throughout 2023, with the lowest duration being 2.1 months and highest being 3.5 months. Furthermore, a study by the Bureau of Infrastructure, Transport and Regional Economics (2009) estimated recruitment/retraining costs to equal $10,047 per employee. Given the uncertainty around these estimates upper and lower bounds were calculated. The lower bound for the cost of job loss was $121.1 million and the upper bound was $168.5 million.

Cost of absenteeism

Gambling can lead to absenteeism from work or study due to a range of factors such as spending time gambling or ill health because of gambling (Browne et al. 2016). The approach taken to estimate the cost of absenteeism followed the previous Victorian costing (Browne et al. 2017b) but with updated information, including the following sources:

- Percentage of people who gamble reporting being absent from work/study due to gambling
  - This item was sourced from Browne et al. (2022) and found rates of 0.5%, 4.3% and 34.7% for low-risk, moderate-risk and problem gamblers, respectively.
- Representative figures for gambling problems among the Victorian population
  - These figures were sourced from the VPGHS. The rates from Browne et al. (2022) were projected onto these representative figures, including a 20% discount, and resulted in 18,575 people absent from work or study due to gambling (1,107 low-risk, 4,087 moderate-risk and 13,380 problem gamblers).
- Cost of absenteeism
  - The ‘Absence management and wellbeing survey’ (Direct Health Solutions 2023) surveyed 132 Australian organisations regarding absenteeism and calculated an average cost of absenteeism of $3,500 per employee per annum.

Table 29 shows the **total estimated cost of absenteeism due to gambling in Victoria was $65.0 million**, with over two-thirds of this being linked to problem gambling. This cost is lower than the adjusted $69.5 million from 2014, and this is due to the lower prevalence rates reported in the updated data source for low- and moderate-risk gamblers experiencing absenteeism.

An alternative approach to calculate the cost of absenteeism is the ‘cost of time’ approach (Ling et al. 2016). This requires information about the number of actual absent days due to gambling. This level of detail was not collected in the VPGHS, but drawing on other sources it indicated an average of 13.9 days per person who gambles reporting absenteeism (Whetton et al. 2018). This approach also requires the average cost of a day’s employment, factored up by 20% to reflect on-costs, which is $439 for Victoria (ABS 2023b). Using these alternative methodology/assumptions provided an upper bound of $113.3 million for absenteeism.

Table 28: Cost of job loss due to gambling problems in Victoria (2022–23)

Variable	Calculation	Low-risk	Moderate-risk	Problem gambling	Total
Victorian population by PGSI (*n*)	a	276,023	117,784	48,183	441,990
Job loss					
Rate (%) of PGSI group who lost their job due to gambling	b	0.6%	1.1%	3.4%	–
Number who lost their job due to gambling, less 20% causality discount	c = (a × b) × 80%	1,393	1,051	1,329	3,773
Loss of income					
Average duration of unemployment (months)	d	2.8	2.8	2.8	–
Average income in Victoria (monthly)	e	$7,921			
Total cost of income loss	f = c × d × e	$30,560,709	$23,051,686	$29,157,029	$82,769,424
Job searching					
Cost of job search	g	$4,568			
Total cost of job search	h = c × g	$6,364,098	$4,800,385	$6,071,789	$17,236,272
Employee replacement costs					
Employee replacement costs (% of income)	i	10%			
Average income in Victoria (annual)	j	$95,056	$95,056	$95,056	–
Total cost of employee replacement costs	k = c × i × j	$13,242,974	$9,989,064	$12,634,712	$35,866,750
Unemployment benefits					
Proportion of unemployed who are eligible for benefits	l	50%			
JobSeeker payment (monthly)	m	$1,521			
Total cost of unemployment benefits	n = c × d × l × m	$2,933,611	$2,212,798	$2,798,867	$7,945,276
Total cost of job loss	f + h + k + n	$53,101,392	$40,053,934	$50,662,397	$143,817,723
Total cost of job loss					**$143,817,723**
Lower bound estimate					$121,139,048
Upper bound estimate					$168,538,730

Table 29: Cost of absenteeism due to gambling problems in Victoria (2022–23)

Variable	Calculation	Low-risk	Moderate-risk	Problem gambling	Total
Victorian population by PGSI	a	276,023	117,784	48,183	441,990
Rate (%) of PGSI group who were absent due to gambling	b	0.5%	4.3%	34.7%	–
Number who were absent due to gambling, less 20% causality discount	c = (a × b) × 80%	1107	4,087	13,380	18,575
Cost per employee	d	$3,500			–
Total cost of absenteeism	c × d	$3,874,007	$14,306,184	$46,831,661	**$65,011,852**
Lower bound estimate					$65,011,852
Upper bound estimate					$113,273,085

Cost of crime to business

The link between gambling and crime to businesses has been examined across numerous studies and can range from petty theft or dishonesty through to serious fraud (Sakurai and Smith 2003; VCEC 2012). In the current study, both these items were costed to calculate the total cost of crime to businesses. The approach taken for costing petty theft or dishonesty was similar to the previous Victorian costing (Browne et al. 2017b) but with updated sources. The costing of major fraud was a new component not previously considered, the cost of which is borne primarily by the business community, including insurance companies due to compensation claims or insurance-related fraud (Lesieur and Puig 1987). The impact of crime also extends to out-of-pocket costs to affected others. For example, damage to personal belongings or property (Hing et al. 2021a). But due to lack of data this has not been included in the current costing.

The following estimates were used in the calculations.

Petty theft or dishonesty:

- Percentage of people who gamble reporting committing petty theft or dishonesty due to gambling
  - This item was sourced from Hing et al. (2021b) and found rates of 0.3%, 1.7% and 7.1% for low-risk, moderate-risk and problem gamblers, respectively.
- Representative figures for gambling problems among the Victorian population
  - These figures were sourced from the VPGHS. The rates from Hing et al. (2021b) were projected onto these representative figures, including a 20% causality discount. This resulted in 5,092 people who gamble who had engaged in petty theft or dishonesty due to gambling (732 low-risk, 1,630 moderate-risk and 2,729 problem gamblers).
- Value of business loss per incident
  - No recent figures of average loss per incident were available therefore the figure used in the previous Victorian costing (Browne et al. 2017b) was inflated resulting in a figure of $3,428 per incident.

Major fraud:

- Two key pieces of information were used from Warfield (2016), who conducted a review of court cases to examine gambling-motivated fraud. Warfield reported an average of 12.6 major fraud cases in Victoria with an inflated average loss of $695,726 per incident.

Table 30 shows the **total estimated cost of crime to businesses due to gambling in Victoria was $26.2 million**, of which $17.4 million was due to petty theft or dishonesty and $8.8 million due to major fraud. This cost is lower than the adjusted $35.3 million from 2014, but this is due to the lower prevalence rates reported in the updated and nationally representative data source for the petty theft or dishonesty item.

Table 30: Cost of crime to businesses due to gambling problems in Victoria (2022–23)

Variable	Calculation	Low-risk	Moderate-risk	Problem gambling	Total
Petty theft or dishonesty					
Victorian population by PGSI	a	276,023	117,784	48,183	441,990
Rate (%) of PGSI group who engaged in petty theft or dishonesty due to gambling	b	0.3%	1.7%	7.1%	–
Number who engaged in petty theft or dishonesty due to gambling, less 20% causality discount	c = (a × b) × 80%	732	1,630	2,729	5,092
Cost per incident	d	$3,428			–
Total cost of petty theft or dishonesty	e = c × d	$2,510,745	$5,588,602	$9,355,136	$17,454,484
Major fraud					
Number of cases	f	–	–	12.60	–
Cost per incident	g	–	–	$695,726	–
Total cost of major fraud	h = f × g	–	–	$8,766,148	–
Total cost	e + h	$2,510,745	$5,588,602	$18,121,284	$26,220,632
Total cost of crime to businesses					**$26,220,632**
Lower bound estimate					$23,140,176
Upper bound estimate					$29,300,475

Given the uncertainty around the value of loss per incident for petty theft or dishonesty, upper and lower bounds were calculated. These were informed by the VCEC (2012) low- and high-cost estimates, which were inflated to recent years and resulted in a lower estimate of $2,823 and higher estimate of $4,033 per incident. Subsequently, the lower bound of crime to businesses was $23.1 million and upper bound was calculated at $29.3 million.

Cost of fatality by suicide to the economy

The impact of fatality by suicide on affected others has been costed and described in previous sections. But fatality by suicide can also have broader economic costs. *The economic cost of suicide in Australia* report (KMPG 2013) divided these costs into direct and indirect costs. Direct costs associated with suicide fatality were the cost of coronial inquiry, policing, ambulance services and counselling support. Indirect costs to the economy were the lost productivity costs contributing to a loss of economic output. In Victoria in 2012, the total economic cost of suicide was estimated to be around $380 million (KMPG 2013).

Since the previous gambling costing (Browne et al. 2017b), updated research has provided a better understanding of the number of gambling-related suicides in Victoria (Rintoul et al. 2023). This study identified that, over an 8-year period, 4.2% of all suicides in Victoria were gambling-related. But this figure is likely to be conservative because the involvement of gambling problems in suicide attempts and completions is not always known (Rintoul et al. 2023). For example, ensuring police and coroners are capturing the necessary data and are consciously examining the contribution of gambling problems to suicidal behaviour was identified as a key recommendation by Suicide Prevention Australia (Suicide Prevention Australia and Financial Counselling Australia 2022).

In Hong Kong, asking about gambling harm is a standard line of investigation by police when determining the causes of suicide to present to the coroner. One study examined the involvement of gambling in fatality by suicide (Wong et al. 2010) and found that almost one in 10 people who had died by suicide (9.1%) had debt linked to gambling. The result of this study identifies a larger proportion than found by Rintoul et al. (2023), but there are some issues with using this figure in the current costing. As well as significant cultural differences, around the year of analysis in the Hong Kong study (2003), the rate of problem gambling was significantly greater than seen in Australia, around 3.1 to 4.0% (Department of Applied Social Sciences, The Hong Kong Polytechnic University 2017).

Considering all this, the approach to costing fatality by suicide has been updated from the previous costing (Browne et al. 2017b). It applies the methodological approach from KMPG (2013), as well as a more conservative estimation of the number of gambling-related deaths in Victoria, as identified by Rintoul et al. (2023). The following estimates were used for our calculations.

- Number of fatalities by suicide
  - The total number of fatalities by suicide was calculated by multiplying the total number of suicides in Victoria in 2023 (Coroners Court of Victoria 2024, as at May 2024) by the average proportion of gambling-related suicides in Victoria, covering both those who gamble and affected others (Rintoul et al. 2023).
  - The 20% causality discount was not used with this item because this estimate is already highly conservative.
- Cost of fatality by suicide to the Victorian economy
  - Direct costs – the average costs associated with coronial inquiry, policing, ambulance services and counselling support identified in *The economic cost of suicide in Australia* report (KMPG 2013) were inflated to 2023 values.
  - Indirect costs – the average total productivity losses identified by KMPG (2013) were inflated, resulting in a figure of $934,231 for males and $432,575 for females.

Table 31 shows **the estimated cost of the impact of fatality by suicide to the Victorian economy to be approximately $29 million**. This represents a decrease from the adjusted $43 million in 2014 (Browne et al. 2017b), mostly due to a more conservative estimate of the number of deaths linked to suicide.

The estimate of the number of fatalities by suicide applied in the present estimate is very conservative. Therefore, this figure will also represent the lower bound associated with the costing. To identify an upper bound, the number of gambling-related suicides was increased to 6.7%, which is the average of the proportion found in Victoria (Rintoul et al. 2023) and Hong Kong (Wong et al. 2010). This appears appropriate, given the very conservative figure identified by Rintoul et al. (2023) due to the lack of consistent identification of gambling problems in relation to suicide by police and coroners in Australia.

This results in a range of cost impact of fatality by suicide on the Victorian economy to be estimated at between a lower bound of $29 million and an upper bound of $46 million. The range reflects the uncertainty around the prevalence of suicides related to gambling in Victoria.

Table 31: Cost of gambling-related suicide to the Victorian economy (2022–23)

Variable	Calculation	Total
Suicides in Victoria in 2023 (*n*)	a	801
Proportion of gambling-related suicides (people who gamble and affected others)	b	4.2%
Victorian suicides attributable to gambling in 2023 (*n*)	c = a × b	34
Proportion who are male	d	83.2%
Direct costs		
Coronial inquiry costs	e	$3,368
Policing costs	f	$955
Ambulance service costs	g	$3,369
Counselling support	h	$2,541
Total direct costs	i = (e + f + g + h) × c	$344,283
Indirect costs (productivity loss)		
Average for males	j	$934,231
Males (*n*)	k = c × d	28
Average for females	l	$432,575
Females (*n*)	m = c – k	6
Total indirect costs	n = (j × k) + (l × m)	$28,586,041
Total cost of gambling-related suicide	i + n	**$28,930,325**
Lower bound estimate		$28,930,325
Upper bound estimate		$46,009,666

2.2.8 Cost to the Victorian and local governments

This section considers the costs of problem gambling to the Victorian state and local governments, covering the costs of:

- policy, regulation, research and treatment services (Victorian Government)
- the Victorian Government health and human services sector
- the Victorian Government mental health sector
- the Victorian Government sector providing homelessness services
- local governments in Victoria.

Cost of policy, regulation, research (including treatment funding)

The Victorian Government bears significant direct costs in addressing problem gambling, primarily through funding for gambling policy, regulation, research and treatment services. The Department of Justice and Community Safety play a key role in this system, managing gambling policy and the regulation of gambling licensing in conjunction with several key agencies.

The department's Office of Gaming and Liquor serves as the central hub for gambling-related enquiries from the industry, community and other government bodies. It provides strategic policy guidance and support directly to the Minister for Consumer Affairs, Gaming and Liquor Regulation. Also, the VGCCC is tasked with overseeing all regulated gambling activities in the state, including educating the industry and public on regulatory standards and practices.

In addition to these regulatory bodies, the Victorian Responsible Gambling Foundation (VRGF), which closed at the end of June 2024, was a statutory entity dedicated to tackling GRH. It collaborated with partners and communities statewide to educate about gambling risks, supported individuals harmed by gambling, and assisted those impacted by another's gambling behaviour.

In 2022–23, the Department of Treasury and Finance (2022) provided funding for one-off projects aimed at further addressing GRH. These initiatives included extra treatment and support for addictions and mental illness, as well as responses to the Royal Commission into the Casino Operator and Licence and enhancements to gambling and liquor regulation.

The costing approach remained consistent with 2014–15, using the methodology developed by the VCEC in 2012. The calculation of the costs associated with policy, regulation and research involved identifying expenses related to each of these agencies.

- One-off costs to the Victorian Department of Treasury and Finance were $29 million
  - The cost of extra treatment and support for addictions/mental illness linked to gambling in Victoria was $5.6 million.
    a. Total expenditure for extra treatment and support for addictions/mental illness was $54 million (Department of Treasury and Finance 2022).
    b. The proportion of addiction linked to gambling in Australia was 13% (Rethink Addiction and KPMG 2022), with a 20% causality discount applied.
    c. The cost associated with responding to the Royal Commission into the Casino Operator and Licence and enhancing gambling and liquor regulation was $23.4 million (Department of Treasury and Finance 2022).
- The Department of Justice and Community Safety (2023) incurred costs of $21.4 million for policy costs related to problem gambling through a fair marketplace for Victorian consumers and responsible liquor, gambling and racing.
- The cost of regulating problem gambling to the VGCCC was $36.2 million (VGCCC 2023).
- The VRGF expenditure for 2022–23 was $43.3 million (VRGF 2023).

As shown in Table 32, it is estimated that in 2022–23 **the total cost of gambling policy, regulation, research and treatment services to the Victorian Government was $129.9 million**. This figure is more than double the 2014–15 figure of $51.9 million, which is likely linked to the heightened scrutiny and increased resource allocation following the Royal Commission into the Casino Operator and Licence in Victoria (2021).

Table 32: Cost of policy, regulation, research including treatment funding (2022–23)

Variable	Calculation	Total
One-off government costs		
Extra treatment, support for addictions/mental illness	a	$54,000,000
Rate (%) of the total cost of addiction attributable to gambling in Australia	b	13%
Total cost of addiction attributable to gambling in Victoria	c = (a × b) × 80%	$5,616,000
Responding to the Royal Commission into the Casino Operator and Licence and enhancing gambling and liquor regulation	d	$23,400,000
Total one-off costs	e = c + d	$29,016,000
Policy costs related to problem gambling		
Fair marketplace for Victorian consumers and responsible liquor, gambling and racing	f	$21,393,000
Cost for regulating problem gambling		
Victorian Gambling and Casino Control Commission (VGCCC, formerly VCGLR)	g	$36,153,113
Victorian Responsible Gambling Foundation		
Expenditure for 2022–23	h	$43,349,123
Total cost of policy, regulation and research	**e + f + g+ h**	**$129,911,236**
Lower bound estimate		$105,052,189
Upper bound estimate		$147,797,189

The Royal Commission, established in 2021, was tasked with investigating the operations of Crown Melbourne, the largest gambling and entertainment complex in the state. The inquiry exposed numerous instances of illegal and unethical conduct, prompting calls for sweeping reforms and tighter oversight within the gambling industry. The increased expenditure observed in the current analysis likely reflects the government's efforts to strengthen regulatory frameworks, bolster research initiatives and expand support services in the aftermath of the Royal Commission's report.

A lower bound was calculated by adjusting the total found in 2014–15 (Browne et al. 2017b) for inflation and adding the one-off costs from the 2022–23 period. We estimate that the figure of $105.1 million represents a reasonable lower bound for the Victorian Government's expenditure on gambling policy, regulation, research and treatment services in 2022–23. But the actual costs may exceed the initial estimate of $129.9 million. Our upper estimate of $147.8 million includes potential double-counted figures reported in the budgets of both the Department of Justice and Community Safety (2023) and the Department of Treasury and Finance (2023), which may not have been fully accounted for.

Direct costs to local governments

The costing approach remained consistent with the 2017 analysis, using the methodology developed by the VCEC in 2012, where the cost of local government response to EGM applications was calculated using the average cost of written submissions ($27,630), participation in hearings ($37,203) and VCAT appeals ($63,750) and applying inflation. The number of written submissions, hearings and VCAT appeals in 2022–23 was sourced from the VRGF. In line with the 2017 analysis, the entire cost of processing applications directly to local governments was considered, not just the expenses related to problem gambling.

The importance of including expenses to local government related to research, policy development, staff time, community programs and planning appeals in council expenditures on gambling is recognised. But these costs were not factored in due to the absence of comprehensive data.

- The total cost of written submissions to the VGCCC was $111,429.
  - The average cost of submission to the VGCCC with inflation was $37,143 (VCEC 2012).
  - The number of written submissions from councils was 3 (information provided from VRGF).
- The total cost of participation in VGCCC hearings was $150,039.
  - The average cost participation in VGCCC hearings with inflation was $50,013 (VCEC 2012).
  - The number of applications presented at hearings was 3 (information provided directly from VRGF).
- The total cost of VCAT appeals was nil.
  - The average cost of VCAT appeals with inflation was $85,701.
  - No sources related to VCAT appeals were located.

As detailed in Table 33, **the direct costs of gambling to local governments in Victoria 2022–23 was $261,468**. This was less than $393,584, the 2014 cost adjusted to 2022–23. This is explained through the lower number of EGM applications processed in VGCCC hearings.

It is important to acknowledge that beyond costs related to processing EGM applications, local governments may incur extra expenses in relation to gambling-related research, policy development, staff time, community programs and planning appeals. Unfortunately, due to the lack of comprehensive data sources, these costs could not be factored into the current calculations.

We also note that the exclusion of these extra expenses introduces a degree of uncertainty and potentially underestimates the true financial burden borne by local governments in Victoria. The upper and lower estimates were calculated at 5% either side of the cost, with the range falling between $248,395 and $274,541.

Table 33: Total cost of gambling problems to local governments in Victoria

Variable	Calculation	Total
Number of written submissions from councils	a	3
Average cost of submission to the VGCCC	b	$37,143
Total cost of written submissions to the VGCCC	c = a × b	$111,429
Number presented at hearings	d	3
Average cost of participation in VGCCC hearings	e	$50,013
Total cost of participation in VGCCC hearings	f = d × e	$150,039
Number of VCAT appeals	g	0
Average cost of VCAT appeals	h	$85,701
Total cost of VCAT appeals	i = g × h	$0
Total direct costs to local governments	c + f + i	**$261,468**
Lower bound		$248,395
Upper bound		$274,541

Costs to the health and human services system

Gambling problems are inextricably linked to a wide range of physical and mental health issues including depression, anxiety, substance abuse and suicide attempts (Haw et al. 2013). The strain on healthcare resources and social services due to gambling-related problems can be substantial, encompassing the expense of hospital presentations, outpatient treatment and delivering support services for affected people and their families (Browne et al. 2016).

Following the VCEC approach (2012), a lower and upper estimate were calculated, with the addition of an average estimate as calculated in the 2014–15 costing (Browne et al. 2017b). The methodology accounted for those seeking treatment for gambling-induced depression, experiences with violence or suicide attempts.

- The number of Victorians with gambling problems was calculated using data from the VPGHS.
- The total health and human services expenditure ($18.8 billion including capital costs) was calculated by applying indexation to the 2014–15 cost (Browne et al. 2017b).
- The lower estimate calculated the proportion of people who gamble within the total Victorian population with wellbeing issues
  - The number of people who gamble with wellbeing issues in Victoria was calculated using data from the VPGHS by the adding the number of people experiencing depression, violence and suicide attempts due to gambling, less a 20% causality discount (low-risk 8,977, moderate-risk 22,689, problem gamblers 29,134).
  - The proportion of people who gamble with wellbeing issues out of the total Victorian population was calculated by dividing the number of people who gamble with wellbeing issues by the estimated Victorian adult population (ABS 2023c) (low-risk 0.2%, moderate-risk 0.4%, problem gamblers 0.6%).

