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## 5 The prevalence of ‘problem’ gambling

### Key points

- Based on available survey data, there are between 80 000 and 160 000 Australian adults suffering significant problems from their gambling (0.5 to 1.0 per cent of adults), with a further 230 000 to 350 000 experiencing moderate risks that may make them vulnerable to problem gambling (1.4 to 2.1 per cent of adults).
- Although there are substantial difficulties in calculating gambling expenditure, it is estimated that problem gamblers account for 22 to 60 per cent of total gaming machine spending (average of 41). The likely range for moderate risk and problem gamblers together is 42 to 75 per cent.
- Most policy interest centres on people playing regularly on gaming machines. While the results vary by surveys, it is estimated that around:
  - 600 000 Australian adults (just under 4 per cent) play the pokies weekly or more.
  - 15 per cent (95 000) of this group are ‘problem gamblers’. A further 15 per cent of pokie players face ‘moderate risks’.
- While not definitive for Australia as a whole, problem gambling prevalence rates among the adult population have probably fallen since the 1990s.
- Falling regular EGM playing is an important component of this outcome, though natural adaptation, government policies and actions by venues have probably also contributed. However, for the key indicators for policy, there is:
  - no evidence that the share of total spending accounted for by problem gamblers has fallen
  - no reliable indications of a significant decline in the rate of problem gambling among regular EGM players.

Problem gambling is an abstract and contested construct, with differences in its conceptual underpinnings and in the resulting measures of prevalence and severity. As normally defined, ‘problem gambling’ is distinguished from the broader problems that gamblers experience (chapter 4), because it requires a person to have a *cluster* of behaviours and sufficiently severe problems.

There are competing conceptual approaches to measurement of problem gambling. One approach characterises it as a psychiatric condition, identified by a set of

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dysfunctional behaviours. This is a model particularly favoured in the United States. The Diagnostic and Statistical Manual of Mental Disorders — the DSM IV — explicitly includes problem (‘pathological’) gambling as an impulse control disorder. Some segments of the Australian gaming industry also classify problem gambling this way:

Problem gambling is ... a psychological condition. Americans call it pathological gambling, a far more accurate description. (David Costello, Clubs NSW Chief Executive Officer, 2009)

Clubs Australia, however argued that ‘problem’ gambling is a complex phenomenon, favourably citing research on the importance of ‘rational addiction’, where people choose to be addicts (sub. DR359, attach. p. 29).

Others argue that problem gambling should be assessed by its collective impacts, not by the psychological characteristics of gamblers. For instance, Svetieva and Walker (2008) urge that:

... problem gambling must be measured by the number and extent of the problems caused by gambling, not whether or not the gambling behaviour has the characteristics of addiction or any other individual psychopathology (p. 161).

The distinction raised by Svetieva and Walker is potentially important. If a person has some of the psychological behaviours consistent with ‘addiction’, including difficulties in controlling gambling, chasing losses, borrowing to gamble and the need to increase stimuli to maintain the same level of excitement, then they will be categorised as problem gamblers using most existing screens.

There are several difficulties in the psychopathological approach.

The weakest difficulty is that at the *conceptual* level, a person may have these traits without harm if the financial consequences are not excessive and if they do not want to stop their behaviour. However, in *fact*, many people exhibiting such traits do generally experience harm.<sup>1</sup>

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<sup>1</sup> For example, borrowing from someone or selling something to gamble is not, on the face of it, a harmful behaviour. But, in fact, if a person does do this, they are very likely to display other behaviours that do cause problems. In the 2006 NSW prevalence survey, 93 per cent of regular gamblers who sometimes, often or always borrowed or sold things to gamble rated themselves in a separate question as having some kind of problem. Only 7 per cent of people engaging in this behaviour identified themselves as having no problem. So screens may legitimately measure behaviours or outcomes, not because these actually constitute problem features of gambling themselves, but because they are effective markers of problems.

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A more serious drawback is that the psychopathological approach risks under-enumeration of people suffering significant harm, but whose gambling behaviours and attitudes could not be categorised as ‘pathological’.

In addition, this approach focuses on the individual as the source of the problem. It is based on identifying people who meet the criteria for a mental disorder, with characteristics and behaviours that make them vulnerable in what might otherwise be seen as a generally benign gambling environment. The psychopathological approach tends to concentrate policy attention on venue interventions and treatment services targeting people categorised as disordered.

In contrast, a broader social approach recognises that some problems reflect the nature of the product itself and venue behaviours, as well as the behavioural characteristics of the gambler. When such problems occur for consumers suffering significant detriment in other contexts, they are referred to as consumers experiencing detriment, rather than ‘problem consumers’. For instance, many people fooled by internet scams may be naïve, poorly educated or just vulnerable, but policymakers generally identify the real problem as stemming from the behaviour of the ‘suppliers’ concerned. Similarly, in many issues of product safety, the problems arise because of the combined influence of the behaviour of the consumer, the environment in which they are using the product and the design of the product, with none of these a decisive source of the problems. Accordingly, the social approach tends to place emphasis on environmental factors, like gaming machine technology or venue behaviours, that lead to, or exacerbate, harm.

That said, while measurement of problem gambling should be centred on enumerating those suffering significant harm and on all the factors — social, psychological and environmental — that lead to this harm, this does not mean that problem gambling cannot sometimes reflect a psychiatric disorder. The evidence suggests that:

- people identified as problem gamblers often resolve their problems after counselling and treatment, whereas ‘treatment’ would generally not be advocated for consumers experiencing detriment
- there are higher risks among people with pre-existing mental health conditions and dependencies, such as depression, bipolar condition and alcohol dependence<sup>2</sup> and the validity of ‘addiction’ for some (Van Holst et al. 2010, Potenza 2007). That has implications for treatment providers as they must

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<sup>2</sup> For example, McIntyre et al. (2007); Kessler et al. (2008); Jackson (2009); Pietrzak and Perry (2006); Pietrzak et al. (2005, 2007).

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sometimes deal with the problems, false cognitions and drives associated with gambling problems, as well as other serious co-morbidities

- compulsive gambling can be genetically inherited, that it can be caused by certain drugs (associated with treatment of Parkinson’s disease), and that brain scans of those with problems can show quite different patterns from other gamblers.<sup>3</sup>

These strands of evidence suggest that problem gambling can *sometimes* be seen as psychopathological, though even when that is true it does not rule out the relevance of policies that seek to reduce the harms created by these pathologies through changes in the gambling environment.

Overall, problem gambling is probably best characterised as a social *and* psychiatric issue where a cluster of significant harms are present, and its measurement and policy responses should reflect that.

## 5.1 “What is ‘the’ number?” — measuring problem gambling

That there are policy significant numbers of ‘problem gamblers’ is widely accepted by governments, community groups and, to a lesser extent, the gambling industry. However, the actual number (and the trends) are contested (for example, Clubs Australia, sub. 164, pp. 70ff). That there remains debate about the numbers of problem gamblers is testimony to the imprecision of instruments used to identify them (box 5.1) and the population surveys that implement these. The practical and conceptual dilemmas in measuring the problems associated with gambling and their population prevalence are summarised by the Australian Gambling Council (sub. 230, pp. 31ff) and Professor Jan McMillen (sub. 223) in this inquiry, and addressed in detail in a major study commissioned for the Ministerial Council on Gambling (SACES 2005a)

At a more fundamental level, debates about the numbers can be traced to differences in judgments about what comprises problem gambling. It is simply not possible to ‘accurately’ measure something whose definition is not widely agreed.

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<sup>3</sup> For example, Xian et al. (2007); Bostwick et al. (2009); Williams and Potenza (2008); Pallanti et al. (2006); Potenza et al. (2003); and Abler et al. (2009).

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### Box 5.1 Problem gambling screens

'Problem gambling' is typically measured using psychological 'screens' (a short set of questions relating to gambling behaviours and beliefs) applied to a sample of the general population. The preferred screen for problem gambling in Australia is now the Canadian Problem Gambling Index (CPGI), which has been used in all recent Australian prevalence studies. Prior to that, Australian population prevalence studies (including the Commission's own in 1999) employed the South Oaks Gambling Screen. The screens share many common features, but the former has fewer questions, less of a preoccupation with sources of money for gambling, a better theoretical basis and has better psychometric characteristics (Jackson et al. 2009; Wenzel et al. 2004; Ferris and Wynne 2001).

The CPGI asks people to rate the frequency of nine behaviours/attitudes over the last year of gambling, with the options on any question being never, sometimes, most of the time or almost always. The questions are:

1. Have you bet more than you could really afford to lose?
2. Still thinking about the last 12 months, have you needed to gamble with larger amounts of money to get the same feeling of excitement?
3. When you gambled, did you go back another day to try to win back the money you lost?
4. Have you borrowed money or sold anything to get money to gamble?
5. Have you felt that you might have a problem with gambling?
6. Has gambling caused you any health problems, including stress or anxiety?
7. Have people criticized your betting or told you that you had a gambling problem, regardless of whether or not you thought it was true?
8. Has your gambling caused any financial problems for you or your household?
9. Have you felt guilty about the way you gamble or what happens when you gamble?

#### *Scoring Instructions for the CPGI*

Total your score. The higher your score the greater the risk that your gambling is a problem. Score the following for each response: never = 0, sometimes = 1, most of the time = 2, almost always = 3.

Scores for the nine items are summed, and the results are interpreted as follows: 0 = Non-problem gambling; 1–2 = Low level of problems with few or no identified negative consequences; 3–7 = Moderate level of problems leading to some negative consequences; 8 or more = Problem gambling with negative consequences and a possible loss of control.

Source: [www.problemgambling.ca](http://www.problemgambling.ca).

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It is notable that where the South Oaks Gambling Screen (SOGS) has been used at the same time as the Canadian Problem Gambling Index (CPGI), the rate of people scoring SOGS 5+ (the SOGS definition of a problem gambler) is higher, sometimes by a large margin, than CPGI 8+ (the CPGI definition of a problem gambler). This highlights the fact that deciding when to use the term ‘problem gambler’ is arbitrary — and as argued below, dependent on the intended policy and research purposes of the measure. (The differences between SOGS and CPGI ratings are also relevant for understanding trends in prevalence in Australia — which we examine in section 5.8.)

The ambiguities about problem gambling raise two important issues:

- how to define a case meaningfully
- false positives and negatives.

## **5.2 A true ‘case’ is hard to find**

Incidence and prevalence measures are counts of people suffering from something; that is ‘cases’. For many human conditions it is easy to define a case. So, either a brain tumour exists or it does not. But such clarity is elusive for problem gambling for several reasons.

### **There is no gold standard**

For one thing, there is no agreed ‘gold standard’ against which survey instruments, such as the CPGI, used to assess problems and harms can be tested to measure their validity. While clinical interviews can be used to assess whether someone may be experiencing certain psychiatric symptoms, they are not so clearly able to confirm many aspects associated with harm, including:

- some facets of emotional distress, which are subjective and difficult to verify, and which may be exaggerated or understated
- stigmatising outcomes that people tend to conceal — criminal activity, relationship breakdown and lower job productivity
- exaggerated or falsely attributed outcomes (for example, when someone attributes depression to gambling when it may have been a pre-existing condition).

In any case, a clinical assessment is rooted in the notion of gambling problems as a psychiatric disorder, whereas as emphasised above, clinically-defined ‘problem

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gambling’ is only a subset of those people experiencing significant gambling problems (which itself is only a subset of the overall problems people experience with their gambling — chapter 4).

### **Problem gambling is an integrated measure**

The difficulties in determining cases of ‘problem gambling’ also partly reflect the desire to have just one integrated measure of problems, which requires a cluster of problems to be present. As such, disagreement about the appropriate cluster will lead to disagreement in measures of the prevalence of problem gambling. For instance, someone could suffer some significant harm associated with gambling — for example being ‘fooled’ into spending too much money because of misunderstandings about how gaming machines work — and then suffer large adverse consequences for household finances and their level of anxiety (both of which are aspects of the CPGI). If they did not experience other problems, they would not be rated as a problem gambler using conventional screens. (One of the advantages of the population health approach discussed in the previous chapter is that it considers harms wherever they arise, not just the arbitrary group of harms that are clustered together in particular individuals.)

### **Harms are hard to measure and to aggregate**

In the CPGI questions typically used in Australia to measure problem gambling, respondents are asked about behaviours or experiences at different frequencies, ranging from never, rarely, sometimes, often to always. This is a subjective, rather than a numerical, assessment of frequency and of the corresponding magnitude of harm experienced. They cannot be readily summed across different questions or across individual respondents (unlike, for example, the detriment caused to a group of consumers overcharged on a product). For instance, the level of harm experienced by one person saying that he or she has ‘sometimes’ experienced a health problem due to gambling may be quite different from another individual giving the identical response.