- The upper estimate calculated the proportion of the Victorian population with gambling problems
  - The number of Victorians with gambling problems was estimated using data from the VPGHS (low-risk 276,023, moderate-risk 117,784, problem gamblers 48,183).
  - The proportion of Victorians with gambling problems was calculated by dividing the estimated number of Victorians with gambling problems by the total Victorian adult population, less 20% causality discount (low-risk 4.3%, moderate-risk 1.8%, problem gamblers 0.7%).
- The average estimate calculated the proportion of Victorians with gambling problems using health and human services
  - An average proportion was calculated using the average of the proportion of people who gamble in the Victorian population with wellbeing issues and the proportion of the Victorian population with gambling problems (low-risk 2.2%, moderate-risk 1.1%, problem gamblers 0.7%).
  - The average proportion was multiplied by the Victorian adult population to determine the number of people who gamble with wellbeing issues (low-risk 114,898, moderate-risk 58,458, problem gamblers 33,840).
- The total cost was calculated by multiplying the total health and human service expenditure by the proportion of the Victorian population with gambling problems and wellbeing issues.

As shown in Table 34, **the share of total health and human service expenditure to the Victorian Government due to gambling problems was $750.9 million**. This represents a decrease from the adjusted $795.7 million in 2014 (Browne et al. 2017b).

Given the inherent complexity in attributing specific healthcare costs to gambling-related problems and the potential for overlapping or unaccounted factors, we opted for a conservative approach by presenting a range of cost estimates. The lower estimate of $220.3 million was calculated by considering only the direct costs associated with treatment-seeking individuals experiencing gambling-related concerns such as depression, violence or suicide attempts. Conversely, the higher estimate of $1.3 billion assumed a direct causal relationship between gambling problems and the entirety of healthcare expenditures for people experiencing related issues, which may lead to an overestimation.

Table 34: Share of total health and human service expenditure to the Victorian Government due to gambling problems (2022–23)

Variable	Calculation	Low-risk	Moderate-risk	Problem gambling	Total
Total health and human services expenditure	a	$18,821,080,499			–
Estimated Victorian adult population	b	5,193,289			–
Lower estimate of % of population with gambling problems using health and human services					
People who gamble with wellbeing issues	c	8,977	22,689	29,134	60,800
Percentage of people who gamble of total Victorian population with wellbeing issues	d = c/b	0.17%	0.44%	0.56%	–
Upper estimate of % of population with gambling problems using health and human services					
Estimated Victorian population with gambling problems (*n*)	e	276,023	117,784	48,183	441,990
Percentage of the Victorian population with gambling problems (less 20% causality discount)	f = (e/b) x 80%	4.25%	1.81%	0.74%	–
Average estimate of % of population with gambling problems using health and human services					
Percentage of the Victoria population with gambling problems and wellbeing issues	g = (d + f) / 2	2.21%	1.13%	0.65%	–
Average estimate of the number of problem gamblers with wellbeing issues	h = b × g	114,898	58,458	33,840	207,196
Total	**a × g**	$416,402,019	$211,859,050	$122,640,952	**$750,902,020**
Total cost health and human services					**$750,902,020**
Lower bound estimate (a × d)					$220,345,701
Upper bound estimate (a × f)					$1,281,458,339

Costs to the mental health sector

Gambling problems have been linked to various mental health conditions, including depression, anxiety disorders and substance abuse, contributing to a heightened demand for mental health services (Suomi and Dowling 2021). In Victoria, the mental health sector plays a vital role in providing treatment, support and rehabilitation services to people struggling with gambling-related mental health issues and their families.

The approach used to estimate the cost to the Victorian mental health sector was consistent with that used in the 2014–15 costing using updated data (Browne et al. 2017b). The calculation was based on the high estimate approach by the VCEC in 2012. This method treated the proportion of problem gamblers using mental health services as those with 'mental wellbeing issues' – a figure also applied to the broader health and human services sector – and divided this by the total number of individuals using mental health services in Victoria.

The cost to the mental health sector due to gambling was calculated using the following sources:

- The number of the Victorian population with gambling problems was calculated using data from the VPGHS.
- Estimated proportion of the Victorian population with gambling problems who used mental health services
  - The number of people who had used mental health services in Victoria was estimated to be 87,513 using data from the VPGHS.
  - The number of people in each risk group with 'mental wellbeing issues' was estimated using data from the VPGHS and included experience of depression, attempted suicide or experiences of violence due to gambling, less 20% causality discount and further assumption that 45.1% go on to receive treatment (ABS 2023d) (4,048 low-risk, 10,233 moderate-risk and 13,139 problem gamblers).
  - The number of people with gambling problems using mental health services was divided by the general population using mental health services to determine the proportion of the population with gambling problems accessing mental health services (4.6% low-risk, 11.7% moderate-risk and 15.0% problem gamblers).
- The total expenditure on mental health services in Victoria was $1.3 billion, sourced from the Department of Health (2023) mental health and wellbeing services annual report 2022–23.
- The total cost to the mental health sector was calculated by applying the proportion of the population who have gambling problems and access mental health services to the total expenditure on Victorian mental health services.

As shown in Table 35, **the estimated costs of gambling problems to the Victorian mental health sector in 2022–23 was calculated at $407.3 million**. Almost half of these costs were linked to problem gamblers ($195.2 million), and costs decreased across moderate- and low-risk levels ($152.0 million and $60.1 million, respectively).

Acknowledging the potential biases and inaccuracies inherent in making inference from self-reported data to concrete state-level costs, we adopted a conservative approach by relying on government records. This involved calculating the number of people who gamble with wellbeing issues who use mental health services and assuming that 45.1% will go on to access professional treatment (ABS 2023d). The total of $407.3 million was less than the 2014–15 total adjusted for inflation and population to 2023 ($416.5 million). An upper bound of $498.9 million was calculated by removing the 20% causality discount applied within the calculation of people with mental wellbeing issues, but the number of suicide attempts linked to gambling for the low-risk group retained a 100% discount.

Table 35: Total cost of gambling problems to Victorian mental health sector (2022–23)

Variable	Calculation	Low-risk	Moderate-risk	Problem gambling	Total
Total expenditure on mental health services in Victoria	a	$1,300,000,000			–
Victorian adult population	b	5,193,289			–
Estimated number who used mental health services in Victoria	c	87,513			–
Estimated number of people who gamble with wellbeing issues, less 20% causality discount	d	8,977	22,689	29,134	60,800
Estimated number of people who gamble with wellbeing issues who used mental health services	e = d × 45.1%	4,048	10,233	13,139	27,421
Estimated percentage of the Victorian population who have gambling problems and have used mental health services	f = e/c	4.63%	11.69%	15.01	–
Total cost to the mental health sector	g = a × f	$60,140,074	$152,007,155	$195,186,002	**$407,333,231**
Lower bound estimate					$407,333,231
Upper bound estimate					$498,924,414

Cost of homelessness services

Gambling problems can lead to financial instability, loss of housing and familial disruptions, increasing the risk of homelessness (Vandenberg et al. 2022). At the last Census, 30,660 Victorians were without a home, equating to 27% of Australia's total (112,494) (ABS 2021). People experiencing homelessness due to gambling-related issues require specialised support services including temporary accommodation, case management and assistance in securing stable housing. Estimating the economic burden of providing homelessness services to those affected by gambling problems is essential for ensuring adequate funding and resource allocation within the homelessness sector.

The approach used to estimate the cost to the Victorian mental health sector was consistent with that used in the 2014–15 costing using updated data (Browne et al. 2017b), with the addition of calculating a lower and upper estimate.

The cost to the homelessness sector due to gambling was calculated using the following sources:

- The estimated number of Victorians homeless due to gambling problems was 5,050.
  - Calculated by applying the estimated number of homeless in Victoria by the prevalence of homelessness in Victoria due to gambling problems, less 20% causality discount.
- The estimated number of people homeless in Victoria in 2023 was 34,307 (AIHW 2024).
  - A total of 76,238 adults sought specialised homelessness services, with approximately 45% experiencing homelessness.
- The prevalence of homelessness in Victoria due to gambling problems was estimated to be 18.4% (AIHW 2009).
- The average annual cost per person for homelessness services was $6,220.
  - Each bed provided for people experiencing homelessness costs $124,400 per 20 years (Witte 2017).

As detailed in Table 36, **the estimated cost of using homelessness services in Victoria linked to gambling problems in 2022–23 was $31.4 million**.

Table 36: Share of homelessness services attributable to gambling problems (2022–23)

Variable	Calculation	Total
Estimated number of homeless in Victoria	a	34,307
Prevalence of homelessness in Victoria due to gambling problems	b	0.184
Estimated number of Victorian homeless due to gambling problems (less 20% causality discount)	c = (a × b) × 80%	5,050
Average annual cost per person for homelessness services	d	$6,220
Total cost of gambling-related homelessness	c × d	**$31,410,940**
Lower bound estimate		$22,347,994
Upper bound estimate		$129,355,504

In estimating the costs associated with providing homelessness services to those affected by gambling-related homelessness, we calculated an upper bound of $129.4 million and a lower bound of $22.3 million to account for potential uncertainties. The average annual cost estimate of $6,220 per person specifically accounts for the costs of purpose-built placements for homeless individuals ($124,400 per placement over a 20-year period) (Witte 2017).

The lower estimate of $22.3 million was calculated using the average annual cost per person ($6,220) and the proportion of the Victorian population who are homeless, assuming that 0.47% of the population is homeless (24,408) (ABS 2021). Conversely, the upper estimate of $129.4 million was calculated by using the estimated number of homeless in Victoria and the value of a ‘new bed’ per year of $25,615 (Witte 2017).

Calculating the full costs of homelessness in Victoria extends beyond housing expenses, incorporating various essential services such as meals, laundry and counselling, often provided by charities (Anglicare Victoria 2024). These extra services present complexities in accurately assessing the overall financial impact. Further discussion on charities and non-profit organisations is covered in the next section, highlighting their importance in the broader context of supporting people with gambling problems.

2.2.9 Cost to non-profit organisations

This section considers the costs associated with providing services related to gambling addiction to non-profit organisations in Victoria, with a focus on financial counselling.

The terms ‘non-government organisation’, ‘non-profit’ and ‘charity’ often refer to distinct operational frameworks but are used interchangeably. Though they differ, all 3 operate outside of government control, aim to enhance societal wellbeing and typically draw funding from similar sources. In our 2014–15 analysis, the authors acknowledged a limitation in quantifying extra costs related to gambling such as prevention, education, treatment and compliance efforts by non-government agencies. These entities often provide vital wellbeing support, and their funding stems from various federal and state sources.

Costs associated with providing services related to gambling addiction

The 2014–15 analysis (Browne et al. 2017b) did not account for costs incurred by non-profit organisations, acknowledging this as a limitation. In response, a new calculation approach has been implemented in the present study to capture the economic effects of non-profit initiatives.

The cost to the non-profit sector for providing services related to gambling addiction was calculated using the following sources:

- The estimated proportion of the Victorian population with gambling problems was calculated using data from the VPGHS, less 20% causality discount.
- The share of the federal government expenditure on financial counselling in 2022–23 apportioned to the Victorian population.
  - Calculated using the Victorian proportion of Australia (25.6%, ABS 2023c; VPGHS) and the total federal cost of financial counselling to the federal government ($5.8 million) (Financial Counselling Australia 2021).
- The costs attributable to the proportion of the Victorian population with gambling problems
  - Calculated by applying the adjusted proportion of the Victorian population with gambling problems (low-risk 4.25%, moderate-risk 1.81%, problem gambler 0.74%) by the federal expenditure adjusted to the Victorian population ($1.5 million) (Financial Counselling Australia 2021).
  - The total federal spend on financial counselling for people with gambling problems was $100,724 (low-risk $62,902, moderate-risk $26,841, problem gambler $10,980).
- The expenditure of Financial Counselling Victoria Inc (FCVic) to provide financial counselling services to Victorians with gambling problems (FCVic 2023).
  - Calculated using the expenditure of FCVic to provide financial counselling to the general population and the proportion of the Victorian population with gambling problems (low-risk $88,351, moderate-risk $37,701, problem gambler $15,423).
  - The cost to FCVic (2023) for a gambling lead position ($115,000).
- The cost to the Department of Justice and Community Safety (Financial Counselling Australia 2021) for Gambler’s Help financial counselling in 2022–23.

As shown in Table 37, **the total costs associated with providing services related to gambling addiction to non-profit organisations in Victoria was $3.2 million**.

A lower estimate of $3.1 million was calculated by discounting the costs to FCVic (2023) for providing services to the general population, apportioned to those with gambling problems. When calculating the upper estimate, a greater level of uncertainty was apparent. Due to the difficulty in obtaining comprehensive data for all non-profit organisations that provide services related to gambling problems, and accurately attributing a portion to gambling issues, the actual cost of

Table 37: Costs associated with providing services related to gambling addiction to non-profit organisations in Victoria (2022–23)

Variable	Calculation	Low-risk	Moderate-risk	Problem gambling	Total
Federal government					
Proportion of the Victorian population with gambling problems	a	5.31%	2.27%	0.93%	–
Proportion of the Victorian population with gambling problems (less 20% causality discount)	b = a × 80%	4.25%	1.81%	0.74%	–
Federal spend 2022–23 for community sector organisations financial counselling	c	$5,785,500			
Victorian proportion of Australia	d	0.2557			
Federal spend 2022–23 adjusted to the Victorian population	e = c × d	$1,479,352			
Costs attributable to proportion of the Victorian population with gambling problems	f = b × e	$62,902	$26,841	$10,980	$100,724
Financial Counselling Victoria					
Expenditure/operating costs to provide services to the general population	g	$2,077,875			
Costs attributable to gambling problems	h = b × g	$88,351	$37,701	$15,423	$141,475
FCVic Gambling Lead position 2022–23	i	$115,000.00			
Department of Community Justice and Safety					
Gambler's Help financial counselling 2022–23	j	$2,850,000			
Total cost to non-profit organisations	f + h + i + j				**$3,207,199**
Lower bound estimate					$3,065,724
Upper bound estimate					$205,615,276

The upper estimate of $205.6 million was calculated by including the Department of Social Services (2023) federal expenditure relating to non-government organisations ($26.1 billion), adjusted to the proportion of the Victorian population with gambling problems who seek treatment.

2.2.10 Cost to federal government

Estimating the costs of gambling to the federal government, specifically apportioned to Victoria, is essential for understanding both the financial burden and the allocation of resources for gambling harm prevention. The federal government invests in a variety of programs through federal departments such as the Australian Institute of Health and Welfare, which contributes to research on gambling's health impacts. The Treasury addresses financial policies related to gambling, while the Australian Federal Police deals with illegal gambling activities. These departments collaborate, within their specific roles, on gambling-related issues, ranging from health impacts to financial and legal frameworks.

The Department of Social Services and the Australian Communications and Media Authority (ACMA) aim to address gambling issues at their core. These investments support research, policy development, regulation and direct support services.

The costs to the federal government related to gambling are integrated across various funding areas already accounted for in this report. To avoid duplicating figures, only unique costs were included. One source was identified – the development of the Australian National Self-Exclusion Register by ACMA – and apportioned to the Victorian population. ACMA plays a significant role in the context of online gambling regulation in Australia. It is responsible for enforcing regulations that protect consumers involved in online wagering and works to ensure online gambling services comply with the standards and protections set out in Australian law, particularly in the area of online gambling.

The cost to the federal government for regulating online gambling was calculated using the following sources:

- The cost to ACMA of developing the Australian National Self-Exclusion Register apportioned to the Victorian population was $1.5 million.
  - The total cost to ACMA was $6 million (ACMA 2023).
  - The cost attributable to the Victorian population was found by applying the Victorian proportion of the Australian population (25.6%).

As shown in Table 38, **the estimated cost of regulating online gambling to the federal government, apportioned to the Victorian population, was $1.5 million**. The inclusion of the full costs associated with online self-exclusion in this report is based on the understanding that individuals who opt for self-exclusion are likely experiencing or have experienced gambling problems. This decision to self-exclude often stems from a recognition of gambling harm, making it a critical factor in assessing the overall impact of gambling-related issues in Victoria.

Table 38: Cost to the federal government to regulate online gambling (2022–23)

Variable	Calculation	Total
Cost to ACMA for developing the Australian National Self-Exclusion Register	a	$5,970,000
Victorian proportion of the population	b	0.25574
Total cost to regulate online gambling	c = a × b	**$1,526,761**
Lower bound estimate		$1,450,423
Upper bound estimate		$1,832,113

There was low uncertainty about the cost being less than this amount, so a 5% discount was applied to determine the lower bound estimate of $1.45 million. Conversely, it was likely that $1.5 million was an underestimation because there was only a single costing source available to reference and other sources may well exist. To account for this potential underestimation, the cost was inflated by 20%, resulting in an upper bound estimate of $1.8 million.

2.3 Costs attributable to each form of gambling

As detailed throughout this report most, but not all, costs of gambling can be linked to gambling problems or GRH: outcomes that are themselves driven by excessive time and money absorbed by gambling. Browne et al. (2023) undertook a comprehensive statistical analysis to determine the contribution of each form to reported gambling problems. This was done using a combined dataset of more than 71,000 respondents from representative gambling prevalence surveys across multiple Australian jurisdictions (excluding WA). The analysis provides clear evidence on the relative impact of different gambling forms on population-level gambling problems. Employing multiple regression techniques, the analysis models the unique effects of engagement frequencies for each gambling activity while adjusting for participation rates.

The results show that EGMs are the primary driver of gambling problems nationally, estimated to be responsible for between 52% and 57% of all GRHs. Casino table games, sports betting and race betting collectively account for about one-third of gambling problems, while lotteries and bingo show virtually no unique association with harmful gambling, after accounting for co-occurring engagement with other forms. Given the large, robust and representative nature of the underlying data, these estimates offer strong evidence on the relative contribution of each form to gambling problems. One caveat to applying this breakdown to Victoria is that the states differ somewhat in terms of the relative contribution of each form. Nevertheless, there is enough similarity in broad contributions across states (excluding WA) to apply this breakdown to Victoria.

As noted throughout this report, most costs linked to gambling come from gambling problems and harm on regulated products. Exceptions to this rule include illegal offshore wagering ($305 million) and direct costs to the government for research, regulation and services ($1.3 billion). Excluding these costs from the total yields form-attributable costs of $12.5 billion of the total $14.1 billion. This subtotal can be divided among forms, in proportion to the contribution of each form to gambling problems, as shown in Table 39. The total contributions listed add to 94%, with the remaining 6% linked to private, offshore and illegal forms of gambling not captured in this report.

Browne et al. (2023) used 2 statistical decomposition methods to work out how much each form of gambling contributes to total gambling problems in Australia:

- **Attributable risk method** (a): For each survey respondent, they multiplied how frequently the person gambled on each form by the beta coefficient capturing the riskiness of that form for gambling problems. Then, instead of adding these risks for each person, they added up the risks attributable to each form across all respondents. This gives an estimate of how much each form contributes to total gambling problems.
- **Relative importance method** (b): They also used a technique called the ‘lmg method’, which looks at how much each form improves the ability to predict gambling problems when added to a statistical model, considering all possible orderings. This is a form of effect size calculation that avoids bias from the order predictors are added. The resulting percentages reflect how much variation in gambling problems can be uniquely linked to the frequency of gambling on each form.

Table 39: Cost of gambling attributable to each form in Victoria (2022–23)

Form	Harm proportion (Method a)	Harm proportion (Method b)	Cost of form (a) excl. excess spend	Cost of form (b) excl. excess spend	Excess spend	Total cost (a)	Total cost (b)
EGM	57%	52%	$4,091,464,360	$3,732,563,977	$2,627,602,086	$6,719,066,446	$6,360,166,063
Casino	9%	14%	$646,020,688	$1,004,921,071	$394,607,162	$1,040,627,850	$1,399,528,233
Wagering	19%	20%	$1,363,821,453	$1,435,601,530	$1,742,265,678	$3,106,087,131	$3,177,867,208
Keno	4%	6%	$287,120,306	$430,680,459	$27,694,801	$314,815,107	$458,375,260
Instant scratch tickets and lotteries	5%	2%	$358,900,382	$143,560,153	$52,098,684	$410,999,066	$195,658,837
Total	**94%**	**94%**	**$6,747,327,190**	**$6,747,327,190**	**$4,844,268,411**	**$11,591,595,601**	**$11,591,595,601**

Note: Proportion totals add up to 94% because they exclude costs not linked to a gambling form.

In simple terms, although the methods are different numerically, both aim to untangle the overlapping influences of different gambling forms to quantify how much each one independently drives gambling problems in the population, considering both the inherent riskiness of the form and how many people take part in it. We provide calculations for both approaches to capture this source of method variance.

The proportion of gambling problems estimated by these 2 methods are provided in the first 2 columns of Table 39. Since we have calculated direct estimates of the cost of excess spend by form elsewhere, the total ($4.84 billion) is deducted from form-attributable costs of $12.48 billion. Of this, 6% is linked to non-regulated forms of gambling (for example, offshore wagering) to yield a final subtotal of $7.18 billion (bottom row). After calculating the attributable cost by form, we added the form-specific excess spend to yield a total cost by form (final 2 columns) via both the attributable-risk method and the relative importance method. On methodological grounds, we have greater confidence in the attributable-risk method (a) and refer to this elsewhere in the report.

This approach to attributing economic costs to forms is relatively crude. Nevertheless, it relies on a simple and sound assumption that harm-related costs for each form are proportional to gambling problems linked to each form. As described, the breakdown of gambling problems to forms is based on a very large population-representative and Australia-specific dataset, with similar results being given by 2 alternative decomposition methods. Although the dataset is a recent one, and includes a large proportion of Victorian data, it also included data from other similar jurisdictions (for example, NSW). The main source of uncertainty is therefore that the decomposition may not perfectly reflect the current gambling composition of Victoria. Nevertheless, we have high confidence that the accounting of costs by form is broadly accurate.