Moreover, many forms of harm are hard to measure and confirm because:

- of their subjective nature (such as guilt, anxiety or despair)
- they may be subject to exaggeration or understatement (especially where the outcome is a stigmatising one, such as criminal activity, relationship breakdown or lower job productivity)

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- of attribution problems and recall biases. For example, someone with a pre-existing mental health problem, such as depression or anxiety, may attribute the condition to gambling because the severity of the condition increased with problem gambling. Or someone who has developed depression while gambling may attribute it to gambling, when other factors are also contributory.

That said, many of the questions posed in the CPGI (and SOGS) have good face validity, the patterns of responses across items and their links to exposure are consistent, and the results of testing CPGI in clinical and general counselling settings suggest that the CPGI provides a valid, if partial, metric of harm.

### **Problem gambling as a continuum**

Problem gambling is often characterised on a continuum of increasing severity. At one end, recreational gamblers gain consumer benefits from gambling and the social environment in which gambling is offered.<sup>4</sup> At the other end, are those people experiencing (or causing) severe harms from gambling — such as poverty, fraud, family breakdown and suicide. Between these two extremes, there are people facing either heightened risks of future problems or varying levels of harm. Prevalence measures must therefore be based on judgments about the appropriate thresholds for varying intensities of problems and risks. As noted by Gambino (2005), the thresholds entail ‘some degree of arbitrariness’. This is a key reason why different screens can give such different measures of problem gambling and why the range of estimates provided by the Commission in section 5.4 are so wide.

The fact that ‘cases’ are hard to define when problems lie on a continuum is common to many other public health issues, yet cases can still be defined that are useful for policy or research. As an illustration, being either overweight or obese is defined by a threshold in a ‘pinch test’ or body mass index. That threshold does not provide a good measure of the likely relative health and social outcomes for individuals who lie *around* the threshold, but it does provide a basis for assessing the relative risks for the *average* person in both groups.<sup>5</sup> And they can be useful for identifying people who should either moderate their behaviour or for identifying the size and nature of subpopulations at risk of more severe problems.

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<sup>4</sup> Though beyond the enjoyment of gambling, there is little evidence in favour of broader social or personal wellbeing benefits to gamblers (Rodgers et al. 2009, p. 88).

<sup>5</sup> For instance, a person who just progresses from overweight to obese does not have a sudden jump in their risks of morbidity and mortality.

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### 5.3 ‘False positives and negatives’: how accurate are the surveys?

Gambling screens inevitably involve misclassification errors among different risk groups, such as recreational gamblers experiencing no harms; low risk gamblers; moderate risk gamblers; and problem gamblers (to use the CPGI categories). Altogether, there are twelve possible misclassification errors using the CPGI among these groups.<sup>6</sup>

Of these, the biggest concern usually relates to errors in diagnosing people with the most severe form of problem gambling (those scoring 10+ using the SOGS screen and 8+ on the CPGI), since these people and their families bear the biggest costs and are also the main targets of help services. In that context, there are four possibilities and two types of error:

- true positives: people correctly identified as problem gamblers
- true negatives: people correctly identified as not problem gamblers
- false positives: people incorrectly identified as problem gamblers
- false negatives: people incorrectly identified as non-problem gamblers.

#### *False positives are likely to be present*

It is often claimed that there are significant risks of false positives when using problem gambling screens, such as the CPGI and SOGS, resulting in potentially exaggerated measures of prevalence — a point validly made by Clubs Australia (sub. 164, p. 73). This problem can occur because of the different sizes of the underlying populations affected by misclassification errors. Problem gambling is a relatively rare phenomenon in the total adult population, so that the group of people who truly do not have a problem of that degree is large. If only a small share of the non-problem gambling group — say just 0.3 per cent<sup>7</sup> — are misidentified as problem gamblers, then this can considerably inflate the measured prevalence rate. So, to give a concrete example calibrated to the Australian adult population, were there to be around 15.8 million non-problem gamblers in Australia, then with a misclassification rate of 0.3 per cent, only 70 per cent of the group testing as problem gamblers would really be so (figure 5.1).

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<sup>6</sup> That is, there are 4×4 possible combinations of the measured and actual classifications of gamblers under the CPGI, with only four of these being correct.

<sup>7</sup> In epidemiology, the error rate is referred to as (1-specificity), where specificity = TN/(TN+FP) and TN are the true negatives and FP are the false positives of a screen.

## Figure 5.1 Diagnosing problem gambling

False negatives and positives: an example

		Actual prevalence of 'condition'		
		Problem gambler	Non-problem gambler	
Gambling screen test results	Positive test result	<b>True positive</b> 112,000	<b>False positive</b> 48,000	Measured prevalence 160,000
	Negative test result	<b>False negative</b> 60,308	<b>True negative</b> 15,779,692	Apparent non-prevalence 15,840,000
		True prevalence 172,308	True non-prevalence 15,827,692	Adult population 16,000,000

If that were the end of the story, the measured prevalence rate in the example above would be seriously upwardly biased as a measure of the true likelihood of finding people with significant gambling problems in the community. Whether this is in fact true depends on the degree to which there are offsetting instances where problem gamblers are misclassified as non-problem gamblers. In many diagnostic tests, such false negative rates are kept low by categorising less significant problems as potential indicators of a more severe problem. This can be important if the cost of a false negative (say, dying from cancer) is high relative to the cost of a false negative (a wasted test).

In the case of problem gambling the story is much more complex than in many other standard situations where diagnostic tests are employed.

*False positives depend crucially on the definition of a 'case'*

As discussed above, 'cases' are not so clearly defined for gambling problems. The existing thresholds defining problem gamblers using the CPGI may exaggerate the number of cases where specialist psychiatric treatment is indicated. But it may not do so for other reasonable definitions of a 'case' — such as a sufficient degree of harm suffered by a gambler or their families and friends — relevant to the adequate provision of broader counselling services. So, against a harm-based standard, the existing cut-offs for the definition of a problem gambler in the CPGI can be expected to have fewer false positives and more false negatives.

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*False positives for the ‘problem gambling’ category are often true positives for other gambling problems*

False positives may still have significant public policy implications, whereas in many medical diagnostic tests, a false positive has no clinical implications. In a gambling context, the most likely reason for a false positive diagnosis of problem gambling is that the person has gambling problems that are just not quite severe enough to be called problem gambling. So, many false positives in the problem gambling category of the CPGI are likely to be false negatives for moderate gambling problems, and are still strongly relevant for public policy. The danger of the simple dichotomy shown in figure 5.1 is that it loses sight of this fact.