Mirroring our findings regarding excess spend linked to each form, EGMs accounted for about half of total gambling costs ($6.36 to $6.72 billion), followed by wagering ($3.11 to $3.18 billion) and casino gambling ($1.04 billion to $1.40 billion). Keno and instant scratch tickets accounted for a very small proportion of attributable costs. We have no significant evidence to attribute costs to lottery ticket purchases.

2.4 Evaluation of policy options

As the breakdown in this report makes clear, most costs linked to gambling stem from excessive expenditure and the harms that arise from this spending. Unfortunately, there is a lack of evidence for proven ways to reduce GRH (Blank et al. 2021). Calls for a public health approach to tackle harmful gambling were first made in the late 1990s. To date, there has been limited research and policy evaluation on gambling to inform this approach. In the United Kingdom, a mapping review commissioned by the National Institute for Health and Care Research found little evidence on measures to reduce the public health burden of GRH (Department of Health and Social Care 2022). An umbrella review by McMahon et al. (2019) on prevention and education interventions only identified low-quality evidence from individual-level interventions targeting people who gamble who are experiencing severe problems. There is therefore relatively little knowledge about measures that have long-term effectiveness or measures that are likely to be successful if implemented (Regan et al. 2022).

Nevertheless, some expert opinion and real-world experience informs policy options that are likely to be effective. Regan et al. (2022) conducted a 3-round Delphi process to elicit knowledge from experts on effective policy options. While cost-effectiveness was not assessed, some of the top measures based on combined effectiveness and implementation ratings were:

- banning advertising
- mandating minimum intervals in repeated play
- establishing a multi-operator self-exclusion scheme

- requiring operators to provide data to an independent data bank
- increasing operators' duties/taxes above inflation.

The most comprehensive review of policy options for the Australian context was undertaken by Livingstone et al. (2019). The authors identified several promising policy interventions based on available evidence. For EGMs, key recommendations include:

- modifying structural characteristics (for example, removing losses disguised as wins, reducing maximum bets)
- implementing universal pre-commitment systems with binding limits
- restricting accessibility through reduced venue size and operating hours.

For online wagering, restricting in-play betting, providing accurate pricing information and implementing pre-commitment and self-exclusion systems were all supported.

Despite there being strong grounds to support policy interventions that should work, it is challenging to cost the realised benefits without an existing implementation or a large-scale trial on a national or even regional scale. Therefore, a distinct perspective can be gained by considering case studies of implemented or tested policy interventions and/or policy options currently under consideration. In the following sections we consider specific policy changes made or proposed in other jurisdictions and calculate their impact in the Victorian context. But it should be noted the detailed dynamic modelling of policy changes is beyond the scope of this study. The effects of policies in other jurisdictions may not have the same effect in Victoria, so treat these as indicative.

2.4.1 Finland

Marionneau et al. (2024) conducted a longitudinal study that examined the impact of various policy changes related to gambling in Finland between 2019 and 2022. The key policy changes included:

- reducing land-based electronic gambling machine (EGM) numbers from 18,500 to less than 10,000 and closure of 14 arcades during 2020 to 2022
- imposing COVID-19 restrictions on EGM and table game availability over 3 waves in 2020–21
- reducing monthly loss limits for fast-paced online gambling from €2,000 to €500 ($3,442 to $861 AUD) between May and October 2020
- imposing a permanent reduction of daily loss limits for fast-paced online gambling from €1,000 to €500 ($1,721 to $861 AUD) from May 2020
- introducing mandatory identification for non-casino EGMs in January 2021 and for arcade EGMs and table games in July 2021
- implementing mandatory pre-commitment for all land-based EGMs in September 2021.

These policy measures had a significant effect. Total gambling consumption declined significantly between 2019 and 2022, mainly due to a 60% reduction in land-based EGM consumption. The declines in land-based EGM sales were not offset by online alternatives or other close substitutes in the long term. However, during the first COVID-19 wave, there was some substitution of land-based table games by online alternatives. Land-based horse race betting and possibly sports betting were also substituted by online horse race betting during this period. COVID-19 appeared to boost the already existing trend of increasing digitalisation of gambling. The share of Veikkaus' (the state-run operator) online revenue increased from 32% in 2019 to 51% in 2021. Nevertheless, the experience of Finland proves the effectiveness of public health-oriented policies like availability restrictions and mandatory pre-commitment in reducing the total and excessive consumption of gambling and the corresponding cost of GRH.

Evaluation of EGM play restrictions

Finland represents a different cultural and regulatory environment from Victoria. Also, Marionneau et al. (2024) only analysed the effects of restrictions on total gambling losses, rather than problems, harms or the costs arising from these impacts. Nevertheless, there are reasons to expect that the specific mandated changes may be applied to this economic costing. First, the policy measures undertaken were specific to certain forms also available in Victoria. Second, as illustrated in our analysis of spend by different PGSI risk categories, higher risk groups account for the bulk of excessive expenditure. Finally, EGMs account for a similar disproportionate share of gambling losses in both jurisdictions. We assume that the effects of measures to restrict expenditure (loss limits, pre-commitment) should have a corresponding or larger effect on at-risk groups. And since excessive expenditure is the principal mechanism by which other harms and costs arise, it is reasonable to propagate this effect onwards to other form-specific costs.

The main limitation in applying the Finnish experience to Victoria is that a variety of measures were introduced in progressively, which overlapped with intermittent shutdowns of venues due to COVID-19 restrictions. But the authors present a time-series regression model that shows the (%) impact of each measure on *total* gambling losses: reduced monthly loss limits (–10.0%), reduced daily loss limits (–11.0%), mandatory identification for non-casino EGMs (–9.3%) and mandatory pre-commitment for land-based EGMs (–9.2%). Simultaneously, progressive shutdown of EGMs accounted for a 15% reduction, which must be accounted for when considering the effects of the play restrictions. Also, the monthly loss limit is more restrictive than the daily loss limit, so the effect of this measure should be understood as cumulative on the former. This aside, these figures suggest that each of the restrictions make a distinct contribution to a total reduction in gambling losses.

Because the application of Finnish restrictions to Victoria is most clear-cut in the case of EGMs, we will focus on their impact on losses for this form specifically. Although tabular data was not reported, Figure 6 from Marionneau et al. (2024) shows that, in 2022, EGM losses stabilised at ~41% of the 2019 total, after all effects of COVID closures appear to have been resolved. Transposed to Victoria and converting currencies, a corresponding effect would represent $3.97 billion in cost reductions ($6.72 billion × 0.41), of which $2.87 billion can be linked to play restrictions. Table 40 summarises these calculations, as applied to the Victorian context.

Table 40: Summary of the effects of EGM restrictions on gambler losses, and projected cost savings for EGM-attributable costs in Victoria

Restriction	Total effect	Scaled to EGMs (b)	Projected Victorian cost reduction
EGM shutdowns	15.0%	27.5%	–
$800 daily loss limit	11.0%	20.1%	$796 million
+$800 monthly loss limit	10%	18.3%	$726 million
Mandatory identification, non-casino EGMs	9.3%	17.1%	$678 million
Mandatory precommitment land-based EGMs	9.2%	16.9%	$670 million
Total	**–**	**100%**	**$2.87 billion**

Notes: Total effect is the effect reported by Marionneau et al. (2024) on total industry revenue. These effects are scaled to EGMs to explain 100% of the total reduction in EGM revenue (~59% decrease) from 2019 to 2022. These components are then applied to the total attributable costs to EGMs in Victoria assuming a similar decrease in losses and EGM-attributable costs.

2.4.2 Norway

Rossow and Hansen (2016) considered evidence from Norway on the effects of policy changes on gambling behaviour and harms. In 2007 Norway implemented a ban on EGMs. The country later reintroduced EGMs but with mandatory pre-commitment measures in place. These restrictions did not appear to translate into increases in online gambling, although online gambling did increase in the longer term. Rossow and Hansen (2016) used helpline data to examine the effects of gambling policy in Norway. The restrictions on gambling availability, particularly on EGMs, occurred from 2006 to 2009. The restrictions led to significant decreases in total gambling turnover. There was a 10% net decrease in 2006 after the ban on banknote acceptors, a 28% decrease in 2007 with more EGM restrictions, and a 31% decrease in 2008 when the full EGM ban was in effect. The number of helpline calls from people who gamble citing EGMs as their main problem decreased substantially (by 62%) after the banknote acceptor ban in 2006, and there were few such calls in 2007 to 2008 during the full EGM ban. The number of referrals to treatment for gambling problems decreased by 23% after the banknote acceptor ban and 57% more after the EGM ban. A prospective study of EGM players showed reductions in gambling participation, frequency and problems 4 months after removing EGMs.

Population surveys generally showed lower prevalence of problem gambling in Norway after the policy restrictions compared with before, especially among young people, though the changes varied somewhat across studies. The Norwegian experience suggests that strong restrictions on harmful forms of gambling like EGMs, such as banning them entirely or requiring mandatory pre-commitment, can help reduce harms, at least in the short term. There may be some substitution to online gambling over the longer term, but the initial policy effects appear to have been a net reduction in gambling problems as evidenced by decreased helpline contacts and population prevalence surveys.

Evaluation of EGM restrictions: banknote acceptors and night-time gambling

There are some key similarities between Norway before they introduced gambling restrictions and the current situation in Victoria in terms of EGM availability and market penetration. In 1997 Norway had an EGM density of 5.75 machines per 1,000 inhabitants, which was among the highest in the world next to Australia and New Zealand. EGMs were easily accessible and placed in supermarkets, gas stations, kiosks, bars and other frequently used areas. This widespread accessibility of EGMs in community venues is similar to the current situation in Victoria. In 2005 EGM gambling in Norway accounted for two-thirds (66%) of the gross gambling turnover. In Victoria, as seen in this report, EGMs also account for a very high proportion of total gambling expenditure.

The complete ban on EGMs in Norway (July 2007) for an entire year led a net decrease in referrals to problem gambling treatment by 57%, which is consistent with the total market share of gambling turnover. This supports using referrals to problem gambling treatment related to EGMs as a proxy for gambling problems arising from EGMs. The ban on banknote acceptors (July 2006) caused gross turnover on EGMs to fall by 17% in the 6 months after the ban compared with the same period in the previous year. The number of helpline calls from people who gamble on EGMs decreased by 62% in the period. The disproportionate effect on gambling helpline calls suggests that this measure tends to specifically target the excessive spend of those who gamble who are experiencing the greatest problems. Norway also introduced restrictions on night-time EGM gambling, with bans in force between midnight and 6 am. Combined with the banknote acceptor ban, this led to another 55% decrease in EGM turnover. Unfortunately, helpline data is not available to gauge the added effect of night-time bans on gambling problems. But overlap in the periods in which these measures were in effect means that some of the observed differences may be due to this extra measure. We will therefore consider the estimated effects of these 2 measures in conjunction.

There is some evidence from the Norwegian data for substitution effects. Although gambling helpline calls decreased from 711 to 253, helpline calls due to other games increased from 129 to 180. This is consistent with the changes in gross turnover from EGMs and other forms. It would therefore be reasonable to assume that this difference is due to problem gambling behaviours transferring from EGMS to other forms. Nevertheless, the net impact is that of a 51.5% decrease in help-seeking. It is also worth noting that at-risk gambling prevalence rates slightly increased from 3.5% to 4.3% before and after this period, but these studies employed different measures (NODS at-risk, PGSI moderate-risk and problem gambling, respectively), meaning that we cannot interpret this difference. In principle, the total decrease in help-seeking in Norway might apply to all harm-related costs for all forms. But, given jurisdictional differences, we shall apply them only to EGM-attributable costs.

Given these considerations, we estimate that a ban on banknote acceptors combined with night-time gambling restrictions is likely to lead to a 51.5% decrease in costs linked to EGM gambling including excess spend and downstream costs. **This would result in a total cost reduction of approximately $3.46 billion to the Victorian community** (51.5% × $6.72 billion). In other words, the cost to the Victorian community would reduce from $6.72 billion to $3.26 billion.

2.4.3 Western Australia

WA has a unique gambling policy compared with the rest of Australia. EGMs in WA are only accessible at a single casino located in the central business district of Perth.

In the rest of Australia, EGMs are widely accessible in casinos, hotels and clubs across metropolitan, suburban and regional areas. While other forms of gambling are similarly available across jurisdictions, the accessibility of EGMs is much more restricted in WA. Because WA policy differs in this one key respect from other states, and is otherwise similar, it can be understood as a form of natural experiment on the effect of this policy.

Russell et al. (2023) used population prevalence data to compare WA with the rest of Australia. Although gambling participation was higher overall in WA, the following effects were observed:

- EGM participation was approximately half that of the rest of Australia. Aggregate gambling problems and GRH were about one-third lower in WA compared with the rest of Australia.
- Self-reported attribution of harm from EGMs by people who gamble was 2.7 times lower in WA and 4 times lower for harm linked to EGMs by affected others.
- Mediation analyses found that less frequent EGM use in WA accounted for most of the discrepancy in gambling problems compared with other states.
- There was little evidence of substitution to other gambling forms causing problems in WA despite the lower EGM accessibility.

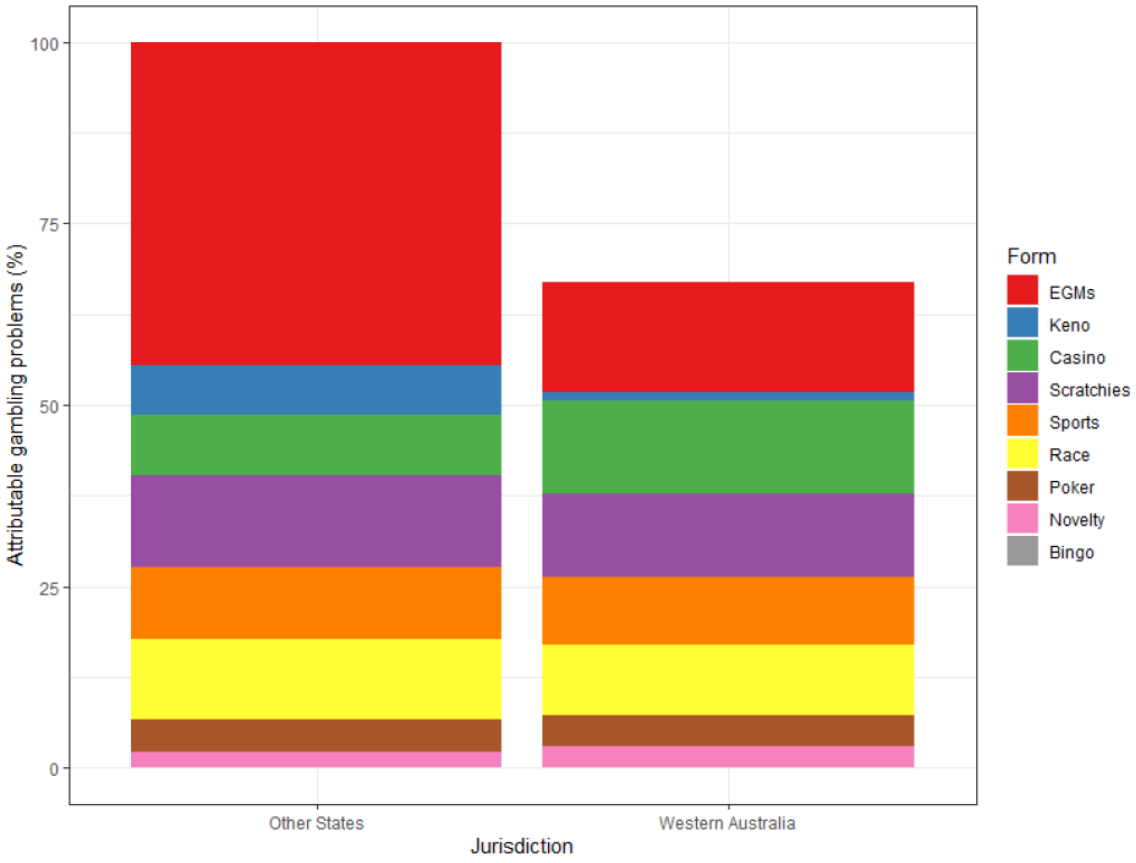
Russell et al. (2023) concluded that the restricted accessibility of EGMs in WA compared with their widespread availability elsewhere in Australia led to not only lower EGM consumption but also substantially lower levels of gambling problems and harm in the WA population. The reduced gambling harm was directly linked to the EGM policy restrictions rather than to differences in consumption of other gambling forms.

Evaluation of EGM geographical restrictions

In an analysis conducted for an expert opinion provided to the Perth Casino Royal Commission, Rockloff et al. (2021) used similar data to that of Russell et al. (2023) and compared attributable gambling problems to EGMs and other forms for WA and the rest of Australia. As shown in Figure 7, the overall lower rates of gambling problems in WA compared with the rest of Australia can be largely linked to EGMs, with little evidence of substitution to other forms. Specifically, while EGMs accounted for 44.6% of gambling problems in other states, this proportion would drop to 15.2%

when scaled to account for a decrease in total gambling problems. Although there was little evidence of substitution effects, these are included in this estimate. WA has a similar concentration of the population in the capital city, and otherwise broadly homogenous demographic and regulatory characteristics, which makes it reasonable to apply this 'natural experiment' effect to Victoria. The counterfactual in which EGMs were restricted only to a single Melbourne casino therefore involves a reduction in EGM-attributable costs of about two-thirds: 100 – 15.2/44.6 = 65.9%. It is reasonable to assume that this reduction would apply to all form-attributable costs, including excess spend by at-risk groups and harms to people who gamble and affected others. Accordingly, we estimate that implementing a policy of **restricting EGMs to a single capital city casino would yield a reduction in costs of $4.34 billion** (0.659 × $6.72 billion [from Table 39] = $4.34 billion). This results in a total cost to the Victorian community of $2.38 billion rather than $6.72 billion.

Figure 7: Decomposition of total gambling problems to that attributable to each form, by jurisdiction



Excerpt from Rockloff et al. (2021, p. 14), reproduced with permission.

2.4.4 Tasmania

The Tasmanian Government has announced reforms to EGM regulations aimed at minimising GRH[6]. The key feature is the implementation of a statewide mandatory pre-commitment system using player cards for cashless gaming.

Key features of the proposed system include:

- a requirement for all EGM players to register for and use a player card
- pre-set default limits of $100 per day, $500 per month and $5,000 per year
- the ability for players to lower limits at any time or increase 'within parameters'
- universal statewide application across hotels, clubs and casinos.

The Tasmanian Government states that the pre-commitment system aims to curtail unaffordable losses for at-risk players while having a minimal impact on those who gamble recreationally. This represents the strictest harm minimisation approach aimed at preventing excessive expenditure of any Australian jurisdiction to date. But, at the time of writing, there is some ambiguity about how easy it will be for players to increase the default limits, and to what degree capacity to afford losses at the increased limit will be assessed.

Evaluation of mandatory pre-commitment on EGM excessive spend

For the purposes of evaluation, we restrict our calculations to the excessive spend part of the costing because it is this category that is most directly affected by these restrictions. But we can also assume there will be significant downstream reductions in other costs related to gambling harm because these are mainly driven by excessive gambling losses. The maximum yearly spend under the new guidelines is $5,000 per annum. Therefore, the annual gambling spend reported by people in all PGSI risk categories and summarised in Table 12 can be limited to $5,000 to evaluate this counterfactual. The ease with which people who gamble can increase these limits, and their proclivity to do so, represents a major source of uncertainty in evaluating this policy. Nevertheless, we assume that 20% of people who gamble would have spent more than $5,000 will either apply for an exemption or otherwise circumvent these restrictions to yield an actual spend up to 20% more ($6,000).

Based on self-reported data scaled to industry revenue figures, and across all PGSI categories and forms, a striking proportion of gambling expenditure is due to people who gamble spending beyond the $5,000 limit on each form. Overall, $6.27 billion of the $7.41 billion in Victorian gambling losses (84.7%) reflects money spent beyond the $5,000 limit. Table 41 shows the impact of this $5,000 limit applied to each form on costs linked to excessive spend. For EGMs, total excess spend costs in Victoria would drop by 97.6%, from $2.63 billion to just $65 million. This dramatic decrease in attributable costs would have a correspondingly large negative effect on player losses, and thereby government and industry revenue.

[6] At the time of writing, Tasmania was committed to introducing a mandatory pre-commitment system for EGMs. However, in November 2024 the Tasmanian Government announced it would not be proceeding with the reforms

Table 41: Comparison of excess EGM spend under existing and counterfactual ($5,000 limit) scenarios

Gambling form	Scenario	PGSI	N		Average spend		Aggregate spend		Excess spend costings relative to NPGs							
									Total		PG only		LR, MR, PG, discounted			
	Calculation		**a**		**b**	**c = b – b 'NPG'**	**d = a × b**		**e = a × c**				**f**		**g = e – f**	
			Sample	Population (weighted)	Per person	Excess above NPG	Population $	% by PGSI group	%	$	%	$	%	Discount	%	$
EGMs	Current	NPG	681	355,598	$532	$0	$189,194,744	5.5%	0.0%	$0	0.0%	$0	0.0%	100%	0.0%	$0
		LR	166	85,228	$3,448	$2,916	$293,827,636	8.6%	7.3%	$248,482,499	0.0%	$0	2.9%	60%	2.9%	$99,392,999
		MR	114	64,568	$10,160	$9,628	$656,037,146	19.2%	18.2%	$621,684,156	0.0%	$0	14.6%	20%	14.6%	$497,347,324
		PG	60	36,477	$62,393	$61,861	$2,275,920,474	66.6%	66.1%	$2,256,513,069	66.1%	$2,256,513,069	59.5%	10%	59.5%	$2,030,861,762
		Total					*$3,414,980,000*		*91.6%*	*$3,126,679,723*	*66.1%*	*$2,256,513,069*	*76.9%*		*76.9%*	*$2,627,602,086*
EGMs	Counterfactual	NPG	681	355,598	$271	$0	$96,527,925	39.2%	0.0%	$0	0.0%	$0	0.0%	100%	0.0%	$0
		LR	166	85,228	$728	$457	$62,059,180	25.2%	15.8%	$38,923,907	0.0%	$0	6.3%	60%	6.3%	$15,569,563
		MR	114	64,568	$932	$660	$60,150,843	24.4%	17.3%	$42,623,809	0.0%	$0	13.9%	20%	13.9%	$34,099,047
		PG	60	36,477	$752	$480	$27,423,855	11.1%	7.1%	$17,522,118	7.1%	$17,522,118	6.4%	10%	6.4%	$15,769,907
		Total					*$246,161,804*		*40.2%*	*$99,069,834*	*7.1%*	*$17,522,118*	*26.6%*		*26.6%*	*$65,438,516*

NPG = non-problem gambler, LR = low-risk gambler, MR = moderate-risk gambler and PG = problem gambler

Given the dramatic apparent impact of such a policy on losses for people who gamble and health-economic costs, it is worthwhile carefully considering the assumptions that go into evaluating this policy option. First, it assumes that the distribution of spend reported by those who gamble in population-representative surveys broadly reflects reality. As discussed earlier in this report in section 2.2.3 (refer to 'Cost of excessive spend by people who gamble'), it does not affect our assumptions if people who gamble systematically underestimate their losses if the relative degree of underestimation is broadly similar across PGSI categories, which appears to be the case. The distribution of spend observed in the 2023 prevalence data is broadly similar to that observed in prior surveys in Victoria and other Australian jurisdictions. Random-digit dial telephone surveys are considered the most representative method of making inference to the population, and the sample employed (n = 11,000) is large. Overall, while the implied proportion of spend over the $5,000 limit (84.7%) is notable, there do not appear to be strong grounds to doubt this figure. One theoretical issue is that excess spend is calculated relative to mean non-problem gambler spend. Since some non-problem gamblers spend more than $5,000, the policy options reduces the baseline from which excess spend is calculated. Nevertheless, this has a relatively minor effect on the estimated savings, which are a function of the proportion of spend that is treated as excess, and the total estimated spend. That is, the $5,000 limit reduces the 'slice of the pie' that is excess spend, as well as the total 'size of the pie'. As shown in Table 41, the largest impact on player losses is by dramatically shrinking the total aggregate player losses. Nevertheless, we emphasise that our estimate of the savings is predicated on relying on the very large relative difference between the self-reported spend of problematic gamblers and non-problem gamblers, as found not only in the current dataset, but also in prior population prevalence surveys. Given the substantial policy implications of this apparent difference, more research is warranted to confirm these figures.

The more tentative assumption relates to the effectiveness of implementing a $5,000 limit. The impact costed here assumes that non-adherence would be effectively prevented by means of carded play, that players who sought to increase their loss-limits would increase them only moderately, and that large numbers of people who gamble with problems would not find ways to circumvent the restrictions or substitute their spend on other forms. On one hand, research comparing WA to the rest of Australia suggests there would not be large-scale substitution of EGM spend on other forms. A conservative nominal figure of 20% could be applied here. It is difficult to specify discounting percentages regarding the other assumptions relating to effectiveness because they depend very strongly on the specifics of the implementation. For example, if players can easily apply for an increase to their loss-limit by filling in a web-form, without supplying evidence on an ability to support the extra losses, then the savings linked to this mandatory pre-commitment system could be reduced to almost zero. On the other hand, if applications require supporting evidence and are evaluated properly by a responsible agency, then we would anticipate very low non-compliance. People may, for example, share cards or solicit cards from others. Nevertheless, this secondary-market activity for cards is likely to be limited due to the practicalities involved in finding others willing to share, particularly if this sharing is illegal.

In summary, after factoring in a 20% discount to account for diverting expenditure to other forms that do not require mandatory pre-commitment, but assuming proper implementation that prevents at-risk gamblers from increasing their spend, **we find savings of $1.58 billion on excessive spend on EGMs alone**. We would also expect similarly large decreases in costs linked to harms arising from EGMs, significantly reducing the attributable cost (Table 39) of $4.09 billion. It is difficult to put a precise estimate on the exact reduction. But, to give an indication of the lower bound, the non-parametric (Spearman correlation) of gambling spend to gambling problems is 0.817, implying that 67% of variation in gambling problems and associated harms is linked to expenditure. This is almost certainly a fully causal relationship, given the definition of

gambling problems. A 97.6% drop in excess spend on EGMs would therefore imply 0.976 × 0.67 (causal effect) × 0.80 (discount) × $4.09 billion (of non-excess spend EGM costs) = **$2.67 billion of further cost reductions** associated with concomitant problems and harms. This is likely to be an underestimate, since the true causal association of excess spend and gambling problems is likely to be higher than the estimate, which is biased lower due to various sources of measurement error. We therefore conservatively estimate the total impact of an effective EGM pre-commitment scheme in Victoria to be **$4.25 billion**, which is 63% of the total linked cost of this form.

2.5 Discussion

This study aimed to provide an updated estimate of the economic and social costs of gambling harm in Victoria for the 2022–23 financial year. Building on the methodology established in the previous Victorian costing study (Browne et al. 2017b), this report incorporates new data sources, research findings and methodological improvements to provide a comprehensive assessment of the impacts of gambling harm. As before, the study adopted a public health approach, examining costs associated with gambling problems across a broad spectrum of severity, from low-risk gambling through to severe problem gambling. It also considers the significant impact of gambling harm on affected others, such as family members and friends, and encompasses both tangible and intangible costs.

The key findings from this study reveal that the total cost of gambling to Victoria is approximately $14.1 billion, almost double that of the total size of the industry. Most of these costs are linked to intangible costs, such as a negative consumer surplus from excessive spend, and the impacts on HRQoL for both those who gamble and affected others. The study also found that a significant proportion of harms are borne by those in the low- and moderate-risk categories, highlighting the importance of considering the full spectrum of gambling harm in policy and harm minimisation efforts. On the other hand, the costs of excessive spend are more strongly concentrated in the higher risk gambler groups. While this might seem superficially contradictory, it arises from the fact that health outcomes are bounded by a unit cost per person, while capacity to sustain financial losses varies greatly from person to person depending on their financial status. In theory, realised losses can be conceptualised as a multiplicative effect of gambling problems and capacity to sustain via income, savings or borrowings. As both variables are highly positively skewed, the outcome is one in which a small proportion of people, concentrated in the higher risk categories, contribute a very large proportion of industry revenue.

Finally, we found that the costs are disproportionately associated with certain forms of gambling, particularly EGMs and wagering, which together account for most of the total costs.

2.5.1 Methodological improvements

This study builds on and improves the methodology used in the 2017 *The social cost of gambling to Victoria* report. First, the current study employed the Gambling Harms Scale (GHS-10) and its counterpart for affected others (GHS-10-AO) to more accurately measure the prevalence and severity of GRH. These instruments, which have been validated and benchmarked against health utility measures, provide a more comprehensive assessment of the impacts of gambling on both people who gamble and those close to them. For example, the GHS-10-AO was able to capture affected other work impacts, which could not be costed in the previous costing study.

Second, the study incorporated both direct and indirect elicitation methods for estimating HRQoL decrements associated with gambling harm. Direct methods, such as TTO and VAS, were used to establish the maximum health-related impact associated with severe

gambling harm. Indirect methods, involving statistical analyses of the relationship between GHS scores and health utility measures, were employed to identify the relative HRQoL decrements across the spectrum of harm severity. By combining these approaches, the study leveraged the strengths of each method while mitigating their respective limitations.

Finally, the study applied parametric bootstrapping techniques to estimate the uncertainty surrounding the cost estimates. This approach involved treating each cost component as an independent random variable with a triangular probability distribution, defined by lower and upper bounds and a modal value. By replicating this process thousands of times, the study generated a range of plausible cost estimates, providing a more robust understanding of the potential variability in the total cost of gambling harm in Victoria.

2.5.2 Key findings and implications

The results of this study highlight several key findings that have important implications for understanding and addressing the costs of gambling harm in Victoria. First, the study found that intangible costs, including both excess losses and HRQoL impacts, make up a substantial portion of the total cost estimate. The HRQoL decrements experienced by people who gamble and affected others across the spectrum of harm severity account for a significant share of the overall burden of gambling harm. This finding reflects the tendency of the industry to realise tangible economic benefits but to externalise intangible costs, and it underscores the importance of considering the broader, non-financial impacts of gambling when determining policy.

Second, the study shows the significance of the prevention paradox in the context of gambling harm. While people with severe gambling problems experience the greatest harm on an individual level, the aggregate impact of harm is more significant among the larger population of low- and moderate-risk gamblers. This finding highlights the need for harm minimisation strategies that target the full spectrum of problem gambling severity, rather than focusing solely on those with the most severe problems.

Third, the study reveals that affected others, such as family members and friends of people who gamble, bear a substantial portion of the total costs of gambling harm. This finding emphasises the need for policies and interventions that support not only people who gamble but also those close to them who are impacted by GRH. Providing resources and support for affected others should be a key component of any comprehensive approach to reducing the societal costs of gambling.

Fourth, the study found that all gambling forms are most definitely not equal in terms of incurring societal costs. Certain forms of gambling, particularly EGMs and wagering, are associated with disproportionate levels of harm and costs. EGMs alone account for about half of the total costs, while wagering contributes to a significant portion as well. This finding suggests that targeted harm minimisation strategies aimed at these specific forms of gambling would be particularly effective in reducing the overall societal costs of gambling harm.

Fifth, an important consideration for future costing studies, and for gambling policy more broadly, is the unequal distribution of gambling's costs and benefits across the population. Our study highlights a significant disparity: while the presumed economic and recreational benefits of gambling are enjoyed by a large segment of the population, the substantial costs are borne by a relatively small group. As evidenced by gambling prevalence surveys, those experiencing the most severe gambling-related harms often belong to already vulnerable or disadvantaged groups, potentially exacerbating existing social inequalities. For instance, people with pre-existing mental health issues, those from lower socioeconomic backgrounds, or those living in more deprived areas tend be disproportionately affected. While our current study does not differentiate costs based on demographic factors, future costing studies might consider incorporating such analyses to

provide a more comprehensive picture of gambling's societal impact and to better inform policy decisions aimed at mitigating harm where it is most acute.

Finally, the findings of this study have important implications for policy and harm minimisation strategies in Victoria. The significant costs associated with gambling harm across the spectrum of problem gambling severity underscore the need for a comprehensive, public health approach to addressing this issue. This may include measures such as:

- more funding for prevention and treatment services
- stricter regulations on the availability and design of high-risk gambling products
- targeted interventions for at-risk populations.

2.5.3 Limitations and future directions

All economic costings are subject to various forms of limitations and uncertainty, as has been highlighted throughout this report. In this section we summarise and expand on the key areas affecting the conclusions.

Methodological and model-based uncertainty

One of the main challenges in conducting this type of economic costing is the inherent uncertainty associated with estimating the costs of gambling harm. Many of the cost components, particularly those related to intangible impacts such as HRQoL decrements, are subject to significant uncertainty due to the complexity of measuring and valuing these effects. While the HRQoL decrements we employed are informed by a synthesis of all available research, quantification of the health impacts of gambling remains a contested issue and contributes to methodological uncertainty in our estimates. This is reflected in the relatively wide confidence intervals for several of the key cost estimates in the study.

Data gaps, relevance and quality

Several categories of cost items were not included in this estimation due to data constraints. For example, impacts to children have been largely omitted from this study due to lack of available data. Wider community impacts are also difficult to cost. For example, gambling-related harm can erode social capital through the deterioration of trust and civic engagement. Gambling problems can weaken social bonds within families and communities, diminishing trust, a key component of social capital (Browne et al. 2016). Also, people with gambling issues often withdraw from community activities and civic responsibilities, further reducing social capital by decreasing overall civic participation (Reith and Dobbie 2011). But these types of impacts cannot be costed at this time due to lack of data.

There are other categories of cost items not included in this estimation due to the complexity around the causal relationship between gambling and certain types of harm. For example, gambling harm can lead to stress and neglected health care, potentially resulting in substance use, psychological issues and long-term chronic illnesses (Black et al. 2013). As a result, it has been suggested that people with gambling problems have a 1.8 times increased risk of mortality (Karlsson and Håkansson 2018). But untangling these causal relationships is challenging because gambling problems are often associated with multiple stressors (Tulloch et al. 2020). While some of these impacts are likely captured by the GSH-10 (used to calculate HRQoL in this study), or the suicide estimates, future inclusion of added stress/neglected health impacts would require careful consideration to avoid double counting.

Ideally, all data sources would be current, pertaining to Victoria specifically and to the period under consideration. But in practice we have made recourse to the most recent

data available and, in some cases, making assumptions that data from similar or broader jurisdictions (for example, Australian national data) applies to Victoria. However, it is a strength of the current costing that we have relied heavily on the very recent (2023) population study, while the prior 2017 economic costing in Victoria had to rely on data collected in 2014.

Also, some cost categories, such as those related to crime, bankruptcy and suicide, are informed by more limited data sources. These categories often rely on self-report data or extrapolations from other jurisdictions, which may introduce added uncertainty into the estimates. In contrast, other cost categories, such as the prevalence of gambling harms and excessive gambling losses, are informed by more robust data sources such as the 2023 VPGHS. While these estimates are still subject to uncertainty due to the inherent variability in the data, they are based on more direct and representative measures of the impacts of gambling harm in Victoria.

This study makes several assumptions across various cost estimates and relies heavily on self-reported data, as well as data extracted from publications, as detailed throughout the report. There are several potential issues with this approach; for example, self-reported prevalence data may be subject to biases, potentially leading to under- or over-reporting. Multiple methods have been used to address these risks, including discounting where appropriate, providing upper and lower bounds, and bootstrapping. But these methods are not perfect. For example, applying a uniform 20% discount to account for causality across all harm types and severity levels may oversimplify complex relationships. Overall, there are multiple points of potential uncertainty; therefore, the estimates in this study need to be treated with caution. This uncertainty highlights the difficulties in determining which costs to include and balancing between including more potential costs (risking greater uncertainty) or not accounting for a potential harm. This study includes many significant costs commonly excluded (such as impacts on affected others). Still, there are other costs that are difficult to quantify and were excluded, such as legacy harms.

Assessing negative impacts, not net cost/benefit

It is important to note that this study does not include estimates of consumer surplus, which economists often argue should be considered in social cost analyses. Consumer surplus represents the value or satisfaction that consumers derive from a product or activity beyond its cost. In the context of gambling, this could be the enjoyment or entertainment value experienced by non-problem gamblers. But we have chosen to exclude consumer surplus from our analysis for several reasons. First, for people experiencing gambling problems, the concept of consumer surplus becomes problematic as their consumption is driven more by behavioural dependence than by genuine satisfaction. Second, from a public health perspective, the significant social costs associated with gambling – including financial hardship, health issues and family breakdowns – often far outweigh the benefits captured by consumer surplus on an individual level. Third, quantifying consumer surplus for gambling activities presents substantial methodological challenges and uncertainties. By focusing on the costs without offsetting them against potential benefits, our study provides a clear picture of the burden that gambling imposes on society. While this approach may not result in a ‘net’ costing in the strictest economic sense, we believe it offers a more relevant and actionable assessment for public health policy considerations. This is particularly true because feasible policy interventions are aimed at interrupting excessive spend by people experiencing problems, not a consideration of whether gambling should be banned or markedly restricted for non-problem gamblers. They therefore generally do not have implications for the net consumer surplus that is assumed to be enjoyed by unharmed and non-problem gamblers. Nevertheless, some research has considered the net effects of

gambling, attempting to weigh up the value derived by non-problem gamblers and those experiencing gambling harm (Rockloff et al. 2021).

Exclusion of legacy harms

Future research could focus on addressing some of these limitations and expanding the scope of the analysis. One key area for more investigation is incorporating legacy harms, which are the ongoing impacts of gambling harm that persist even after a person's gambling problems have resolved. An important aspect of this is the impact of gambling problems among young people, where early onset may have a negative impact on their academic performance, social relationships and subsequently their life trajectory (Langham et al. 2016; Warren and Yu 2019). While the current study does not explicitly account for these longer term effects, developing methods to measure and value legacy harms could provide a more complete picture of the total costs of gambling harm over time.

Applying policy options to Victoria

It's important to acknowledge the limitations of our policy evaluation models, particularly those based on experiences from other jurisdictions such as Finland, Norway, Western Australia and Tasmania. While these evaluations provide valuable insights into potential policy impacts, they should be interpreted with caution. The effectiveness of gambling policies can vary significantly across different cultural, regional and temporal contexts. For instance, our assumption that Finland's EGM restrictions would achieve a similar 41% reduction in EGM losses if implemented in Victoria may be overly simplistic. Gambling behaviours and markets are complex systems that can respond to policy changes in unpredictable ways, including potential substitution effects between different gambling forms or the emergence of new gambling opportunities. Also, the social and regulatory environments in Victoria differ from those in the compared jurisdictions, which could influence policy outcomes. Our models do not fully account for these nuances or the potential long-term adaptations of the gambling industry and consumers to new regulations. A more sophisticated approach, such as dynamic simulation modelling that incorporates local data and accounts for the complex interrelationships between different gambling activities, would be necessary to provide more accurate predictions of policy impacts in the Victorian context. Therefore, while our policy evaluations offer useful starting points for considering potential interventions, they should not be taken as precise forecasts of policy outcomes in Victoria. Policymakers should consider these estimates as indicative rather than definitive and should supplement them with local pilot studies or staged implementations to gauge actual effects in the Victorian setting.

Future directions

Another potential avenue for future research is conducting more detailed analyses of specific cost categories, demographic groups and specific classes of products. For example, examining the geographical distribution of gambling harm and its associated costs could help identify high-risk areas and inform targeted harm minimisation strategies. A fine-grained evaluation, for example, of excessive spend and harms arising from easily accessible EGMs located in pubs and clubs in suburban locations, could provide excellent guidance as to regulation and for considering new limits on product availability (for example, restricting EGM licenses within an area). Similarly, investigating the costs of gambling harm among specific demographic groups, such as young people or older adults, could provide valuable insights for tailoring prevention and treatment efforts to the behavioural profile and needs of these populations.

While the tangible economic benefits of gambling realised by industry and government are relatively straightforward to assess, quantifying the intangible recreational benefits of

gambling in a rigorous manner is arguably even more challenging than measuring the costs. Like the 2017 Victorian economic costing, this was outside the scope of this study. A 'balanced' accounting, which incorporates all tangible and intangible costs and benefits, would be a significant enterprise and would require new research on eliciting the value that people who gamble receive from access to this recreational activity. Nevertheless, such information, especially applied to specific forms, would provide valuable guidance for regulation.

Finally, future studies could explore alternative methodologies for estimating the costs of gambling harm, such as discrete choice experiments or willingness-to-pay approaches. The hybrid approach for combining direct and indirect estimates of HRQoL estimates appears to be a particularly promising avenue of research. While there seems to be consensus on the upper bound of HRQoL impact, debate continues around the nature of the curve and particularly regarding those reporting fewer harms. Applying a variety of broad health and wellbeing instruments, rather than more narrow physical health and mobility measures, could address this source of uncertainty. Because of the large contribution of HRQoL impacts, this benefit would spread to future economic costings. By a process of triangulation, and combined with results from methods already employed, these methods could refine our estimates of the value that people place on avoiding or reducing GRH and could help to validate or refine the cost estimates derived from the current study.

2.5.4 Conclusion

This study provides a comprehensive and updated assessment of the economic and social costs of gambling harm in Victoria, revealing a total cost of $14.1 billion for the 2022–23 financial year. By incorporating methodological improvements, such as the use of validated harm measurement instruments applied to population prevalence data, this report offers a more accurate and nuanced understanding of the impacts of gambling harm across the state. The study found that the cost of gambling is approximately twice the size of the $7.2 billion industry. The findings underscore the substantial burden borne by individuals, families and society, with intangible costs related to excessive losses and HRQoL making up a significant portion of the total cost. Furthermore, the report sheds light on the disproportionate costs associated with specific forms of gambling, particularly EGMs and wagering, and the substantial harms experienced by affected others, such as family members and friends of people who gamble. While the study acknowledges the inherent limitations and uncertainties inherent in estimating the costs of gambling harm, insights provide guidance for policymakers and stakeholders in developing targeted and evidence-based harm minimisation strategies.