*Australian jurisdictions have not used the CPGI as originally specified*

The recommended scoring method for the CPGI has only been followed in three Australian prevalence studies.<sup>8</sup> The remaining Australian prevalence surveys that have used the CPGI have modified the screen scoring and labels,<sup>9</sup> which may increase the false negative rate for the problem gambling classification (Jackson et al. 2009). In one case, the Victorian 2008 survey, the questions have also been asked in a different order, with unknown effects on reliability.

In a response to a query regarding the Australian application of the CPGI, the originator of the instrument, Harold Wynne, stated ‘I am often dismayed that researchers disregard the CPGI scoring protocol’ (box 5.2). Analysis by the Commission of individual CPGI scoring results (appendix D) suggests that where the test has been changed, this has:

- underestimated the number of problem gamblers, but by a relatively small margin. Had the original screen been used, the absolute number of problem gamblers would probably be a few per cent higher
- exaggerated the number of people with moderate risks, with the potential for incorrect identification of around one in twenty moderate risk gamblers
- had ambiguous effects on the numbers of people identified with low risks
- underestimates the numbers in the no risk population, but by a negligible degree.

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<sup>8</sup> These are the prevalence studies undertaken in Tasmania 2007, the Northern Territory in 2005 and the 2007 Victorian Risk and Protective Factors Study.

<sup>9</sup> These are the Queensland prevalence studies for 2001, 2003-4, 2006-07 and 2008-09; the Victorian 2003 and 2008 surveys, the South Australian 2005 survey and the NSW 2006 survey.

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Accordingly, the use of an *amended* CPGI is most likely to have *overstated* the population of gamblers of most interest to policymakers (the combined moderate risk and problem gambling groups), albeit probably not to a policy-significant degree. Regardless, it is hard to justify changing a carefully tested instrument, and there must remain some uncertainty about how the adapted and original test instrument scores align with each other.

**Box 5.2 The CPGI prevalence screen has not been used properly in Australia**

The standard CPGI screen recommended a scoring method of 0=never, sometimes=1, most of the time=2, and almost always=3. But some Australian jurisdictions have used a different nomenclature and scoring approach, with never=0, rarely=1, sometimes=1, often=2 and always=3.

Gambling screens are not static diagnostics, but change to reflect new (openly available) evidence and theory. However, in the case of the unique Australian implementation of the CPGI, it is not clear *why* the scoring measure was changed. The originator of the CPGI, Harold Wynne, provided no advice to Australian governments on changing the screen and, because it changes the psychometric properties of the test, does not consider the alternative scoring approach an appropriate one, ahead of evidence in its favour.

While acknowledging that empirical research would be needed to confirm these points, Harold Wynne hypothesized that:

- on the one hand, the term ‘always’ is too definitive and absolute for many gamblers (compared with ‘almost always’, thus potentially reducing the number of people scoring as problem gamblers (thereby introducing a higher level of false negatives into the test)
- on the other hand, introducing two response options in the low risk area (‘rarely’ and ‘sometimes’) rather than the original one (‘sometimes’) gives respondents two opportunities for an affirmative response, is likely to increase the number of cases in the low risk category, ‘compromising the classification accuracy in the CPGI low risk category’).

The Commission undertook modelling to assess the likely impacts of the change in the instrument (appendix D).

*Source:* Personal communication from Harold Wynne (April 2009).

*Non-response and misreporting bias is likely to raise false negatives*

Non-response and misreporting biases may be very significant in prevalence studies undertaken for the full adult population. On the practical side, there are many difficulties in contacting people who gamble frequently:

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- problem gambling surveys are usually based on interviews over fixed line telephones. Young people — who are known to have higher risks of problem gambling (for instance, AC Nielson 2007, p. 10) — are often out or only use mobile phones. In the NSW prevalence survey, A C Nielson reported that there was 40 per cent under-sampling of people aged 18–24 years old. (The next highest level of understatement was around 18 per cent and related to the next age group of 25–34 year olds.) While under-sampling can be partially corrected through weighting, that still requires the strong assumption that the group of young people who are at home or do use fixed line phones are representative of those omitted from the survey<sup>10</sup>
  - people in jails or other non-sampled institutions have high rates of problem gambling, as do people with disconnected phones (Williams and Wood 2007, p. 369).<sup>11</sup>

These biases may be further increased, as the screening instrument is sometimes only applied to sub-populations of gamblers, typically ‘frequent’ gamblers. Even here, there are inconsistencies, as different Australian jurisdictions have selected different definitions of what comprises a ‘frequent’ gambler.<sup>12</sup> While posing CPGI questions to regular gamblers avoids respondent burden and lowers the costs of surveys, it may miss out on some people experiencing harm from their gambling. For instance, some high-spending binge gamblers may still have periodic severe problems. Jackson et al. (2008) found that excluding non-regular (weekly) players from a 2007 Victorian prevalence survey reduced the measured prevalence rate of problem gamblers (CPGI 8+) by around 35 per cent and moderate risk gamblers by 30 per cent. Accordingly, there is the potential for understatement of problem gambling prevalence in several surveys. This complicates assessment of inter-jurisdictional differences.

An additional concern is that most Australian prevalence studies have sampled adults only (aged 18+). Delfabbro’s (2008a, pp. 61–66) review of Australian gambling research identifies considerably higher levels of problem gambling among

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<sup>10</sup> There are similar difficulties in getting representative samples of Indigenous Australians. As noted in the Northern Territory prevalence study (Young et al. 2006, p. 87), two thirds of Indigenous people do not have access to a home phone, and were outside the scope of the survey.

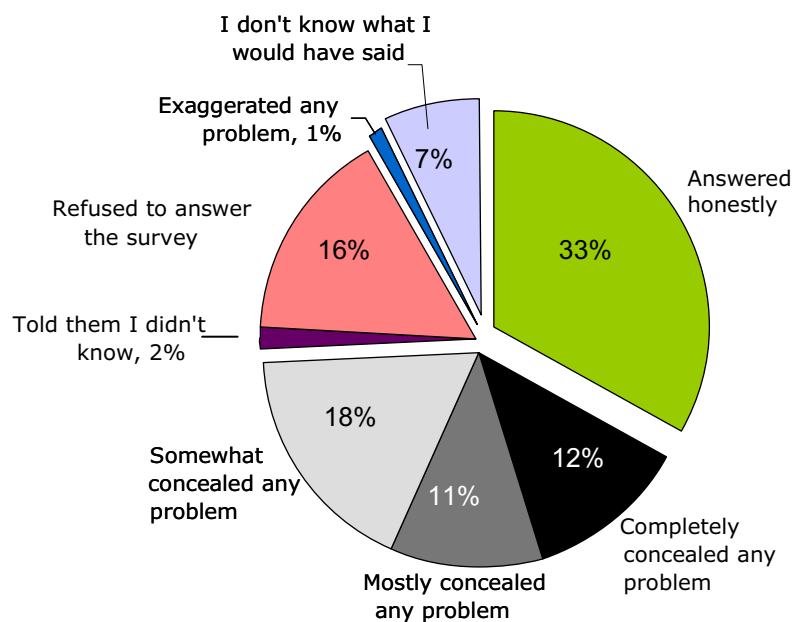
<sup>11</sup> Sometimes there is an added concern that people heavily involved in gambling may be more often out at the time of calls and less likely to be included in the survey. However, Williams and Wood (2007 p. 384) showed that the average number of phone call attempts to reach problem gamblers in a Canadian prevalence study were not substantially more than non-problem gamblers, suggesting that this is not a source of bias.

<sup>12</sup> For instance, the 2005 South Australian survey defines regular as fortnightly or more.

underage gamblers than adults. By omitting underage gamblers, the published prevalence estimates will accordingly tend to understate the true number of Australians experiencing problems, and potentially to underplay their policy significance. Such underage problems are relevant to measures that venues may use to avoid gambling by minors — including card-based gaming — and to the provision of education relating to gambling.

Beyond these concerns, a major likely source of false negatives in a population prevalence study is that problem gambling is a stigmatised behaviour. This is one of the reasons why those people affected by it attempt to conceal it from friends and family or to avoid seeking help.<sup>13</sup> Given this stigma, it can be expected that many people would reduce or disguise the harms they experience (respondent bias), or simply refuse to participate in screening surveys (non-response bias) (figure 5.2).

**Figure 5.2 How problem gamblers in counselling said they would answer a prevalence survey**



*Data source: PC survey of clients of counselling agencies (appendix F).*

Based on the Commission’s survey of the clients of problem gambling counselling agencies, around 60 per cent of problem gamblers said that they would refuse to participate in a population screening survey, would say they did not know or would

<sup>13</sup> In the NSW 2006 survey, of those people who thought they had a problem and had not sought help, more than one in ten cited their embarrassment as the obstacle. (Clearly, those who did not answer the prevalence survey itself because of embarrassment or stigma are not included in this estimate, so the role of stigma is likely to be considerably higher — as suggested by the survey of clients of counselling agencies.)

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conceal their problems (with similar results to those found in the previous inquiry PC 1999, p. 6.36). Only one per cent said they would exaggerate their problems (figure 5.2).

In addition, in a large-scale study of patron behaviour in gambling venues, Sharpe et al. (2005) considered that there was a significant risk that problem gamblers were less likely to participate in the study (lowering the measured prevalence rate):

Anecdotally, those patrons who were present in venues every night and gambled heavily were noted to be reluctant to take part in the study (p. 514).

AC Nielson (2007) in reporting on the telephone survey methodology in the NSW prevalence study observed that:

... it is likely that someone with a severe gambling problem will not be inclined to participate in a self-report survey. Similarly, the target population may have been reticent to disclose personal, sensitive and confidential information. (p. 151)

The stigma associated with problems also means that Likert categories, such as 'rarely', probably should not necessarily be taken literally when implemented in a population setting. First, someone who actually 'often' does something that is seen as problematic (say road rage or getting drunk), may well simply say that they do it only 'rarely' or 'sometimes'. (These latter two categories in the Australian implementation of the CPGI score as one in the test, while 'often' scores as two).

Second, 'rarely' is a measure of frequency not of harm per se. Even if someone does something rarely, it may be quite harmful to them and others. For instance, someone may rarely suffer a health problem from gambling, but that health problem might be a very harmful one (for instance, a single attempted suicide after a big and unaffordable loss).<sup>14</sup> Depending on the specific question (including those relating to harm that are not asked in the CPGI), it may be appropriate to sometimes rate rarely experienced outcomes as indicators of harm.

### **Which predominates: false positives or negatives?**

More than 90 per cent of people identified as problem gamblers using the SOGS (10+) and CPGI (8+) said that they were significantly harmed by their

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<sup>14</sup> While not based on the response to a CPGI question, a question relating to the effects of gambling illustrates the point. The Victorian 2003 survey asked gamblers if their gambling had never, rarely, sometimes, often or always led to the breakup of an important relationship. 0.5 per cent of gamblers said that this had happened rarely, a further 0.4 per cent sometimes and 0.2 per cent always. Even when rare, relationship breakdowns of any frequency due to gambling suggest significant gambling problems.

gambling, suggesting that false positives are not a major issue when identifying the prevalence of severe problems (table 5.1).<sup>15</sup>

**Table 5.1 People experiencing significant problems with their gambling**

<i>Regular gamblers<sup>a</sup></i>	<i>Share experiencing significant problems<sup>b</sup></i>
No risk (CPGI 0)	2.5
Low risk (CPGI 1-2)	5.5
Moderate risk (CCPGI 3–7)	39.8
Problem gambling (CPGI 8+)	91.3

<sup>a</sup> Regular gamblers were people gambling at least weekly on a gambling form other than lotteries and scratchies. <sup>b</sup> Harm was defined using a fairly stringent test that only rated a person as having a clear problem if they experienced any of the following as a result of gambling: always felt they had a problem; often or always experienced adverse health effects; always experienced financial difficulties; always felt guilty; always adversely affected job performance; self-rated their problems as 5 or more on a scale of 1 to 10; had self-excluded; tried to get help; or experienced suicide ideation. A person did not need to have all of these present, but must have had at least one to be rated as harmed. Most had more than one.

*Source:* Analysis by the Commission of the 2006 NSW prevalence study.

Assessing the importance of false negatives is more demanding. Researchers cannot estimate whether the CPGI or other test instruments misclassify gamblers if respondents fail to respond to questions or conceal their problems. Nevertheless, the Commission’s 1999 survey found that group identified using the HARM index was more than four times larger than the group identified as problem gamblers using the SOGS 10+ criterion (PC 1999, p. 6.30).

Recent state prevalence surveys confirm that many people outside the ‘problem gambling’ group say they have experienced problems across multiple dimensions (chapter 4). As might be expected, the probability of harm rises with the risk rating. (If this were not the case, then the CPGI would not be a good instrument).

## **5.4 The headline indicator: identifying ‘problem’ gamblers**

The benchmarks for assessing gambling have changed since the Commission’s 1999 report (which found that around 290 000 Australians or around 2 per cent of the adult population were problem gamblers). That report’s estimates were based on

<sup>15</sup> And while around 40 per cent of people scoring 5–9 on the SOGS in the PC’s 1999 survey did not experience harm as defined (a false positive), the overall prevalence rate of harm was not significantly different from the prevalence rate based on SOGS 5+ because there were also many false negatives (people not scoring as a problem gambler on SOGS who were nevertheless harmed).