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Appendices

Appendix 1: Total losses on each form by gambling risk category

Gambling form	Non-problem gambler	Low-risk gambler	Moderate-risk gambler	Problem gambler
EGMs	$189,194,744	$293,827,636	$656,037,146	$2,275,920,474
Wagering	$346,735,807	$274,153,600	$663,623,852	$1,303,286,740
Casino table games	$75,832,553	$43,445,406	$121,681,637	$348,960,403
Lotteries and scratch tickets	$584,355,257	$91,207,856	$52,687,649	$35,549,238
Keno	$10,628,055	$4,437,400	$12,352,644	$21,981,901

Appendix 2: Number of Victorians with gambling harms, quality of life impacts per person and aggregate impact across the spectrum

Description	1	2	3	4	5	6	7	8	9	10
Number of harmed people who gamble	163,069	75,822	43,416	24,616	12,412	11,269	17,553	9,815	6,024	3,864
HRQoL decrement associated with GHS-10	0.1	0.19	0.26	0.31	0.35	0.37	0.38	0.41	0.43	0.45
Total years lived with a disability	16,307	14,406	11,288	7,631	4,344	4,170	6,670	4,024	2,590	1,739

Appendix 3: Detailed breakdown of gambling-related costs in Victoria

Cost Item	2022–23	Lower bound	Upper bound
Direct costs to Victorian local governments	$261,468	$248,395	$274,541
Federal costs to regulate online gambling	$1,526,761	$1,450,423	$1,832,113
Provision of services related to gambling addiction	$3,207,199	$3,065,724	$5,686,042
Bankruptcy	$3,585,294	$1,257,998	$6,243,894
Fatality by suicide of person who gambles – impact on affected others	$14,700,652	$14,700,652	$29,192,660
Crime	$26,220,632	$23,140,177	$29,300,475
Fatality by suicide	$28,930,325	$28,930,325	$46,009,666
Homelessness services	$31,410,940	$22,347,994	$129,355,504
Suicidal attempts impact on gambler	$32,329,463	$30,712,990	$226,472,113
Absenteeism	$65,011,852	$65,011,852	$113,273,085
Policy, regulation, research	$129,911,236	$105,052,189	$147,797,189
Job loss	$143,817,723	$121,139,048	$168,538,730
Suicide attempts of person who gambles – impact on affected others	$193,976,777	$74,357,765	$410,393,300
Depression	$199,565,524	$189,587,247	$794,265,227
Victorian justice system	$289,379,572	$289,379,572	$516,703,618
Illegal offshore wagering	$305,429,510	$305,429,510	$323,244,838
Experiences of violence	$349,581,743	$332,102,656	$367,060,830
Divorce and separation	$358,268,488	$322,441,640	$552,103,450
Mental health sector	$407,333,231	$416,500,112	$665,217,864
Health and human services systems	$750,902,020	$138,817,071	$1,281,458,339
Productivity loss	$1,281,950,880	$506,370,598	$3,204,877,201
HRQoL impact of gambling harm to affected others	$1,609,652,105	$707,837,664	$2,511,466,545
HRQoL impact of gambling harm on the gambler	$3,039,207,321	$1,427,985,494	$4,650,429,147
Gambling excess spend	$4,844,268,411	$3,294,268,110	$5,814,420,341

Appendix 4: Changes in cost categories since the 2015 costing

Harm category	2022–23	2014–15
Financial impacts	$5,153,283,215	$2,020,853,677
Emotional and psychological (gambler)	$3,271,102,307	$2,387,911,815
Relationships and family	$2,526,179,765	$3,281,250,134
Productivity loss and work/study impacts	$1,545,931,411	$896,234,247
Costs to the Victorian Government and local governments	$1,319,818,896	$1,717,120,066
Crime	$289,379,572	$150,178,631
Costs to non-profit organisations	$3,207,199	$0
Federal government costs	$1,526,761	$0

Appendix 5: Literature review

Background

This literature review begins with a summary of the 2017 economic costing of gambling in Victoria (Browne et al. 2017b). This includes a broad summary of the literature on negative impacts from gambling at that time. We then provide a more detailed description of implemented economic costing studies that informed the 2017 effort. This is followed by an overview of the methods used in the costing itself. In the next section, we review developments since the prior Victorian economic costing. This section also focuses on implemented costing studies undertaken in Australia and internationally. It considers key issues around gambling harm including important developments in the quantification of the health and wellbeing impacts of harmful gambling, impacts to affected others and financial opportunity costs, since these represent crucial components of any economic costing.

Research on impacts from gambling that informed the 2017 costing

Browne and colleagues (2017b) conducted a systematic review using the guidelines presented in the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses; Page et al. 2021) statement, initially identifying 173 peer-reviewed publications from a search across 11 databases.

After an initial screening for duplicates and relevance, 112 were excluded for various reasons, including being duplicates, theory papers, not specific to gambling or review papers. The remaining 61 articles were reviewed, with 2 major themes identified:

- the impact of gambling-related harms (GRH) on individuals, affected others and the community (25 articles)
- the impacts of the gambling industry, primarily at the community level (36 articles).
- The 36 papers on gambling industry impacts covered a wide range of topics, including:
  - government regulations on gambling taxation
  - revenue redistribution
  - the effects of casino gambling revenue allocation.

These studies were diverse, focusing on various regions and aspects of the gambling industry, but were excluded from the review since they did not relate to assessing the direct impact or social costs of gambling.

The 25 articles on harm yielded knowledge about impacts that could be categorised as being at the individual level, harms to affected others and community-level harms (Langham et al. 2016). Most research was conducted in the United States or Australia, and these studies covered a wide range of individual-level harms including:

- financial problems (Brown et al. 2012; Grote and Matheson 2014; Hing et al. 2012; Kerber et al. 2015; Svensson et al. 2013; Walker et al. 2012)
- relationship difficulties (Black et al. 2012; Hing et al. 2012; Kerber et al. 2015; Svensson et al. 2013; Walker et al. 2012)
- violence (Hing et al. 2012)
- anxiety and depression (Hing et al. 2012; Holtslag et al. 2008; Maierova et al. 2014; Svensson et al. 2013)
- substance use or abuse (Cheung 2014; Hayatbakhsh et al. 2012; Larsen et al. 2013; Maierova et al. 2014; Najavits et al. 2011; Svensson et al. 2013)
- suicidal ideation or attempts (Maierova et al. 2014)
- costs associated with help-seeking behaviour (Gainsbury et al. 2014; Hing et al. 2012)
- loss of employment (Kerber et al. 2015; Maierova et al. 2014)
- criminal activity (Cheng et al. 2014; Cheung 2014; Hing et al. 2012).

Only one study focused on the harm to others close to the person who gambles, revealing that affected others experienced similar negative consequences to those who gamble (Svensson et al. 2013).

Community-level harms were analysed in relation to gambling participation, access to gambling venues, income and expenditure (Brown et al. 2012; Moellman and Mitra 2013; Pickernell et al. 2013; Tu et al. 2014), with studies finding associations between gambling and various social issues like:

- unemployment (Moellman and Mitra 2013; Pickernell et al. 2013)
- crime (Cheng et al. 2014; Cheung 2014; Humphreys and Soebbing 2014; Moellman and Mitra 2013)
- tourism (Pickernell et al. 2013)
- business bankruptcy (Grote and Matheson 2014)
- negative impacts on Indigenous communities (Hing et al. 2012; Wolfe et al. 2012; Young et al. 2011).

The review also highlighted studies on the perceptions of the positive and negative impacts of casino gaming in communities, showing a complex picture of gambling's societal effects (Lee et al. 2010; Wan 2012).

Costing studies prior to 2017

The 2017 literature review focused on the costs associated with gambling, identifying detailed economic costing reports mostly from the non-academic journal 'grey' literature and so out of scope of the systematic review (Anielski and Braaten 2008; Dickerson et al. 1998; Productivity Commission 1999, 2010; The Allen Consulting Group et al. 2011; VCEC 2012).

Also, a comprehensive framework examining GRH, developed by Central Queensland University (Browne et al. 2016), built on the work of Langham et al. (2016) to categorise harm into 8 types: financial, relationships, emotional/psychological distress, health, cultural, work/study performance, criminal activity, life course and intergenerational harms. The health-oriented frameworks quantified the health-burden of GRHs so did not address the financial burden these harms impose. Nevertheless, before 2017, a number of national and international organisations had attempted to quantify the cost of gambling, with a seminal economic costing framework developed by the Australian Productivity Commission (1999) being particularly influential in informing subsequent assessments.

Productivity Commission (1999)

In its 1999 report, the Productivity Commission used data from the 1999 National Gambling Survey and the Survey of Clients of Counselling Agencies (SCCA) to estimate gambling costs for 1997–98. Adopting a conservative approach, the Commission included only SCCA respondents with a South Oaks Gambling Screen (SOGS) score of 10 or above (47,000 people), instead of the entire estimated population of 293,000 problem gamblers in Australia. This was based on the premise that people seeking treatment were likely experiencing more severe harms (Productivity Commission 1999).

For one-off events, annual estimates were calculated using the average problem gambling lifespan of 8.9 years. The cost analysis was organised into 5 categories:

- financial
- productivity and employment
- personal and family impacts
- crime
- treatment.

Financial costs

In its financial cost analysis, the Productivity Commission (1999) included bankruptcy costs resulting from problem gambling and debts to family, friends, financial institutions and informal lenders like loan sharks where the debt directly resulted from gambling. The annual cost of debt transfers ($26 million)

was based on an average debt per problem gambler ($10,044), using a figure adjusted from SCCA data to reflect sample and question variation.

Bankruptcy costs were determined by applying a fee ($4,000) from the Insolvency and Trustee Service of Australia to the annually reported gambling-related bankruptcies per year (317). The Commission acknowledged potential inaccuracies due to the unique nature of bankruptcy declarations in gambling cases and the frequency of self-declared bankruptcies.

Productivity and employment costs

To calculate productivity and the employment costs of gambling, the Productivity Commission (1999) assessed productivity loss in the workplace and at home, and costs due to job changes. It valued productivity loss using the average weekly earnings ($748 per week, $38,600 per year), multiplying this by the number of problem gamblers reporting workplace productivity loss, resulting in a cost range of $21 million to $51 million annually. The same method estimated home productivity loss, considering 30% of people who gamble were unemployed, leading to an estimate between $7 million and $50 million per year.

For job change-related costs, it used an average unemployment period of 6 weeks and average weekly income to calculate a total annual cost of $24 million. Government unemployment benefit payments ($402 per fortnight for 9 weeks for about half the job changers) contributed an extra $4.1 million. Job search costs, based on an estimated $2357 per person, totalled $13 million annually. Staff training and replacement costs, assumed to be 10% of the employer's annual salary, amounted to $22 million annually.

Crime and legal costs

In assessing the crime and legal costs associated with gambling, the Productivity Commission (1999) quantified theft costs using values of $500 to $3,225 per incident, based on Walker's (1997) figures, applied to instances of gambling-related crime (9,700). This resulted in a cost range of $5 million to $31 million. The costs resulting from police incidents were calculated using the value of each incident ($510) applied to instances reported by people who gamble (6,300) (Dickerson et al. 1998), amounting to a total of $3.2 million annually. Court proceedings, involving approximately 700 people who gamble, were assigned a cost of $8,000 per case, leading to a yearly total of $5.6 million.

For incarceration costs, the Productivity Commission's method involved analysing data from the SCCA, focusing on 6.4% of surveyed people who had served prison time due to gambling. After adjusting for the sample size and assuming a single incarceration within an average 8.9-year period of problem gambling, it estimated 336 gambling-related incarcerations annually. The cost calculation was based on an average prison term of 3.4 months for non-violent crimes, culminating in an estimated annual cost of $5.1 million.

Personal and family costs

In its 1999 study, the Productivity Commission devised a multifaceted approach to quantify the personal and family costs of gambling. This included estimating:

- the emotional distress to immediate family and parents
- the mental health cost of depression, suicidal ideation and attempts
- the financial implications of divorce and separation
- the cost of gambling-related violence.

The methodology involved applying compensation values ranging from $5,000 to $15,000 for minor cases of emotional distress and $30,000 to $50,000 for more severe cases. Acknowledging the issue of uncertainty in attributing causality, the Productivity Commission implemented a 20% reduction in the estimated number of people affected by these personal and family impacts, based on expert consensus suggesting that 15% to 20% of people who gamble might have experienced similar problems even without a gambling issue.

To avoid double counting in cases where impacts overlapped conceptually or tended to co-occur, such as depression and suicidal ideation, the more extreme group was excluded from broader category

calculations. For instance, it omitted figures for divorce and separation from the total number of relationship breakdowns, and the numbers of suicidal thoughts were excluded from those reporting depression.

This methodology extended to calculating the emotional distress costs to immediate family and parents, derived from SCCA data with necessary adjustments for causality and sample representation. The Productivity Commission, after adjusting the remaining cases to account for average family size and the number of parents, estimated a range of potential economic impacts. The calculations considered average family sizes and resulted in a costing range for emotional distress between $756 million and $2.3 billion for immediate family members.

For estimating the financial impact of emotional distress on parents caused by gambling, a valuation ranged between $0 and $5,000. This range was due to setting minimal valuation linked to emotional distress at zero, resulting in an overall estimated cost spectrum for parents that spans from $0 to $666 million.

Depression costs were determined using 2 levels of severity, ‘often’ and ‘always’, after removing overlapping suicidal thought cases, and applying a value range for each category of $5,000 to $15,000, with causality adjustments of a 20% reduction applied. Combining both estimates yielded a total annual cost of gambling-related depression ranging from $231 million to $692 million.

The costs for suicidal contemplation and attempts were also computed, using a value range of $15,000 to $30,000, with extra adjustments for causality and exclusion of overlapping cases. The cost of suicidal contemplation was estimated to be between $120 million and $239 million annually.

A similar method was applied to determine the cost of suicide attempts, with a value range of $30,000 to $50,000 applied, yielding an annual estimate of $70 million to $117 million. It also assessed the impact of suicide on immediate family (multiplied by 2.3 with a cost range of $15,000 to $30,000) and parents (multiplied by 1.8 with a cost range of $0 to $5,000), resulting in estimated costs of $81 million to $161 million for immediate family and ranging from $0 to $21 million for parents.

For relationship breakdowns, the Productivity Commission excluded divorce and separation numbers, adjusted for causality, and then accounted for the affected parties on both sides of the relationship. This methodology was also applied in determining the costs of divorce and separation, multiplying figures according to average household size and incorporating a range for emotional distress per affected person, along with legal and procedural fees. With a compensation range of $5,000 to $15,000, the annual cost of emotional distress due to gambling-related relationship breakdown ranged between $288 million and $864 million.

The same approach was applied to calculate the cost of divorce and separation, where figures were adjusted according to the average household size (3.3 people) and a compensation range of $15,000 to $30,000 per affected person was used. This resulted in an estimated annual emotional distress cost ranging from $126 million to $253 million due to gambling-related divorce and separation. Also, legal and procedural fees were factored in at $1,100 per case, leading to a total annual financial cost of $2.8 million associated with gambling-related divorce and separation.

Finally, the cost of violence resulting from gambling was estimated after adjusting for sampling from the SCCA, the average lifespan of problem gambling, and causality (20% reduction). The annual prevalence rate of violent gambling-related incidents was calculated, and a value range of $5,000 to $15,000 was applied per incident, yielding an annual estimate of between $2.8 million and $8.3 million caused by such violence.

Treatment costs

The Productivity Commission (1999) focused on the financial contributions made by Australian governments towards treatment and counselling services. This involved estimating government expenditure on such services for the 1997–98 financial year (calculated to be $20 million). This estimation was a part of the Productivity Commission’s broader framework, which ultimately led them to report the total annual cost of problem gambling Australia-wide to range from $1.8 billion to $5.6 billion, equating to about $6,000 to $19,000 per problem gambler per year.

Productivity Commission (2010)

In its 2010 report, the Productivity Commission revisited its analysis of problem gambling in Australia, applying a methodology similar to its 1999 study. It updated the 1999 data to align with currently available information, including:

- the prevalence of problem gambling
- demographic shifts
- changes in household income
- inflation rates.

Using the same framework as in 1999, it estimated the social costs of problem gambling to be between $10,000 and $30,000 per problem gambler per year, excluding financial costs. The financial losses of problem gamblers were determined by subtracting the average expenditure of non-problem gamblers from the average spending by problem gamblers, resulting in a total estimated cost ranging from $4.7 billion to $8.4 billion. The Productivity Commission also suggested that reducing the harm experienced by problem gamblers by 10% could yield an average annual benefit of approximately $470 million (Productivity Commission 2010).

Victorian Competition and Efficiency Commission (2012)

In its 2012 study, the Victorian Competition and Efficiency Commission (VCEC) applied a framework similar to the Productivity Commission's 1999 inquiry to assess the cost of problem gambling in Victoria during 2010–11.

The VCEC differentiated between economic costs (affecting resources) and social costs (affecting wellbeing). Economic costs encompassed direct government costs, indirect costs, justice system expenses, business costs and excess expenditure. Social costs related to mental and physical wellbeing.

Data sources included the Victorian Gambling Study (Department of Justice 2009; problem gamblers, Problem Gambling Severity Index [PGSI] 8+) and unpublished Gambler's Help data provided by the Victorian Responsible Gambling Foundation (2017). Lacking Victorian data, the VCEC relied on the Productivity Commission's 1999 National Gambling Survey (regular gamblers) and the SCCA (problem gamblers seeking help). To estimate the costs of harm, it applied the Productivity Commission's (1999) methodology, which multiplies the harm's cost by the number of affected people.

For direct costs, the VCEC provided specific estimates for the Victorian Government, local government and the federal government, unlike the Productivity Commission's broader approach. This included costs for policy, regulation, treatment services, education and research initiatives, amounting to $42.1 million for the Victorian Government and $0.3 to $0.7 million for local government. The federal government's costs, based on projected future spending, were estimated at $1.6 million.

Indirect costs were calculated using Victorian budget data, considering the impact on various human service areas like mental health and child protection ($6 million to $79 million). The cost estimates ranged from a lower figure, assuming 0.05% of problem gamblers report mental wellbeing costs and are as treatable as the general population, to an upper figure, assuming all problem gamblers interact with human services.

Other economic costs followed the Productivity Commission's (1999) methodology, encompassing:

- job changes ($12 million)
- productivity loss unrelated to work ($2 million to $4 million)
- business and workplace productivity losses ($6 million to $39 million)
- bankruptcy ($0.5 million to $6 million)
- bad debt ($3 million to $37 million)
- the cost of theft (transfer costs of $4 to $5 million)
- divorce and separation costs ($1 million).

Costs to the justice system ($26 million) encompassed court costs, police incidents and corrections.

For social and wellbeing costs, the VCEC applied similar methods to the Productivity Commission, including adjustments for causality, the average lifespan of problem gambling and compensation values. These costs, covering impacts on the person who gambles, family members and parents, were estimated at between $400 million and $1.2 billion, with a significant portion linked to the emotional distress of immediate family and parents.

Including the cost of excess spending by problem gamblers (with respect to non-problem gamblers, discussed in more detail below), which was $1.4 billion in 2010–11, the VCEC estimated the total cost of problem gambling in Victoria for that year to be between $1.5 billion and $2.8 billion.

Social and economic impact study of gambling in Tasmania (2011)

The study conducted by the Allen Consulting Group, the Problem Gambling and Research Centre and the Social Research Centre in 2011 evaluated the costs associated with Tasmania's gambling industry, using the PGSI to classify people who gamble into non-problem/low-risk and moderate-risk/problem groups. The methodology aligned with the approaches used by the Productivity Commission in 1999 and 2010, and the South Australian Centre for Economic Studies in 2008.

For prevalence estimates of GRH, the authors referred to the Productivity Commission's 1999 data from the SCCA and provided cost estimates under 3 different scenarios based on the assumption that the prevalence rates of harm apply to all problem gamblers. These scenarios were categorised as narrow (25%), moderate (50%) and broad (75%) approaches, reflecting the varying percentages of moderate-risk gamblers experiencing harm.

The cost categories used mirrored those of the Productivity Commission (1999), encompassing:

- financial costs
- productivity and employment impacts
- crime and legal expenses
- personal and family effects
- treatment costs.

The calculation method involved multiplying the estimated number of people affected by the estimated cost of each harm, with adjustments made for causality, gambling problem lifespan and double counting. Where Tasmanian-specific data was unavailable, the Productivity Commission's 1999 estimates were adapted, adjusting them for 2011 inflation rates.

The cost of GRH was estimated using 3 different approaches. The narrow approach considered all problem gamblers and 25% of moderate-risk gamblers (between $37 and $104 million). The moderate approach accounted for all problem gamblers and 50% of moderate-risk gamblers (between $51 and $144 million). Last, the broad approach included all problem gamblers and 75% of moderate-risk gamblers (between $64 and $184 million).

Notably, 85% to 90% of these costs were linked to personal and family impacts, with emotional distress to parents and immediate family members making up about half of the total costs. But the Allen Consulting Group et al. (2011) noted the difficulty in determining which approach (narrow, moderate or broad) most accurately reflects the true costs associated with moderate-risk gambling.

Other international approaches prior to 2017 (2006, 2008, 2010)

Canada and New Zealand have both tried to quantify the costs related to gambling problems. Anielski and Braaten (2008) in Canada introduced the Socio-Economic Impact of Gambling Framework, which encompasses both benefits and costs of gambling issues across 6 categories:

- health and wellbeing
- economic and financial aspects
- employment and education

- recreation and tourism
- legal and justice
- cultural impacts.

This framework is distinctive in its consideration of cultural costs, like the loss of social cohesion and the impacts on income and employment in other entertainment sectors due to legalised gambling. This approach differs from the Productivity Commission's (1999) analysis, which viewed employment impacts as transfers rather than true costs or benefits.

In New Zealand, research has focused on the broader impacts of gambling problems, particularly on communities, children, older people and different ethnic groups (Centre for Social and Health Outcomes Research and Evaluation 2006, 2008; Wall et al. 2010). But this research did not attempt to apply a methodology to assign a monetary value to these gambling-related impacts.

Assessing gambling-related harm in Victoria (2016)

The previous Victorian economic costing (Browne et al. 2017b) drew heavily from a study by Browne et al. (2016) that created a framework and methodology for assessing GRH. The Browne et al. (2016) project aimed to systematically explore the extent of GRH and evaluate the overall 'burden of harm' in relation to various levels of problem gambling and comparable conditions.

The approach was grounded in public health, specifically employing health state valuation methodology[7] to gauge the impact of gambling harms on people's health-related quality of life (HRQoL). Although not an economic costing, the Browne et al. (2016) report deserves a mention because of its foundational role in quantifying the health impacts of gambling at the population level. This, and similar subsequent efforts to quantify harms in terms of (negative) health utility, are crucial to inform economic costing evaluations.

Browne et al. (2016) developed a comprehensive conceptual framework and taxonomy of harms, categorised into 8 broad domains, and this facilitated a wide-ranging survey on the prevalence of specific harms across different gambling risk profiles. The data gathered was then used to construct descriptive vignettes, which were evaluated for HRQoL impact using established health state valuation protocols such as the time trade-off (TTO), similar to those used in burden of disease studies. The individual harm estimates were aggregated using recent prevalence data and analysed in various dimensions, including domains of harm, PGSI categories, demographics and comparative impact with other health conditions.