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the SOGS screen for problem gambling, whereas recent prevalence surveys have used the CPGI. As we discuss later, the two screens are not directly comparable and their results should not be compared without adjustment. (The Commission has not undertaken a national survey in this inquiry — for the reasons described in chapter 1.)

Drawing on the most recent surveys (tables 5.2 and 5.3), the Australian prevalence rate for problem gambling, measured as a score of 8 or more on the CPGI, is likely to range between 0.5 and 1 per cent of the adult population, with a median of 0.64 per cent and an average of 0.69 per cent. (Results for different jurisdictions vary.) Assuming this average applies to the whole population, then that suggests around 115 000 problem gamblers in Australia in June 2009. However, these results are from sample surveys, which have a substantial degree of statistical imprecision. Based on statistical analysis of the CPGI prevalence rates available, the Commission estimates that the number of problem gamblers in Australia lies somewhere between 80 000 and 160 000 using the CPGI 8+ criterion. These are estimates of current prevalence — problems that are experienced over the last year. Lifetime prevalence rates are much higher (at around twice the current prevalence rate), reflecting the fact that people who develop problems often resolve them.<sup>16</sup>

In the Commission's view, the above estimate is the most appropriate indicator of the number of Australians with significant gambling problems, since other evidence shows that people scoring CPGI 8+ are much more likely to suffer severe difficulties than other risk groups. For instance, as discussed earlier, around 90 per cent of those scoring as problem gamblers under the CPGI had experienced clear harm or faced high self-reported problems, much greater than for other risk categories (table 5.1 above).<sup>17</sup>

But a score of CPGI 8+ is not the only possible indicator of problem gambling. Some researchers define problem gambling as the combination of 'moderate' problem gambling (CPGI 3–7) and 'severe' problem gambling (CPGI 8+) (Wood and Williams 2009, p. 34).

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<sup>16</sup> The 2003 Victorian prevalence study posed a question about self-identified problem gambling. The group that had ever had a problem (either now or in the past) was 1.94 times bigger than the group identifying a problem only in the last 12 months. Abbott (2006, pp. 11–12) found that lifetime prevalence rates in New Zealand were 2 to 2.25 greater than current rates.

<sup>17</sup> The SOGS 10 rating also reveals a similar capacity for identifying people with genuinely severe problems. For instance, the Commission's 1999 surveys found that some 96 per cent of people scoring 10+ on SOGS ('severe' problem gamblers) experienced harm. Similarly, Gambino (2005) found that scores of 10 or more on SOGS indicated a genuine need for help services.

**Table 5.2 Estimates of the prevalence of problem gambling<sup>a</sup>**

Australia, 1995–2009<sup>b</sup>

<i>Jurisdiction</i>	<i>Year</i>	<i>SOGS 5+</i>	<i>SOGS 5-9</i>	<i>SOGS 10+</i>	<i>CPGI 3+</i>	<i>CPGI 3-7</i>	<i>CPGI 8+</i>
		%	%	%	%	%	%
Australia	1999	2.07	1.74	0.33	..	..	..
NSW	1995	2.58	1.96	0.62	..	..	..
NSW	1997	3.10	2.65	0.45	..	..	..
NSW	1999	2.56	2.22	0.33	..	..	..
NSW <sup>c</sup>	2006	..	..	..	2.71	1.76	0.95
NSW	2009	..	..	..	1.7	1.3	0.4
VIC	1996	0.75	0.60	0.15	..	..	..
VIC	1998	1.50	1.20	0.30	..	..	..
VIC	1999	2.14	1.79	0.35	..	..	..
VIC	1999	0.80	0.70	0.10	..	..	..
VIC	1999	2.00	1.70	0.30	..	..	..
VIC <sup>c</sup>	2003	1.13	0.82	0.30	1.87	0.91	0.96
VIC	2007	..	..	..	4.20	2.80	1.40
VIC	2008	..	..	..	3.06	2.36	0.70
ACT	1999	2.06	2.01	0.07	..	..	..
ACT	2001	1.91	1.46	0.45	..	..	..
QLD	1999	1.88	1.50	0.38	..	..	..
QLD	2001	..	..	..	3.53	2.70	0.83
QLD	2003	..	..	..	2.53	1.97	0.55
QLD	2006	..	..	..	2.33	1.85	0.48
QLD	2009	..	..	..	1.96	1.58	0.37
NT	1999	1.89	1.79	0.10	..	..	..
NT	2005	1.07	0.84	0.22	2.02	1.38	0.64
SA	1996	1.24	0.91	0.33	..	..	..
SA	1999	2.45	1.72	0.73	..	..	..
SA	2001	1.89	1.51	0.38	..	..	..
SA <sup>d</sup>	2005	..	..	..	1.65	1.21	0.43
Tas	1994	0.90	0.47	0.43	..	..	..
Tas	1996	2.97	1.84	1.13	..	..	..
Tas	1999	0.44	0.44	0.00	..	..	..
Tas	2000	0.90	0.65	0.25	..	..	..
Tas	2005	1.41	1.23	0.18	1.76	1.03	0.73
Tas	2007	..	..	..	1.35	0.84	0.52

continued

Table 5.2 continued

Jurisdiction	Year	SOGS 5+	SOGS 5-9	SOGS 10+	CPGI 3+	CPGI 3-7	CPGI 8+
		%	%	%	%	%	%
WA	1994	0.56	0.24	0.32	..	..	..
WA	1999	0.70	0.70	0.00	..	..	..

<sup>a</sup> The prevalence is in the Australian adult population. <sup>b</sup> The South Oaks Gambling Screen (SOGS) is a 20 question instrument. Using the Australian nomenclature, a person scoring 5 or more is termed a problem gambler, while a person scoring 10 or more is termed a severe problem gambler. The Canadian Problem Gambling Index (CPGI) is a nine question screen. A person scoring 3–7 is rated as a moderate risk gambler, while someone scoring 8 or more is termed a problem gambler, though the whole group scoring 3 or more are sometimes rated as problem gamblers. (The CPGI also rates low risk gamblers as those scoring 1–2.) As the Victorian Gambling Screen was used in only one study (the 2003 prevalence survey in Victoria) it is not shown above. The validation study found 0.95 per cent of the adult population with a score of 9–20 (borderline gamblers) and 0.74 per cent with a score of 21 or more (a problem gambler). <sup>c</sup> Based on the Commission’s own analysis of the unit record files. The resulting NSW and Victorian (SOGS only) rates shown are modestly higher than the published prevalence study. <sup>d</sup> The SA study finds a problem gambling prevalence rate of 2 per cent, but that was based on the combination of the SOGS criterion with those who subjectively rated their gambling as being problematic of 5 to 10 on a 10 point scale. The more conservative estimate has been used for comparison with other studies.

Source: Based on PC calculations and data from Australian prevalence studies.

In that case, the average Australian prevalence rate would be around 2.4 per cent, implying around 400 000 moderate risk and severe problem gamblers. When statistical uncertainties are considered, this implies a range for moderate risk gamblers of 230 000 to 350 000 (a mid point of 280 000) and between 325 000 to 470 000 people in the combined risk groups. (The ranges for the prevalence of problem gambling and moderate risks separately do not sum to the range of the combined group for the reasons set out in the notes to table 5.3.)

However, using a term ‘problem gambler’ to encompass a set of problems that range from the moderate to the major is not appropriate. For instance, a person could score three by sometimes betting more than they could afford, sometimes feeling guilty, and sometimes being criticised for gambling. These may still be worrying signs — but they suggest risk, more than significant harm — which is why the actual classification of CPGI 3–7 is ‘moderate risk’ not ‘moderate problem gambling’. Chapter 4 sets out a broader framework for considering harms that lie outside the ‘problem gambling’ category.

FINDING 5.1

*The Commission estimates that there are between 80 000 and 160 000 Australian adults suffering severe problems from their gambling (0.5 to 1.0 per cent of adults). In addition, there are between 230 000 and 350 000 people at moderate risk, who experience lower levels of harm, and who may progress to problem gambling (1.4 to 2.1 per cent of adults).*

**Table 5.3 Summary of prevalence rates, June 2009**  
CPGI screen<sup>a</sup>

<i>Risk category</i>	<i>Prevalence rate</i>			<i>Adults affected</i>		
	Average	Lower	Upper	Average	Lower	Upper
	%	%	%	Number	Number	Number
Problem gambler	0.69	0.48	0.95	116 000	80 000	159 000
Moderate-risk	1.67	1.36	2.08	279 000	228 000	348 000
Combined higher risk	2.36	1.93	2.82	395 000	323 000	472 000

<sup>a</sup> The numbers affected are estimated by multiplying prevalence rates by the adult population, based on a projected adult population of 16.75 million for June 2009. The upper and lower estimates are based on an approximation of the 95 per cent confidence range that take account of the relative standard errors of each of the prevalence estimates — not the extreme minimum and maximum values from table 5.2. The sum of the top and bottom ranges of the numbers of people assessed separately as moderate and problem gamblers is not the same as the top and bottom range of those who collectively are assessed as moderate/problem gamblers. This is a statistical outcome that reflects the fact that it is unlikely that there would be a coincidence of a low (high) estimate of people classed as CPGI 8+ and a low (high) estimate for those classed as CPGI 3-7. Consequently, the bounds on the aggregated measure are lower than might otherwise be thought.

Source: Derived from table 5.2.

### *How do prevalence rates look for individual states and territories?*

Table 5.2 also shows the variations across jurisdictions. However, with the exception of the Productivity Commission's 1999 survey, prevalence estimates for the states and territories have been derived from surveys undertaken at different times, and with different methodologies and sample sizes. Some estimates are dated. In addition, imprecision in the estimates mean that, in many cases, what appear to be significant differences in prevalence rates between jurisdictions could have arisen merely as a result of chance. For these reasons, the Commission is cautious about using the figures below to make generalisations about differences in prevalence rates among jurisdictions. Nevertheless, it appears that Tasmania has lower prevalence rates than other states. Other evidence based on counselling data also suggests that Western Australia — which only permits destination gaming — continues to have low prevalence rates (chapter 7 and appendix F).

## **5.5 Exposure and problems**

In the population health area, there is a much greater interest in how harm relates to participation and exposure than just to population prevalence rates. In gambling this includes the nature of the gambling form played, how long or often a person plays and their amount of spending. As noted by Rodgers et al. (2009, p. 9):

Both empirically and conceptually, the gambling literature does not adequately address what would be labelled 'exposure' in other areas of epidemiology ... exposure at the individual level such as frequency and intensity of gambling. These measures could

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provide the equivalent of drinks per week or frequency of binge drinking in the literature relating alcohol use to a wide range of health outcomes. Gambling research tells us little about dose-response relationships...

Chapter 4 explored the connection between harms, broadly defined, and exposure. It is equally useful to examine how the prevalence rate of problem gambling varies with exposure.

*The adult prevalence rate is not the only policy relevant measure of harm*

Policy responses to population health employ scarce resources, such as health professionals and infrastructure. A highly risky activity pursued by the few, like mountaineering, will lead to a low adult prevalence of harm and, accordingly, will not produce enough aggregate harm to warrant much allocation of those resources. In that context, the adult problem gambling prevalence rates measured above are useful for guiding how many health and other resources should be devoted to problem gambling compared with other public health issues. (The evidence shown later suggests that the population prevalence rates of gambling problems are still considerable compared with some other public health concerns.)

However, the measures of prevalence relevant to regulation or community awareness relate to those people who participate in an activity, with a need for different prevalence measures based on the form and frequency of people's exposure to that activity.<sup>18</sup> The population prevalence rate is not relevant. As an illustration, were a supplier to sell a dangerous, but boutique, product that injured 50 per cent of its buyers, its sale would probably be banned or, at a minimum, subject to stringent regulation, notwithstanding the likely rarity of cases among the adult population. A claim by the supplier that there was no need for a regulatory response because a small share of adults was affected would be regarded as disingenuous.

Much of this report (and state and territory gambling policy) aims to reduce the risks of gambling for those who gamble. In that context, the most policy relevant prevalence measures are problem gambling rates (and other harm measures) *among gamblers*. As noted in chapter 2, around 20–25 per cent or more of adults do not

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<sup>18</sup> The participation rate in an activity is sometimes also a policy relevant prevalence measure if there is a high probability of harm associated with consumption or if community norms oppose consumption (such as injecting illicit drugs). However, for legal activities that are widely accepted by the community (such as alcohol use and gambling), governments' main strategy has been to address the risks posed by the activity for those who participate in it, rather than to reduce participation rates per se. (The Australian Government ban of online gaming has been a departure from that strategy.)