The methodology involved several phases of data collection and analysis. After a literature review, a consultative phase involved focus groups, interviews with professionals and people affected by gambling, and analysis of public internet forum posts. Subsequently, a quantitative phase was executed, which included an online harms survey of more than 4,000 people, followed by HRQoL elicitation from 735 participants chosen across the spectrum of impact. These participants provided estimates of HRQoL impact for various condition descriptions derived from the survey. The results yielded expected HRQoL values for each PGSI score, which were then integrated with prevalence data for more analysis.

The outcomes of this research expanded the original 6 domains of harm to 8 and identified 3 temporal categories of harm: general, crisis and legacy. The study concluded that gambling problems impose a significant burden on the Victorian population, comparable to major depressive disorder and alcohol misuse, with a substantial portion of the harm distributed among low-risk and moderate-risk gamblers. This led to a recommendation that policymakers shift their focus from solely preventing 'problem gambling' to mitigating impacts from gambling across a broader range of the spectrum of problems and harm.

[7] Health state valuation is a way of measuring how different health conditions impact a person's quality of life. People are asked to evaluate or compare various health conditions by assigning a numerical value to different health states.

The social cost of gambling to Victoria (2017)

Browne and colleagues' (2017b) report on the social cost of gambling quantified the economic impact of GRH in Victoria in 2014–15, encompassing all severity levels: low-risk, moderate-risk and problem gambling. It built on methodologies from the previously mentioned earlier studies by the Productivity Commission (1999; 2010) and the VCEC (2012) but differed in using updated estimates for prevalence of gambling harm. The project provided a breakdown of the total costs of gambling categorised by type of harm and severity level and compared these costs with those associated with alcohol, tobacco and illicit drugs.

Key methodological assumptions included using an established gambling harm framework encompassing various domains, including (Browne et al. 2017b):

- financial costs
- emotional and psychological impacts
- familial and relationship impacts
- costs associated with crime
- productivity costs
- government costs.

The study considered 3 categories of gambling risk and employed a 3-step process for cost calculation: identification, measurement and evaluation. Costs were calculated using multiple data sources and conservative estimates, adjusted to 2014–15 values using the Consumer Price Index. An average cost estimate was used for each item, opting for lower estimates in situations of uncertainty, and providing a range of low and high estimates only when significant uncertainties impacted the calculations (Browne et al. 2017b).

Efforts were made to avoid double counting by adhering to methods used in previous studies. Also, a 20% counterfactual discount was applied to prevalence figures, aligning with the approaches previously used by the Productivity Commission (1999) and the VCEC (2012).

The estimated total cost of gambling issues in Victoria for the 2014–15 financial year was about $7 billion. This sum was distributed across different levels of gambling risk, with over one-third ($2.45 billion) linked to low-risk gambling, one-third ($2.36 billion) to problem gambling, and one-quarter ($1.9 billion) to moderate-risk gambling.

Costing studies subsequent to 2017

This section focuses on reviewing more recent economic costing of gambling and changes in the landscape since the 2017 *The social cost of gambling to Victoria* report was published.

Fourth social and economic impact study of gambling in Tasmania (2017)

The 'Fourth social and economic impact study of gambling in Tasmania' (ACIL Allen Consulting et al. 2017) aimed in part to quantify gambling harms. The study employed 3 approaches to elicit the impact of gambling on quality of life.

First, a novel discrete choice protocol modelled after the TTO method asks people who gamble and affected others to make trade-offs between longevity and gambling behaviours. In this study, people who gamble were more likely to report a cost than a benefit to gambling. But results of a direct elicitation study that asked how much better or worse gambling has made their life overall, the bulk of people who gamble reported that their lives had been made no better or worse by gambling, while 6.0% said their life had been made better and 1.5% worse. The study concluded that most people who gamble did not experience either large harms or benefits from gambling.

Second, in examining affected others using a direct solicitation method, over half reported that another person's gambling had negatively impacted them with their lives being, on average, 18% worse (benefits were not measured in this study as they were deemed to be negligible). No monetary valuation was undertaken for this study because the focus was purely on utility changes.

Third, the study employed the Gambling Harms Scale 10 (GHS-10; formerly known as the Short Gambling Harm Screen) and the PGSI to calculate disability weights and years of life lost (YLL). Results indicated that in total an estimated 5,531 years of life were lost annually in Tasmania due to HRQoL impacts.

The social costs of gambling harms in the Northern Territory (2018)

'The social costs of gambling harms in the Northern Territory' (Whetton et al. 2018) used 2018 prevalence data to allocate a value to the harm arising from a person's own gambling behaviours and to those close to them. Of the population, 1.4% were classified as problem gambling, 3.6% as moderate-risk gambling and 9.4% as low-risk gambling by the PGSI. At the population level, more than 11,300 people who gamble experienced at least one type of harm resulting from their own gambling, and more than 14,500 people were impacted by another person's gambling.

The total quantifiable costs of gambling ranged between $164.9 million and $381.3 million, with a central estimate of $190.1 million. This value represented total costs of between $9,700 and $22,500 per at-risk gambler (central estimate $11,223).

Harms to at-risk gamblers stemming from their own gambling carried estimated costs of $80.8 million to $158.7 million. The largest contributors to this cost were associated with crime, followed by emotional harm and excess spending on electronic gaming machines (EGMs). The estimated costs arising from harm to others ranged from $84.2 million to $222.6 million. Again, crime-related, and emotional and psychological costs, were the largest contributors to the estimated cost to affected others.

The range between low and high estimates was linked both to the uncertainty around the scale of harms and uncertainty associated with the cost that should be linked to those harms. The overall costs were considered conservative due to harm items that could not be accurately quantified or valued; for example, the calculation did not include impacts on children, or some of the low prevalence impacts, such as bankruptcy and self-harm, or hard-to-value items.

Harms were broadly categorised according to Langham et al.'s (2016) domains:

- financial
- relational
- emotional or psychological
- reduced productivity
- crime-related costs
- physical health impacts
- cultural harm and treatment
- community support costs.

The costing approach was based on the *Social and economic costs and harms of alcohol consumption in the Northen Territory* report (Smith et al. 2019). Low and high estimates for items within each harm category were calculated for all 'at-risk' gamblers and affected others. The costs were calculated based on the number of people impacted multiplied by a low- and high-cost estimate per person.

Crime was valued based on the number of people reporting being a perpetrator or victim of crime and the number of occasions this occurred based on the Smith et al. (2019) report. The costing included calculating a proportion of the total police service costs in the Northern Territory, court and correction system costs, costs to victims of crime, and costs associated with harm minimisation.

Two aspects of work-related harms were valued: absenteeism/presenteeism and loss of employment. Psychological impacts were quantified by mapping individual harms to psychological conditions described in the 2016 Burden of Disease Study and their associated disability-adjusted life year (DALY). For example, the harm 'feeling stressed or anxious' was deemed equivalent to 'mild anxiety disorder' with an associated DALY loss for a year of 0.03. DALYs were discounted by 50% to allow for symptom-free periods of the year. The report used the value of statistical life years (VoSLY) to estimate the value

of DALYs. Excess expenditure was calculated based on the approach developed by the Productivity Commission (1999).

In common with other efforts, this approach assumes that people with gambling problems would spend as much as non-problem gamblers were it not for their problems with gambling. Therefore, any spending above this amount is considered an excess expense. The study included a value for extra spending on EGMs only. The study did not include estimates for other financial harms such as being unable to pay rent or a mortgage.

Fifth social and economic impact study of gambling in Tasmania (2021)

In 2021 the cost of gambling in Tasmania was estimated to be between $48.9 million and $159.6 million (SACES et al. 2021). This cost was categorised into 2 main areas:

- 'externalities' or third-party direct costs
- individual costs – 'internalities' – such as relationship breakdown, depression and suicide.

Relationship breakdown was the largest cost contributor to the estimate, followed by the psychological distress of both the person who gambles and their immediate family.

The study used the Gambling Harm Measure (GHM) (Delfabbro et al. 2020) to assess harm, broadly categorising these harms as per Langham et al. (2016). The GHM is a measure that assesses aspects of harm and their relative severity using the categories of 'over-prioritisation', 'pressures and strains' and 'severe harms' – the latter 2 being seen as more 'genuine' harm. These genuine harms were moderately common in those categorised by the PGSI as moderate-risk gambling (particularly financial, psychological and health-related harms) and more common in those classified as problem gambling (financial, psychological, health-related and relational harms). For the costing, harm items that were not directly measured in the 2020 Tasmania prevalence survey were taken from the Productivity Commission (1999) and weighted to reflect the Tasmanian prevalence of problem gambling compared with the 1999 national prevalence. Similarly, costs that could not be sourced were also drawn from the 1999 prevalence survey, with updated values.

Using a similar method to that used in the 2018 Northern Territory costing to calculate HRQoL decrements, psychological harms were mapped to corresponding psychological conditions calculated by the Global Burden of Disease Collaborative Network. For example, 'psychological strain or distress' was mapped to 'mild anxiety disorder'. The associated DALY was discounted by half, assuming these symptoms would only have measurable impact half the time. The associated cost of this DALY was taken from Abelson (2008) and the Community Affairs Reference Committee (2015). Some aspects of the estimate were presented as being conservative due to potential under-representation of harms such as those associated with violent crime, particularly intimate partner violence. Also, some other factors, such as costs associated with suicide, were not included.

Understanding the cost of addiction in Australia (2022)

KPMG and Rethink Addiction (2022) estimated the costs associated with GRH in Australia by integrating the results of 4 existing reports (The Allen Consulting Group et al. 2011; Browne et al. 2017b; Productivity Commission 1999; VCEC 2012). The costing included tangible costs as well as intangible costs such as quality of life decrements.

Tangible costs associated with gambling addiction were valued at $10.7 billion, with about half ($5.4 billion) linked to harmful consumption (gambling losses) and smaller amounts included for productivity-related losses (at home and in the workplace), social service costs, justice and law enforcement costs and family and others. Intangible costs were $7.3 billion, comprising losses related to pain and suffering and HRQoL decrements derived from Browne et al. (2017b). Healthcare-related costs were not included in the total.

The costing was calculated from a small number of existing studies and does not detail the exact methodology. Therefore, it is unclear whether these costs are related to those categorised as problem gambling (as used in the 2012 Victoria Study), moderate-risk and problem gambling (The Allen

Consulting Group et al. 2011) or across the risk-spectrum (Browne et al. 2017b), or in what way affected others were considered in the calculation.

Social costs of gambling in the Czech Republic 2012 (2017)

This 2017 study is a retrospective, prevalence-based cost of illness study that aimed to estimate the social costs of gambling in the Czech Republic (Winkler et al. 2017). The study took a societal perspective in calculating costs. It used the Australian Productivity Commission's (1999, 2010) framework as a basis. But it made some adjustments, such as only including costs linked to those categorised as 'problem gamblers' rather than all people who gamble experiencing any level of harm.

The total costs were estimated to range between €541,619 and €619,608, (between $931,994 and $1.1 million AUD) and with personal and family costs accounting for the largest proportion (63%). Other costing categories were health and social care costs (treatment), financial (bankruptcy), productivity losses (workplace of household work losses), unemployment costs and crime and legal costs. Personal and family costs included intangible costs associated with depression as well as emotional costs for parents and immediate family, costs associated with relationship breakdown, divorce, violence, suicidal thoughts, and attempted suicide. These were based on costs from the Productivity Commission reports (1999, 2010).

Some costs were discounted by 20% to account for unclear causality. Other costs (like debt recovery and costs of divorce on children) were intentionally excluded due to a lack of reliable data.

The societal costs of problem gambling in Sweden (2020)

Hofmarcher et al. (2020) estimated the societal costs of gambling in 2018 in Sweden using a prevalence-based cost-of-illness approach. This approach estimates the cost associated with gambling over a single year. The analysis drew on a national survey to estimate the number of people negatively impacted by gambling across the full spectrum of gambling risk levels as assessed by the PGSI. Costs spanned people who gamble as well as affected others living in their households.

The study took a broad perspective, categorising costs into direct costs (for example, healthcare and legal costs), indirect costs (for example, lost productivity) and intangible costs (for example, reduced quality of life). Conservative causality adjustments of either 20% or 50% were applied to many of the cost categories to account for comorbidities.

In total, the Hofmarcher et al. (2020) report estimated the social cost of gambling in Sweden to be €1.42 billion ($2.4 billion AUD) annually. Indirect costs accounted for 59% of this, followed by 28% intangible and 13% direct costs.

The study included a wide range of cost impacts including the costs of:

- treatment (including services provided by non-profits)
- regulation and research
- debt counselling and management
- crime
- divorce
- unemployment
- emotional distress
- violence
- suicide.

Most costs were calculated using a bottom-up approach, with the number of affected people who gamble (or their household members) multiplied by an average unit cost.

Intangible quality-of-life decrements represented a substantial cost category. This category valued the negative impact of emotional distress and exposure to violence on quality of life for both people who gamble and their household members. The prevalence of factors like mental illness, suicide attempts, unemployment and separation were used to estimate the number of people who gamble experiencing

emotional distress events. The study assumed that all household members of these distressed people who gamble would also be impacted. With no other monetary valuation method available, the calculation applied Sweden's average crime victim compensation payment of €2,250 ($3,873 AUD) per incidence as a proxy value for emotional and physical harm.

The report accepted that the use of an average compensation payment might be seen as a compromise approach to quantifying the considerable yet difficult to monetise burden of reduced wellbeing. A key limitation noted by the authors was the lack of a standardised, gambling-specific methodology for valuing such harms. Despite this, including intangible costs based on reasonable proxy valuations helps capture a fuller economic picture of the impact of gambling harm. While a broad range of costs was included in the costing, only household affected others were considered and, while they are most likely to be impacted, this method does not include distress to ex-partners or another close family outside the household.

Social costs of gambling harm in Italy (2022)

Lucchini and Comi (2022) assessed the social costs of gambling in Italy by taking a cost-of-illness approach. The report focused on public finance impacts, estimating both direct treatment costs and indirect costs including:

- productivity losses
- unemployment
- suicide costs
- legal issues
- personal and family costs (specifically separation and divorce).

The study incorporates high-risk and at-risk gambler populations identified using PGSI and SOGS screens.

Most direct costs used calculations with top-down expenditure data, and for the indirect costs, bottom-up use figures were paired with unit costs. The costings were discounted by 20% to address causality limitations. There were significant data gaps that prevented the inclusion of all cost areas and groups; thus, the authors acknowledge the results underestimate total societal impacts. For example, HRQoL impacts were not calculated due to measurement complexities.

The report found over €2 billion ($3.4 billion AUD) in annual costs associated with gambling, mainly driven by unemployment, lost productivity and legal issues. Although substantial, the costing excludes private costs as well as many indirect societal costs, including those affecting low-risk gamblers and affected others.

The fiscal costs and benefits of problem gambling: Towards better estimates, United Kingdom (2023)

This report estimated the benefits and costs of gambling in the United Kingdom (Bhattacharjee et al. 2023). The total cost linked to problem gambling was £1.4 billion per year (or within lower and upper bounds of approximately £1.1 billion and £1.7 billion per year). This corresponds to $2.9 billion AUD, with a lower bound of $2.3 billion and an upper bound of $3.5 billion AUD.

The report used the population-representative Wealth and Assets Survey in the UK. Categories for the costing were based on Wardle et al. (2018) harm categories of healthcare spending, welfare support, housing needs and incidence of crime. These costs were calculated by first identifying statistically significant associations between people categorised as problem gamblers on a *Diagnostic and Statistical Manual of Mental Disorders*, fourth edition (DSM-IV) screen, and the use of specific public services, such as hospitals and criminal-related services like courts and the police system. For example, costings were based on findings that people experiencing problem gambling were 9 times more likely to need hospital-based treatment than 'at-risk' gamblers.

The costs associated with those categorised as problem gamblers were then compared with 'at-risk' gamblers, rather than those without gambling problems, as the 'behavioural profile of these 2 categories

of people who gamble is more similar than the behavioural profile of the general population who are largely 'non-gamblers'. But the report accepts that this approach underestimates the costs.

Using this methodology, the cost for each person categorised as a problem gambler was calculated at approximately £3,700 ($7,580 AUD) per year (compared with people experiencing 'at-risk' gambling). Most of this cost is linked to welfare support (benefits payments), health care (hospital and general practitioner visits for a mental health complaint), criminal justice costs and homelessness support. This per-person cost was deemed a conservative 'minimum' estimate of 'core costs' as many factors, such as costs associated with suicide, debt, family breakdown, non-direct-cost HRQoL, costs related to the charity sector, or costs linked to affected others, were not included.

Three years of prevalence data was then used to estimate the number of people experiencing problem gambling. The total economic cost was based on an estimate that people with severe gambling problems are approximately 0.7% of the population, or around 380,000 people (aged over 15 years). A 95% confidence interval was applied to the total number of people experiencing problem gambling, resulting in upper and lower bounds associated with the costing.

The economic and social cost of harms associated with gambling in England (2023)

An analysis by the Office for Health Improvement and Disparities (2023) updated a 2021 report on the economic and social costs of gambling harm in England. The results showed the annual direct financial costs to the government (£412.9 million; $846 million AUD) associated with harmful gambling and the wider societal health costs (£635 to £1,355.5 million; $1.3 to $2.8 billion AUD). These costs were presented as a range to deal with uncertainty around many non-direct costs. The authors consider this to be a conservative estimate, as it does not include, or only partially includes, factors such as:

- impacts to affected others
- financial harms (such as excess spending or financial distress)
- quality of life impacts beyond depression
- healthcare costs associated with suicide attempts
- costs related to crime
- relational harms
- cultural harms.

This costing covers gamblers across the PGSI, including at-risk and problem gambling populations. Financial costs include homelessness services, unemployment benefits, imprisonment and health care. Health costs valued in this report were YLL from excess suicides and HRQoL impacts of excess depression cases.

The analysis estimates excess cases associated with harmful gambling by first calculating the expected number of cases in this population if they had the same rate of outcomes as non-problem/non-gamblers. This expected number is subtracted from the actual number expected based on increased relative risks, giving excess cases associated with elevated gambling. These intangible valuations use the standard government amounts for societal quality-adjusted life years.

The study underestimated the total costs by not including significant costs, such as those associated with financial harm, losses associated with irrational spending or direct impacts to HRQoL (for either people who gamble or affected others). Several recommendations were made to address those evidence gaps, such as improving data on financial harms and quantifying the HRQoL impacts on affected others.

Other critical evaluations of economic costing studies

Two articles (Latvala et al. 2019; Patel and McDaid 2019) focused on outlining proposed methods or models that may be used to assess the economic impact of gambling.

Latvala et al. (2019) identified several methodological deficiencies that potentially introduce bias in quantifying the costs associated with gambling harm.

One key limitation identified in many costings was in quantifying the social impacts. While economic impacts are straightforward (that is, the cost of treatment), social costs (such as distress) are non-monetary and difficult to cost, and consequently often ignored. But these non-monetary costs cover significant emotional, health, relationship and other harms experienced across all levels of impact.

Another issue is that most research ignores both monetary costs and non-monetary costs along the gambling continuum – for example, not including costs for emotional distress in people with less severe gambling problems.

Also, harms to affected others are often excluded from these costings, which results in them omitting a substantial proportion of total potential costs.

Finally, longer term societal costs are also overlooked, such as the increased need for social services and generational impacts on children.

These methodological issues result in an underestimation of total societal costs.

The authors proposed a public health impacts of gambling (PHIGam) approach as a conceptual model to provide a common methodology for assessing the social impact of gambling harm. The model aimed to address the methodological limitations in the field to enable more valid and comprehensive societal cost estimates. A public health approach to assess the impacts was recommended, including covering the full spectrum of gambling harm rather than just focusing on problem gambling.

The model organises the costs into 3 main categories – financial (changes in financial situation), labour (impacts on work such as absenteeism and reduced performance) and health/wellbeing (impacts on physical, psychological and social health and wellbeing). All these impacts can manifest at the personal, interpersonal and societal levels. Within each area, impacts can be negative or positive; for example, legal gambling can increase some aspects of criminality but decrease illegal gambling. Also, temporal aspects are also accounted for, including long-term costs such as changes in the life course of those who once had severe gambling problems and ongoing intergenerational impacts.

Latvala et al. (2019) argue that many gambling impact analyses are too narrow, focusing only on the monetary costs of problem gambling. The proposed conceptual model instead suggests a more holistic public health framework that measures financial, labour, health and wellbeing costs manifested across people, interpersonal relations and society more broadly. It advocates quantifying non-monetary social impacts and longer term costs incurred across the full gambling behaviour spectrum while also including any positive non-monetary benefits.

Patel and McDaid (2019) offer a method for evaluating the costs associated with gambling harms as well as determining whether interventions provide good value. A key emphasis is on taking a broad societal perspective, capturing costs across all sectors rather than just those impacting public budgets. The steps outlined in producing an economic costing are:

- identifying all relevant inputs and impacts
- quantifying them
- attaching appropriate monetary values.

The paper categorises costs into direct, indirect and intangible.

Direct costs are those incurred by the person who gambles, affected others, services and the private sector (such as employers). Indirect costs are described as secondary-level costs, such as costs associated with work absenteeism or poor performance for both the person who gambles and affected others. Intangible costs are more difficult to quantify, such as relationship breakdown and unpaid childcare by family members. These manifest on personal (individual gambler), interpersonal (family, friends) and societal levels.

An illustrative model for Great Britain within the paper shows how costs can be estimated spanning health care, criminal justice, financial problems, unemployment, relationship breakdowns and lost quality of life.

The paper notes methodological challenges in estimating and interpreting costs; these include the attribution of harms to gambling given comorbidities, data limitations regarding causality and long-term impacts, subjectivity in social cost valuation and whether the benefits associated with gambling should be included. It also stresses the importance of transparency regarding assumptions that are necessary components of economics costings.

Summary of costing studies

The economic costing studies of gambling have both commonalities and points of difference across key methodological aspects. An overall theme is the substantial contribution to cost estimates (when included) of intangible, non-financial impacts like emotional distress and diminished quality of life, reflecting gambling's widespread psychosocial consequences.

The approaches used to quantify these costs vary, including disability weights, YLL and valuations based on factors like crime victim payments when condition-specific data is lacking. Most of the analyses take a conservative stance in causal attribution and use the Productivity Commission's (1999) approach of applying reductions, usually 20%, to avoid overestimating attributions directly linking the issues to gambling behaviours.

The scope of included populations differs somewhat across studies. Some focus exclusively on those with severe gambling problems, while others take a public health perspective that also incorporates lower gambling severity levels. Similarly, some costings only include harms to individual people who gamble alone, excluding affected others, while others include a limited group of affected others (such as only household members), and others include a more comprehensive estimate of harm to others.

Many reports acknowledge a relatively high level of uncertainty in the costings, and some reflected this by using upper and lower bounds when providing monetary figures (Bhattacharjee et al. 2023; Office for Health Improvement and Disparities 2023; SACES et al. 2021; Whetton et al. 2018; Winkler et al. 2017). But most reports also indicated that they likely underestimated the total costs even within these bounds. This underestimation is due to either:

- missing data (particularly in low prevalence impacts such as suicide)
- data constraints regarding causal pathways
- non-tangible costs that are difficult to place a monetary value on
- methodological choices in not including some costs, such as impacts to affected others, or impacts to people who gamble across all levels of harm.

Also, legacy impacts over the life course, intergenerational impacts and broader societal effects have generally not been considered within any costings.

Key issues around gambling harm

This literature review now discusses recent changes in the higher cost items in the 2017 *The social cost of gambling to Victoria* costing (Browne et al. 2017b).

The prevention paradox

The concept of the 'prevention paradox' (Rose 1981) suggests that a large number of low-risk people incurring modest harm can collectively lead to a greater total impact than the more severe harm affecting fewer people. Evidence of this phenomenon has been mounting in gambling research, which indicates that while severe gambling problems affect a smaller portion of the population, the bulk of gambling's societal harm actually arises from the far larger group experiencing lower levels of harm (Browne and Rockloff 2018; Canale et al. 2016; Volberg et al. 2022). As an illustration, Table A1 outlines recent studies using various approaches to measuring aggregate harm or HRQoL consequences at the population level. The population-level contribution of those with severe gambling problems ranges from 15.2% to 36.5%, with the bulk of the contribution linked to those with less severe problems. Although there is some variation across studies and methodologies, the consolidated data indicate that the collective effects of gambling are spread throughout different levels of severity, with a larger proportion of the impacts being credited to categories beyond problem gambling.

Table A1: Contribution to population-level harm by PGSI category

PGSI category				Measure	Area	Reference
NPG	LR	MR	PG			
*	50.2%	34.5%	15.2%	HRQoL (direct: TTO/VAS)	Australia (Victoria)	Browne et al. 2016
*	25.5%	38.0%	36.5%	Harms (distribution of 1+ social harms)	United Kingdom (National)	Canale et al. 2016
*	48.0%	33.6%	18.4%	HRQoL (direct: TTO/VAS)	New Zealand	Browne et al. 2017a
33.2%	19.1%	24.7%	22.0%	Count of Harms	Australia (panel survey)	Browne and Rockloff 2018
*	45.5%	36.8%	17.7%	HRQoL (direct – based on Browne et al. 2016)	Australia (ACT)	Paterson et al. 2019
*	14.6%	52.6%	32.8%	HRQoL (indirect)	Australia (Victoria)	Browne et al. 2022
18.5%	23.7%	32.5%	25.2%	HRQoL (indirect)	Australia (National)	Tulloch et al. 2024

* Proportion is structurally zero, that is, assumed to be zero by the methodology used.

Table reproduced with permission (Tulloch et al. 2024).

NPG = non-problem gambler, LR = low-risk gambler, MR = moderate-risk gambler, PG = problem gambler

Acknowledging that gambling harms are spread across the spectrum, it is crucial to quantify the costs associated with this harm across all levels of problem severity.

The social cost of gambling to Victoria report (2017) did so and found a significant proportion were linked to gamblers categorised by the PGSI as low- and moderate-risk gambling. In their conceptual model, Latvala et al. (2019) recommends applying the methodology of including all levels of gambling problem severity when quantifying the cost of gambling harm. This methodology has been used in costings conducted in the Northern Territory (Whetton et al. 2018) and internationally (Hofmarcher et al. 2020; Lucchini and Comi 2022; Office for Health Improvement and Disparities 2023).

By contrast, research from Tasmania (SACES et al. 2021) considered only those who suffered 'genuine' harms, which were found among some moderate-risk people and more commonly among problem gamblers. Other recent international studies include only those with severe problems (Bhattacharjee et al. 2023; Winkler et al. 2017).

There has been some criticism of including low- and moderate-risk gambling potentially inflating harm estimates (Delfabbro and King 2017). But, while estimates of impact across the spectrum depend on methodology (Table A1), there is a lack of empirical evidence to support the contention that impacts at the lower end of the spectrum are nil or negligible.

On the other hand, recent research using a variety of elicitation protocols shows impacts across the risk spectrum for people who gamble (McLauchlan et al. 2020; Murray Boyle et al. 2021, 2022) and affected others (Tulloch et al. 2023c). While the impacts tend to be much weaker for lower risk gambling, these people are much more numerous in the population than those with severe problems (Browne and Rockloff 2018).This means that at the population level, when assessing negative impacts associated with gambling (whether they be harm, health and wellbeing consequences, or social and economic costs) we should not restrict our attention to only those who experience severe problems. This reinforces the need for comprehensive economic analyses encompassing all harmed people who gamble to properly capture economic costs.

Health-related quality of life

The largest component of the costing in the 2017 *The social cost of gambling to Victoria* report was the intangible costs associated with emotional and psychological harm to people who gamble and affected others. This aspect of the costing drew on the study by Browne et al. (2016) described earlier in this report. Since this time, there have been advances in how HRQoL decrements can be estimated and costed.

Direct and indirect elicitation approaches

For example, a series of New Zealand studies (Browne et al. 2017a) used a similar method as employed by Browne et al. (2016) to identify HRQoL decrements associated with the PGSI. The methodology used to calculate QALY involved an online survey completed by 1,542 New Zealanders negatively impacted by gambling. They filled out checklists on 83 potential harms, the PGSI and other measures. Then, those reported harm experiences were turned into basic descriptions to use as stimuli for TTO and visual analogue scale (VAS) HRQL elicitation. These 552 descriptions across all PGSI categories were reviewed by 324 professionals and community members who rated how much these situations reduced someone's quality of life. HRQoL utility weights were then derived for each PGSI score and combined with prevalence data.

The analyses identified average HRQoL decrements of 0.18 associated with low-risk gambling, 0.37 associated with moderate-risk gambling and 0.54 associated with problem gambling. At the population level, this finding suggested that the proportion of gambling harm in New Zealand can be attributed as 48% to low-risk, 34% to moderate-risk and 18% to problem gambling. The report found that, when considering both severity and prevalence, gambling causes over twice the amount of harm as chronic conditions such as osteoarthritis (2.1x) and diabetes (2.5x).

While commonly used, the direct method (TTO/VAS) applied in both aforementioned studies (Browne et al. 2017a; Browne et al. 2016) may have some degree of upward statistical bias (Browne et al. 2022). Nevertheless, in terms of the total magnitude of HRQoL for higher severity labels, there appears to be a high degree of consistency across samples (for example, New Zealand versus Australia) and protocols (for example, TTO, VAS, condition ranking and expert evaluation of vignettes). But given the potential for small errors or bias at the lower end of the spectrum to have an outsize impact on costing, given their far larger prevalence, it is crucial to employ the best possible estimate of the 'HRQoL/gambling severity' curve.

Browne et al. (2022) introduced a new methodology to evaluate GRH from a public health standpoint. The primary objective was to devise robust tools and methods that are applicable in both population surveys and detailed research settings. Their approach positions GRH within a spectrum of negative outcomes affecting individual health and quality of life, distinguishing it from behavioural addiction. This methodology incorporates statistical analyses to regress symptoms of GRH on declines in HRQoL, considering comorbidities and demographic factors to reduce subjective bias (Browne et al. 2022).

The study also involved benchmarking 2 main instruments for evaluating GRH – the PGSI and the GHS-10 – against standard health utility metrics including the 6-dimensional health state short form (SF-6D) (Browne et al. 2022). Using data from a sample of more than 2,600 people who gamble and affected others, the study showed that as GRH intensity increased, there was a significant decrease in health utility among the participants for non-zero GHS scores. The outcome of the research represented a way to transform GRH (as measured by the GHS instruments) to health utility, which is arguably the optimal metric with which to quantify the impact of gambling on HRQoL.

An essential contribution of this research was the development of the 20-item Gambling Harms Scale (GHS-20), an expansion of the GHS-10, encompassing a wider array of harm domains and subjected to similar health utility benchmarking (Browne et al. 2022). To address the impact on affected others, the study introduced corresponding versions of the GHS-10 and GHS-20 (GHS-10-AO and GHS-20-AO), thereby broadening the scope of GRH measurement. The reliability and effectiveness of the new measures were also validated through qualitative interviews with both people who gamble and affected others at various levels of harm (Browne et al. 2022). These interviews provided empirical evidence of a graded increase in harm severity, as reflected in the rising scores on the GHS scales. Also, expert

analyses of narrative accounts gathered from these interviews reinforced the scales' credibility, with more severe harm bands clearly associated with larger decrements in health and wellbeing.

There is now a validated measure of harm for people who gamble and affected others (GHS-10/GHS-10-AO) that is directly linked to HRQoL decrements that uses the alternative approach of indirect elicitation to calculate these decrements (Browne et al. 2022). This method involves estimating the link between symptoms of GRH and reductions in health utility (measured via instruments such as the SF-6D and WHOQOL-BREF) via statistical analysis. The approach includes control for potential confounds that can increase the risk of experiencing both harm and poor HRQoL (for example, socioeconomic indicators), and propensity score weighting is applied to ensure a robust comparison between those gambling with and without harm symptomatology.

Because the inference of causality is made by statistical inference, the approach is inherently immune from subjectivity or attribution bias. But the absolute magnitude of the decrements cannot be easily interpreted because of the conservative methods and restriction of range/sensitivity effects in the outcome measures. For example, health utility measures such as the SF-6D have been developed for a focus on biological health and physical functioning (Brazier and Roberts 2004). Gambling harms, on the other hand, encompass a much wider range of impacts (Browne et al. 2016; Langham et al. 2016). Even the most severe gambling problem is unlikely to impact a person's ability to climb a flight of stairs or impact bodily pain. Consequently, these types of measures may not be able to adequately identify the total magnitude of health and wellbeing decrements associated with gambling problems (Browne et al. 2017; Moore et al. 2024).

Given this, direct and indirect elicitation methods have complementary strengths and weaknesses. The consensus estimate of direct approaches regarding the maximum amount of HRQoL due to gambling yields a scaling factor that is consistent with community attitudes and expert opinion. The indirect approaches yield relative decrements across the spectrum of symptomatology, as measured by the GHS measures included directly to population studies. So, in our view, the strengths of both approaches can be realised by scaling the GHS (indirect) decrements with respect to the consensus direct estimate for the most severe degree of harm.

Application of the HRQoL estimates to economic costings

An analysis of a recent large (n = 15,000) Australian prevalence study (Tulloch et al. 2024) used the published decrements associated with the GHS-10 (Browne et al. 2022) as a basis for understanding the national impact of gambling harm on HRQoL. The study found that the greatest aggregate HRQoL impacts at the population level were among lower risk gamblers. In this study, the average SF-6D decrement per person was 0.152 for those categorised as problem gamblers, 0.080 for moderate-risk gamblers, 0.027 for low-risk gamblers and 0.003 for non-problem gamblers (who still reported some harm).

Considering the prevalence in the population, this equated to 32,024 YLL for problem gambling, 41,313 for moderate-risk gambling, 30,075 for low-risk gambling and 23,537 for non-problem gambling. This finding of a contribution of impact across the spectrum of gambling problems due to balancing out the influence of high/low prevalence versus low/high severity is consistent with a growing literature on the prevention paradox in gambling. As seen in the above examples, different methods have been used to elicit HRQoL decrements, resulting in some variability within actual findings. But, overall, these methods result in similar patterns within the findings, where HRQoL decrements increase markedly as the severity of the gambling problem increases.

The recent economic costings have used a variety of methods for placing a monetary value on HRQoL. In the Northern Territory costing (Whetton et al. 2018), quality of life impacts were quantified using DALYs. These were identified by linking the relevant reported harms to decrements calculated in the 2016 Global Burden of Disease Study (for example, 'felt depressed' to 'moderate anxiety disorder'). They were then discounted by 50% to allow for symptom-free periods. Costs were allocated to each of these DALYs using a commonly used tool that places a value on one extra year of life (VoSLY). Upper and lower bound estimates were given to each line item to account for variances in methodologies used to calculate VoSLYs. Tasmania (SACES et al. 2021) used a similar process, mapping known harms to DALYs and costing via VoSLYs. The National Australian Cost of Addiction study (KPMG and Rethink

Addiction 2022) used HRQoL decrements derived from Browne et al. (2017b) but did not specify how this figure was calculated.

A study in Sweden valued the emotional distress of people who gamble and affected others living in the same household by calculating the prevalence of experiencing emotionally distressing events (mental illness, unemployment, separation) (Hofmarcher et al. 2020). They then used an amount associated with crime victim compensation as a proxy value for this harm.

In England (Office for Health Improvement and Disparities 2023), HRQoL costs were valued as YLL associated with excess suicides and depression for people who gamble, and standard government valuations were used to value these decrements.

The Czech Republic (Winkler et al. 2017) calculated HRQoL only for people categorised as 'pathological gamblers'. The study used estimates provided by expert physicians who estimated that between 13.3% and 23.3% of their (gambling-related) patients suffered from clinically significant depression. This was then valued using a Czech Republic source, which calculated the average cost per patient with depression.

The United Kingdom (Bhattacharjee et al. 2023) did not consider HRQoL (outside direct costs for mental health visits to GPs), nor did Italy (Lucchini and Comi 2022). Overall, while many of the more recent costings have included a value for HRQoL, they have not always included this for affected others, nor across the full spectrum of gambling harm.

The previous *The social cost of gambling to Victoria* report (2017) assessed HRQoL using 2 methods. For people who gamble, costs associated with suicide and depression were calculated by determining the prevalence of these issues and adjusting the figures to account for uncertain causality. These costs were then quantified using the standard compensation amounts for victims of crime. Also, for other emotional/psychological costs, the study employed disability weights (established in Browne et al. 2016) to calculate DALYs. These DALYs were then assigned costs based on the per capita GDP. For affected others, the emotional distress resulting from violence and suicide was evaluated based on the number of people impacted. This number was estimated based on whether they lived in the same household (in cases of violence) or using total numbers affected as per Goodwin et al.'s (2017) findings (for suicide and other emotional distress). The costs for these impacts were then estimated using the victims of crime compensation amounts as a proxy.

Impacts to affected others

Impacts to affected others comprised a large part of the 2017 Victorian costing. Since this time, there have been significant advances in understanding the number of people impacted and more about the exact nature and health and wellbeing consequences of this harm.

The number of affected others in the 2017 social cost of gambling report was imputed from Goodwin et al. (2017), who calculated that each case of problem gambling would typically impact 6 others; moderate-risk gambling 3 others; and low-risk gambling one other person. A recent national Australian prevalence study (Hing et al. 2022) found another person's gambling had negatively impacted 6% of Australians within the previous year. A nationally representative study (Tulloch et al. 2023c) identified the proportion of Australian adults living in the same household as other people participating in low-risk gambling (3.5%), moderate-risk gambling (1.9%) and problem gambling (0.9%). Another Australian population study (Tulloch et al. 2022) identified that approximately 0.9% of 12-year-old children in Australia have a parent categorised as a problem gambler, 3.2% as a moderate-risk gambler and 4.7% as a low-risk gambler. Slightly higher proportions were found in the cohort of 16-year-old children; 1.6% had a parent who was classified as a problem gambler, 3.8% as a moderate-risk gambler and 7.2% as a low-risk gambler.

Harm can be experienced across a range of affected others, not only current partners or those in the same household (Hing et al. 2022; Tulloch et al. 2023a; Tulloch et al. 2021). For example, recent Australian studies have shown that former or ex-partners report the most significant number of harms and the highest amount of distress when compared with other relationships to the person who gambles (Hing et al. 2022; Tulloch et al. 2023a).

There is also evidence that harm can occur across the spectrum of harm (Tulloch et al. 2023c) and can continue after the gambling problem has been resolved (Rockloff et al. 2022c). Longitudinal evidence indicates that affected others living in the same household as someone with a gambling problem experience a decline in their social and financial wellbeing over time (Tulloch et al. 2023b).

The recent Australian economic costings have used differing approaches to attribute costs to affected others. *The social costs of gambling harm in the Northern Territory* report (Whetton et al. 2018) included costs to affected others, which, due to the higher prevalence of affected others than people who gamble reporting harm, resulted in a higher overall cost linked to another person's gambling than from a person's own gambling.

The Northern Territory report covered a broad range of harms to affected others: emotional and psychological harms, work/study-related impacts, relational and family harms, and criminal activity. The study included the full range of affected others identified from a prevalence study where they had endorsed being impacted by harm from another person's gambling. For this costing, affected others were not apportioned across gambling severity; rather, a single low/high value was allocated to all those who reported harms linked to another person's gambling.

The 'Fifth social and economic impact study of gambling in Tasmania' (2021) included limited impacts to 'immediate family' only. Two areas of harm were costed for affected others – relationship breakdown and emotional distress. Relationship breakdown was calculated by doubling the number of those who gamble impacted. Emotional distress was costed based on an estimate of the number of family members of problem gamblers experiencing distress, sourced from the Productivity Commission (1999).

In the international costings, Sweden (Hofmarcher et al. 2020) included emotional distress costs for all other household members of people who gamble across the range of problem severity. The Czech Republic (Winkler et al. 2017) included emotional costs for parents and immediate family. The relevant proportion deemed to be impacted was derived from a survey question that asked those categorised as pathological gamblers whether their gambling was affecting their immediate family, including parents. Less than half (48.2%) reported that it had. In the other costings covering the United Kingdom (Bhattacharjee et al. 2023), England (Office for Health Improvement and Disparities 2023) and Italy (Lucchini and Comi 2022), costs associated with affected others were not included.

There is now a greater understanding of harm experienced by affected others and how these harms impact health and wellbeing. A nationally representative study of affected others who had experienced negative impacts from another person's gambling in the previous 12 months found the most commonly reported harms experienced by affected others in Australia are emotional, relational, financial, health and vocational (Hing et al. 2022). Emotional harms (feeling distress, depression and anger) were the most commonly reported harms across all relationship types (partner, family and non-family), with almost 90% of affected others experiencing at least one emotional harm. Around three-quarters of the affected others (76.2%) experienced negative impacts on their relationship, which was higher for partners (83.9%) and family members (82%). Financial impacts were more common in partners (80.5%) than family (45.1%) or non-family relationships (40.4%). Health impacts, such as stress-related health problems or lack of sleep due to stress about the gambling problem, were experienced in around half of the partners (51.0%) and slightly lower proportions of family (45.7%) and non-family relationships (30.4%). Negative work or study impacts (that is, reduced performance and using their work time to attend to issues due to gambling problems) were reported by 39.6% of partners and around a quarter of family (25.5%) and non-family relationships (26.8%).

Another study found evidence of work/study productivity loss for affected others, particularly partners (current and prior) and close family members (Tulloch et al. 2023a).

Combining direct and indirect estimates of HRQoL impacts to affected others

Accepting that affected others exposed to gambling problems across the spectrum of harm contribute non-negligible components of population-level impact, the next critical step is to understand to what extent this impacts their HRQoL. Recent work by Browne et al. (2022) was the first to quantify the degree of harm impact on affected others' health and wellbeing. The study included the development of

2 harm-to-AOs measures (GHS-10-AO and GHS-20-AO). These scales were designed with reference to health utility and employed an indirect or statistical methodology to identify health decrements.

Health utility decrements showed increasing impacts as the number of reported harms increased. For the GHS-10-AO, these ranged from 0.019 for one reported harm, 0.076 for 5 harms and 0.115 for 10 harms. These decrements are lower than those experienced by people harmed by their gambling, but affected others are more prevalent, leading to a potentially larger population-level impact.

However, it is important to note that the scale (or absolute magnitude) of these estimated decrements is strongly influenced by the elicitation protocol used. In the case of the SF-6D, it is a measure that allocates a large component of HRQoL to physical functioning and mobility. Since these components are typically unaffected by financial, relationship or other issues associated with exposure to gambling problems, regardless of how severe, it effectively places a relatively low maxima on measurable gambling impacts.

Browne et al.'s (2022) indirect statistical methods are likely to be the most sensitive and conservative with respect to the GHS instruments. For conversion to DALYs or QALYs for the purpose of costing, HRQoL estimates derived via direct elicitation approaches should be scaled with respect to the consensus or median upper bound estimate of all appropriate elicitation protocols. In other words, it should include both direct and indirect methods.

In conclusion, growing evidence shows that affected others can experience considerable harm due to someone else's gambling, and new estimates for HRQoL effects provide a means to quantify it. The impacts occur across a range of affected others and gambling problem severity, and they span financial, relational, emotional, health, work and social domains. Prevalence estimates indicate the number of people negatively affected by someone else's gambling exceeds the number of people who gamble. The cumulative burden and associated costs of these harms are therefore likely to be significant. This result was seen in the recent Northern Territory costing, which involved a relatively comprehensive approach to incorporating costs for affected others and found that the economic impacts linked to affected others comprised a significant proportion of the total costs – greater than that linked to people who gamble.

Financial opportunity costs

Financial opportunity costs are another large line item from the 2017 *The social cost of gambling to Victoria* report (Browne et al. 2017b). This cost represents the excess expenditure of gambling by those engaging in harmful or problematic gambling. The rationale, outlined by the Productivity Commission (1999), is that, if not for the gambling addiction, those with gambling problems would likely spend an equivalent amount of money on gambling as non-problem gamblers (that is, those who are making a 'rational' decision to spend money on gambling). The assumption is that, for people harmed by their gambling, a part of their gambling spend does not reflect a rational economic purchase in that it does not yield a 'consumer surplus' in terms of providing utility of satisfaction that exceeds the purchase price. This is also called irrational consumption in contrast with normal economic consumption where the buyer is better off with the good or service than the money in their pocket.

Stetzka and Winter (2021) reviewed the literature from various fields to investigate why people continue to gamble despite losing money. The evidence is organised around 3 types of rationality: full rationality, bounded rationality and irrationality. Full rationality means making decisions based on what will benefit the person the most, having stable preferences and being in complete control of their actions. This type of rationality considers the potential for entertainment and excitement, as well as the possibility of winning money. Bounded rationality suggests that people may not always make fully rational decisions due to cognitive limitations, emotional biases and other factors specific to the gambling context. For example, people may be influenced by the excitement and thrill of gambling, leading them to make decisions that are not fully rational from a purely financial perspective. Irrationality is gambling behaviour that suffers from a loss of control, which can be due to illogical cognitions or other factors. The paper defines irrationality based on the degree of control the person who gambles has over their behaviour. If the person who gambles loses control over their behaviour, their behaviour is classified as irrational. Irrational gambling can manifest in behaviours such as chasing losses, overestimating their chances of

winning and being influenced by near-misses or other cognitive biases. These behaviours mean people spend more money on gambling than they can afford, leading to financial harm.

In terms of determining whether gambling spending is rational or irrational, Stetzka and Winter (2021) emphasise the importance of considering both financial and non-financial motives for gambling. While people can derive non-financial benefits from gambling, such as entertainment or social interaction, these benefits do not imply that excessive or irrational spending on gambling activities is a rational behaviour that yields a consumer surplus. But the review also acknowledged that the assessment of rationality in gambling spending is complex. The authors suggested that most people who gamble may be located somewhere between boundedly rational and rational consumers deriving non-financial benefits from their activities. But they found a smaller proportion of the population of people who gamble exhibit irrational behaviour associated with a loss of control.

The method used in the 2017 Victorian economic costing (Browne et al. 2017b) assessed the increased rate of harms over baseline and discounted the excess spend of low-risk, moderate-risk and problem gambling relative to non-problem gamblers based on how much extra financial harm they experienced. Previous costing studies have tended to follow the Productivity Commission (1999) in treating the total difference between the mean amount spent on gambling by a problem gambler and a person who gambles recreationally as ‘excess’ and costing 100% of this amount. But the previous Victorian costing (Browne et al. 2017b) adopted a more conservative approach. The value was calculated by first examining financial harms like less spending on essential items. These harms increase at higher rates for those with worse gambling problems. The excess spending cost was weighted based on how much more frequently each risk level reported financial issues. For example, around 80% of the excess spending for the most severe problem gambling was counted as a cost. But only about 40% of the extra expenditure for low-risk gamblers was considered a cost. This method accounted for higher problem severity, meaning progressively less value and enjoyment was assumed to have been obtained as the amount spent on gambling became more extreme. By applying this discounting, it effectively implements a more conservative attribution than that of the Productivity Commission (1999), which assumed that 100% of the differential between mean problem and non-problem gambler spend was an opportunity cost. This is appropriate, given that some of the opportunity costs were already accounted for by the contribution of financial harms and their flow-on effects to the HRQoL component. In the present costing, we recommend a minor update to this, which is to apply this discount to the HRQoL component, rather than the financial opportunity cost component. This change does not affect the bottom-line figure but more clearly delineates the 2 components. It has the added advantage of aligning the financial costing method used by the Productivity Commission (1999) and others.

The latest Northen Territory costing (Whetton et al. 2018) used a methodology based on the Productivity Commission’s (1999) methodology. But, due to data limitations, this study only included spend associated with gambling on EGMs and excess spend was calculated as the difference between that spent by problem and moderate-risk gamblers and low-risk gamblers (rather than non-problem gamblers). Valuations for excess spending were not included in the Tasmanian costing (SACES et al. 2021), nor the recent international studies (Bhattacharjee et al. 2023; Hofmarcher et al. 2020; Lucchini and Comi 2022; Office for Health Improvement and Disparities 2023).

Legacy harms

Recent research has identified that harm, and therefore ongoing economic cost, may not stop when gambling stops. Langham et al.’s (2016) ‘Conceptual framework of gambling-related harm’ identifies the temporal nature of harms, with harm being experienced as general harms, during a period of crisis and as legacy harms. Legacy harms are described as ‘harms that continue to occur (or emerge) even if the person’s engagement with gambling ceases through changes in their own or someone else’s behaviour, but may also be experienced if a person continues to gamble’ (Langham et al. 2016, p. 5). Legacy harm includes not only the ongoing negative consequences of gambling but also life course harms, which significantly impact the subsequent trajectory of a person’s life, as well as intergenerational harms, where the impacts flow to another generation (Rockloff et al. 2022a). For example, children may have ongoing negative impacts such as poorer school performance or job prospects due to parental gambling when they were young. It has been suggested that apart from the person who gambles and affected

others, legacy harms can extend to social and cultural damage at the community level (Rockloff et al. 2022b).

Despite the conceptual understanding that harm can be ongoing, most research focuses on harm concurrent with gambling problems. Rockloff et al. (2022c) examined legacy harms in a large (*n* = 1,240) study of New Zealanders who had historically been harmed by their own or someone else's gambling, but not within the previous 12 months. Just over half of those who gamble (56.7%) and affected others (57.6%) reported at least one ongoing harm from past (resolved) gambling issues. In harms associated with their own gambling, the legacy harms decreased over time, but this was not found in affected others. The study also calculated the 'half-life' of legacy gambling harm for the gambler, which was the period that a legacy harm was likely to remain a continuing problem. The average half-life was 4 years, with financial, health and emotional/psychological impacts lasting the longest. Cultural, social deviance, work/study and relationship issues were typically resolved faster.

Latvala et al.'s (2019) PHIGam model also includes temporal aspects within its costing framework. But legacy harms have not been comprehensively included in any previous social or economic costings of gambling. This is likely due to the lack of an evidence base regarding the epidemiological progression of gambling problems: incidence, recovery and relapse over the lifespan. Without such a model supported by good evidence, it is very difficult to properly factor in the impacts of legacy harms which, by definition, are only felt once the gambling problems stop and do not recur. Incorporating legacy impacts in assessing gambling's costs is important for fully capturing personal and social consequences because they persist over the lifespan. But, given the significant technical difficulties in properly assessing these costs, the present costing study will follow that of prior studies in not including legacy costs.

Gambling forms

It is accepted that frequent engagement with some forms of gambling is more closely associated with harm than others (Abbott et al. 2018; Hilbrecht et al. 2020). For example, Australians who gamble most commonly nominated EGMs as being the form that contributed the most to their gambling harm (Tulloch et al. 2024). A recent study by Browne et al. (2023) used an aggregated dataset of national and state-based prevalence studies in Australia, comprising 71,103 people. This large dataset allowed the researchers to examine the relationship between the frequency of engagement in different forms of gambling and gambling problems. The study aimed to determine the relative contribution of each form to population-level gambling problems in Australia. The results showed that EGMs, casino games, sports betting and race betting were the primary contributors to gambling problems in Australia, collectively accounting for about 90% of gambling problems. Other common forms, such as bingo and lotteries, had negligible unique impacts on harm.

The findings from this study are important when examining the societal and economic costs of GRH. By identifying the specific forms of gambling that contribute most significantly to gambling problems, policymakers and researchers can more accurately estimate the economic burden associated with different types of gambling activities. For instance, the study by Browne et al. (2023) highlights that EGMs are responsible for over half (between 52 and 57%) of gambling problems in Australia. This suggests that the economic costs directly associated with EGM-related harm, such as healthcare expenses, social welfare support, productivity losses and HRQoL decrements, are likely to be considerable. Understanding the relative contribution of different forms of gambling to the overall burden of gambling harm can inform the allocation of resources for harm minimisation and support services. By prioritising interventions and policies that specifically target the most harmful forms of gambling, such as EGMs, casino games, sports betting and race betting, policymakers can optimise the effectiveness of resources. Likewise, the total economic cost can be reasonably broken down by form based on the relative proportion each form contributes to the total burden of problem and at-risk gambling. The total economic cost of each product tends to be proportional to the total gambling expenditure for that product. But this relationship is not exact. For example, although lotteries account for about 10% of total gambling expenditure, Browne et al.'s (2023) analysis suggests their contribution to gambling problems is less than 1%. Comparing the economic costs of gambling with government revenue and total industry revenue for each product can therefore provide valuable direction in terms of which products represent a poor 'value proposition' to government and the community.

Causal relationships

The literature on causal relationships between gambling and gambling harm is limited (Langham et al. 2016; Patel and McDaid 2019). While some harms, such as financial losses, can be more directly linked to gambling, others, like depression and suicidal behaviours, may have multiple contributing factors, including gambling, mental health issues and substance use, or in many cases, exhibit bidirectional relationships (Browne et al. 2016; Productivity Commission 1999). This makes determining the proportion of harm solely attributable to gambling challenging. To address this issue, the economic costings discussed in this literature review, including the prior Victorian costing (Browne et al. 2017b), generally follow the methodology of the Productivity Commission (1999), where a reduction (usually 20%) is applied to account for this factor of partial attribution.

Applying a uniform 20% discount to account for causality across all harm types and severity levels may underestimate these complex relationships because the degree of reverse causality is likely to vary across different types of harm and gambling severity levels. For instance, the relationship between gambling and depression may involve more bidirectional causality than that between gambling and crime or decreased productivity of affected others. Similarly, the question of causality might be more pronounced in low-risk gambling categories compared with high-risk ones. However, there is currently a lack of empirical evidence to support differential discounting, which needs to be addressed to refine future cost estimates.

Key research gaps

Several critical research gaps and questions emerge from the literature review:

- There is a need for comprehensive methodologies that capture the full spectrum of gambling-related harms, including those affecting low-risk gamblers and affected others.
- There remains a lack of consensus on how to best quantify and monetise intangible costs. Current approaches vary widely, from using VoSLY or crime victim compensation amounts as a proxy, to omitting these costs entirely.
- Questions remain about how to best balance and integrate direct and indirect methods of eliciting HRQoL impacts. Direct elicitation methods tend to yield higher maximum estimates for severe gambling problems. In contrast, indirect methods are more conservative but provide more precise relative estimates across the spectrum of gambling-related harm.
- The inclusion and valuation of legacy harms in economic costings represents a significant gap. Despite conceptual understanding that harm can be ongoing, most research focuses on harm concurrent with gambling problems. There is a lack of evidence regarding the epidemiological progression of gambling problems: incidence, recovery and relapse over the lifespan, making it currently difficult to factor in the impacts of legacy harms into economic costings.
- The impact of harm to children ‘affected others’ represents another significant gap, excluded from all prior costings due to lack of data.
- There is a similar need for improved data and methods with which to value wider cultural harm.
- More robust data and methods are needed to accurately estimate financial harms, including excess spending and irrational consumption.
- There is a need for greater understanding on causal relationships between gambling and gambling harm to more comprehensively account for the proportion of harm solely attributable to gambling problems.

Discussion

Our review of previous costing studies provides some insight and direction to the present costing study. First, there is a high degree of commonality in methodologies, with most efforts being strongly influenced by the Productivity Commission’s (1999) foundational approach. In general, the prior Victorian costing (Browne et al. 2017b) is well situated in this literature, taking an approach that is theoretically and methodologically consistent with other efforts. Second, there is consistent recognition that costs arising from gambling can be broadly grouped into direct or tangible costs (for example, the legal costs of

divorce and treatment services) as opposed to intangible costs, which mostly relate to suffering experienced by those experiencing problems with gambling and those around them. To this is added the opportunity cost associated with the 'negative consumer surplus' associated with irrational or excessive gambling expenditure – that is, excessive money diverted to gambling that does not yield entertainment value to the consumer because of losses and that would be better spent on other needs or wants. Costing studies tend to be characterised by a large number of tangible cost items, but in aggregate these tend to make a smaller contribution to the total cost than the small set of intangible costs. In our view, this reflects the true nature of the burden of gambling harm in which the costs are mostly borne by individuals and families affected by problematic or excessive gambling. In economic terms, this is similar to the effects of a manufacturing industry 'externalising' costs by pumping waste into a waterway. While the enterprise benefits from cheaper production costs and consumers may benefit from cheaper prices, the cost is ultimately realised via poorer environmental quality and potential health impacts or cleanup efforts. Likewise, the gambling industry yields tangible benefits in terms of government revenue, economic activity and community facilities or subsidised sports contributions. But the costs are mostly borne by a subset of people who gamble and those close to them, who experience sometimes very severe (yet 'intangible') impacts through gambling losses. Health and economic costing studies have a valuable role to play in assisting policymakers to put a value to these intangible costs so they can be weighed against the benefits.

Given the outsized contribution of a few intangible costs to the total cost of gambling, it is crucial that the conceptual framework, assumptions and evidence base that inform the calculation of these items is undertaken as carefully as possible. Fortunately, there appears to be relatively little ambiguity or dissent regarding the treatment of excessive expenditure. We are on relatively safe ground in assuming that the differential mean expenditure between problematic gamblers and non-problem gamblers is largely due to the gambling problems. Although what constitutes a 'rational' gambling spend can vary markedly between people depending on variability in disposable income or (perhaps) enthusiasm for the entertainment activity. This non-pathological variability should not be correlated with gambling problem status.

All economic costing studies of gambling take pains to avoid 'double counting', which can arise when there is conceptual overlap between 2 or more cost items. This raises the question of whether there is double counting in costing excessive spend separately from the impacts to HRQoL that are associated with financial loss. Our view is that this is a relatively minor concern on technical grounds, which we will need to briefly outline here. First, the discounting method developed for the previous Victorian costing (Browne et al. 2017b) already provides for a discounting based on associations with harmful financial impacts. The numerical effect of this is to only include the opportunity costs of losses when they greatly exceed that experienced by a typical recreational gambler. Second, while we expect financial losses to positively correlate with HRQoL decrements, these variables are subject to vastly different levels of overdispersion (or positive skew). HRQoL are inherently bounded between zero and one, while financial losses are effectively unbounded, depending on the degree of funds available to an individual. So, for a person with a relatively high capacity to sustain losses, as gambling problems increase, the financial losses can grow exponentially while the HRQoL impacts inherently saturate at an upper bound. For this kind of person, the impacts of extraordinary financial losses might eventually be felt (for example, in terms of decreased propensity to retire early, enjoy travel or to invest in property or business), but these are effects that are not well captured by HRQoL indicators. In short, HRQoL impacts and excessive (adjusted) financial losses are costs that, while somewhat correlated, operate on very different scales, minimising the potential for double counting.

As indicated, the largest single item for gambling economic costing studies tends to be the 'intangible' of HRQoL impacts due to harms associated with gambling, or being closely associated with someone experiencing problems. The reasons for this have been well documented in the literature: excessive time and money spent on gambling leads to a broad spectrum of harmful impacts that can range from mild to severe. On the face of it, this has the potential to lead to issues with double counting due to conceptual overlap. To take just one example, the experience of insomnia might be highly correlated (or co-occur) across people with emotional distress, worry and clinical levels of depression. If these impacts are costed separately, then there is high potential for double counting due to (a) conceptual overlap between

these impacts, and (b) the non-additive nature of HRQoL impacts: a person who experiences both ‘a’ and ‘b’ is likely impacted somewhat less than a + b. This latter property is connected to the bounded nature of HRQoL: the total impact ‘saturates’ because there is an inherent upper limit to a person’s capacity to suffer.

Some of the costing studies reviewed above have nevertheless attempted to cost various intangible impacts separately. But caution in avoiding double counting means that impacts are often missed. For example, if we define depression narrowly as a clinical disorder requiring treatment, and cost this item separately, then other psychological and emotional impacts are generally excluded. In our view, the HRQoL impacts of excessive or problematic gambling are best approached holistically – that is, treating the varied health and wellbeing impacts as symptoms of an underlying condition of experiencing GRH and assessing the HRQoL implications of that condition jointly. In this framework, it is still possible and desirable to calculate and report on more specific HRQoL impacts such as clinical depression. But since these specific impacts are mostly or entirely subsumed within HRQoL impacts linked to gambling, up to 100% of those costs should be deducted from the HRQoL component to avoid double counting.

Fortunately, both before and after the 2017 Victorian costing study, extensive work has been done to evaluate the HRQoL impacts of differing levels of gambling problems and gambling harms. Also, there is an established rationale and a consensus that these impacts can be translated to monetary terms via conversion of HRQoL with respect to GDP per capita. These methods inherently ‘collapse’ a variety of specific comorbid health and wellbeing-related impacts into a single metric by treating them as symptoms of an underlying condition. A strength of this literature is that various direct and indirect elicitation protocols have been employed, helping to triangulate a common estimate that is independent of methodology. But, while these results are relatively consistent in terms of the relative degree of impact across the spectrum of harms or problems, the absolute scale of the impact depends on methodology. Most importantly, direct elicitation methods tend to yield maximum estimates for severe gambling problems or harms at between 0.4 or 0.5, while indirect methods are far more conservative, yielding maximum estimates at around 0.11. Because direct elicitation is done via a straightforward evaluation with respect to the community and experts, it yields decrements that are meaningful with respect to the opinion of these groups. But, because they are subjective evaluations, for a low impact (for example, a GHS score of 1, or low-risk gamblers), it may be subject to upward bias via stigma and framing effects. On the other hand, indirect elicitation methods rely on standard health utility instruments such as the SF-6D, which tend to focus on physical pain and disability and are relatively insensitive to the kinds of HRQoL impacts that gambling causes. Also, these methods often employ a case-control weighting and statistical control of comorbidities and risk factors, which tends to lead to overly conservative estimates. Nevertheless, while indirect methods yield decrements that are scaled much lower than the expert or community consensus, they yield very precise relative estimates across the spectrum of GRH. This is particularly important when assessing the impacts of gambling, which are subject to the ‘prevention–paradox’ effect in which small errors or biases at the lower end of the spectrum are multiplied by the much larger group of people in this category, having the potential to distort the overall estimate.

The present costing study will source and synthesise both direct and indirect estimates of HRQoL. The absolute terms being defined are the maximum or saturated HRQoL estimate, and the relative term is the ‘curve’ of impact with respect to gambling harms or problems. The absolute term will be determined by the consensus (mean) estimate of all available direct elicitation protocols. The present study has the advantage of having access to the 2023 VPGHS, which includes both the GHS-10 and the GHS-10-AO. These are dedicated harm measures for both those who gamble and affected others. They have associated HRQoL weights estimated via indirect elicitation, which we scale by the consensus saturated or maximal effect, as synthesised from all available published protocols.

We have already noted that the framework used for the previous Victorian costing (Browne et al. 2017b), and by extension the present costing, is well situated within precedents set elsewhere, which in turn were all strongly influenced by the Productivity Commission’s important and seminal (1999) approach. Given this, it is worth drawing attention to the important ways in which the current approach differs and, in our view, improves on previous work. First, the Productivity Commission’s (1999) approach appears to have been overly conservative in defining a threshold for substantive HRQoL impacts from gambling – that is, those with a score of 10 or above on the SOGS (47,000 people), which is much smaller than the

293,000 estimated problem gamblers nationally. Also, there is growing consensus that lower levels of gambling problems (for example, moderate-risk gamblers) can give rise to non-negligible levels of harm, which together (due to much higher prevalence) are on a similar scale to that borne by the smaller segment of problem gamblers. Almost all the discrepancy in the per-capita impact estimated by Browne et al. (2017b) can be linked to the Productivity Commission's (1999) arguably overly conservative approach to intangible impacts.

In 1999 there was little concrete information about the HRQoL impacts from gambling. This is acknowledged in the Productivity Commission's (1999) report, which applied wide confidence intervals for intangibles: estimates of emotional distress for immediate family members varied between $756 million and $2.3 billion, and effects on parents were estimated from between $0 to $666 million. Since 1999, a program of research (Table A1) has used multiple methods and protocols in an endeavour to triangulate the HRQoL impacts from gambling for people who gamble and for affected others across the severity spectrum. This puts the present costing study in a far more advantageous position to cost these components. This is important since a consistent finding across diverse costing studies is that intangible costs make up the lion's share of the cost of gambling. For example, in the Tasmanian SEIS (The Allen Consulting Group et al. 2011), 85% to 90% of these costs were linked to personal and family impacts. The Northern Territory study (Whetton et al. 2018) also found most impacts related to intangible HRQoL, with more than half of that linked to affected others.

Finally, the present costing represents an advance not only with respect to the Productivity Commission but also with respect to the prior Victorian costing (Browne et al. 2017b). Since 2017, HRQoL disability weights have been published for both the GHS-10 and the GHS-10-AO, which are direct self-report measures of GRH. These can be scaled with respect to consensus estimates for the maximal impacts of gambling harms or problems, and then introduced into the economic costing. Furthermore, the 2023 VPGHS included both the GHS-10 and the GHS-10-AO. This provides for a direct calculation of HRQoL impact for both people who gamble and others, based on Victorian population-representative data gathering during the target period of 2023.

Appendix 6: Literature review references

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