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gamble at all in any given year. Accordingly, problem gambling prevalence rates among gamblers are around 25–33 per cent higher than those implied by the adult rates (around 0.9 per cent for CPGI 8+ and 3.0 per cent for CPGI 3+ — table 5.4).<sup>19</sup>

Assessing risks for only those engaged in gambling is also important in understanding adult prevalence rates, as participation in gambling has been falling (chapter 2). This means that even if the risks associated with gambling had remained unchanged, the prevalence rate among the entire adult population could be expected to have fallen.

### *Regular gamblers face much more elevated risks than non-regular gamblers*

In some areas of public health, the distinction between regular and irregular use is not very relevant. In smoking, for instance, around 82 per cent of users smoke daily and more than 90 per cent at least weekly (AIHW 2007, p. 4).

However, in gambling, truly regular play is relatively rare. Once the statistics remove those people whose regular gambling consists of ‘scratchies’, Lotto or other lotteries (activities shown to generally pose few harms), only an average of 12 per cent of adults gamble weekly or more (table 5.5). They gamble on a variety of forms, such as racing, gaming machines, keno and (to a much lesser extent) casino table games. Problem gambling rates are much higher in this group, averaging around 8 per cent using the CPGI 8+ criterion and around 22 per cent for the combined categories of moderate-risk and problem gamblers.<sup>20</sup>

So, though problem gambling is indeed low in the total adult population, it is pronounced among those who gamble regularly.

### *Some forms of gambling are riskier than others*

Different gambling forms pose varying risks for people, with gaming machines posing the greatest problems (chapter 4). Around one-third or less Australians play gaming machines in any given year.

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<sup>19</sup> If non-gamblers (NG) comprise around 25 per cent of the adult population (A), then this means that the ratio of problem gamblers (PG) to gamblers (G) would be  $PG/G = PG/[(1-0.25) \times A] = 1.33 PG/A$  or 33 per cent higher than the adult population prevalence rate. If NG comprises around 20 per cent of the adult population, then the prevalence rate of problems for gamblers would be 25 per cent higher than the adult prevalence rate.

<sup>20</sup> It is important to note that estimates of problem gambling prevalence rates among the adult population, non-Lotto regular players and regular EGM players come from an overlapping, but not identical set of prevalence surveys. As a consequence, care has to be taken in comparing one set of results with the others.

**Table 5.4 Prevalence of problem gambling among gamblers**

Australia, 1995–2009<sup>a</sup>

<i>Jurisdiction</i>	<i>Year</i>	<i>Gambling share of the population</i>	<i>SOGS 5+</i>	<i>SOGS 5-9</i>	<i>SOGS 10+</i>	<i>CPGI 3+</i>	<i>CPGI 3-7</i>	<i>CPGI 8+</i>
		%	%	%	%	%	%	%
Australia	1999	81.5	2.54	2.14	0.41	..	..	..
NSW	1995	80.1	3.23	2.45	0.78	..	..	..
NSW	1997	73.0	4.25	3.62	0.62	..	..	..
NSW	1999	80.4	3.18	2.77	0.41	..	..	..
NSW	2006	69.0	..	..	..	3.93	2.55	1.37
NSW	2009	69.6	..	..	..	2.44	1.87	0.57
VIC	1996	87.0	0.86	0.69	0.17	..	..	..
VIC	1998	76.0	1.97	1.58	0.39	..	..	..
VIC	1999	81.1	2.64	2.21	0.43	..	..	..
VIC	1999	81.0	0.99	0.86	0.12	..	..	..
VIC	2003	77.4	1.46	1.06	0.39	2.42	1.17	1.25
VIC	2008	73.1	..	..	..	4.19	3.23	0.96
ACT	1999	79.9	2.58	2.50	0.08	..	..	..
ACT	2001	72.9	2.63	2.01	0.62	..	..	..
QLD	1999	85.7	2.20	1.75	0.45	..	..	..
QLD	2001	84.9	..	..	..	4.15	3.18	0.98
QLD	2003	80.3	..	..	..	3.15	2.46	0.69
QLD	2006	75.3	..	..	..	3.09	2.46	0.64
QLD	2009	74.7	..	..	..	2.62	2.12	0.50
NT	1999	79.5	2.37	2.25	0.12	..	..	..
NT	2005	73.0	1.46	1.16	0.31	2.77	1.89	0.87
SA	1996	79.0	1.57	1.15	0.42	..	..	..
SA	1999	76.6	3.20	2.25	0.95	..	..	..
SA	2001	75.6	2.49	1.99	0.50	..	..	..
SA	2005	69.6	..	..	..	2.36	1.74	0.62
Tas	1994	72.0	1.25	0.65	0.60	..	..	..
Tas	1996	89.0	3.34	2.07	1.27	..	..	..
Tas	1999	77.2	0.57	0.57	0.00	..	..	..
Tas	2000	81.8	1.10	0.80	0.30	..	..	..
Tas	2005	72.2	1.95	1.70	0.25	2.43	1.42	1.01
Tas	2007	71.6	..	..	..	1.89	1.17	0.72
WA	1999	84.3	0.83	0.83	0.00	..	..	..
Average	..	77.9	2.12	1.70	0.42	2.95	2.10	0.85

<sup>a</sup> See note in table above. It should also be noted that the definition of gambling sometimes varied among jurisdictions, though it typically excluded raffles. The averages for CPGI measures are more likely to be representative of current prevalence rates since the studies concerned were more recent, and will be less affected by any trends in rates. We excluded the 2007 Victorian study since the gambling share was not known. Based on what is known about that share, if included, it would slightly increase the average results for CPGI estimates.

Source: Based on PC calculations and data from Australian prevalence studies.

**Table 5.5 Problem gambling prevalence among regular gamblers**

Various jurisdictions 1995–2009<sup>a</sup>

Jurisdiction	Year	Regular (non-Lotto) gamblers				Regular EGM players			
		Share of adults	SOGS 5+ rate	CPGI 8+ rate	CPGI 3+ rate	Share of adults	SOGS 5+ rate	CPGI 8+ rate	CPGI 3+ rate
		%	%	%	%	%	%	%	%
Australia	1999	17.1	8.2	..	..	4.3	22.6	..	..
NSW	1995	11.4	17.6	..	..	5.9	..	..	..
NSW	1997	14.5	14.3	..	..	10.0	..	..	..
NSW	1999	19.7	10.2	..	..	5.6	24.9	..	..
NSW	2006	9.3	..	10.2	29.2	5.0	..	15.9	36.8
VIC	1996	..	..	..	..	..	..	..	..
VIC	1998	..	..	..	..	..	..	..	..
VIC	1999	15.8	9.1	..	..	4.5	27.2	..	..
VIC	1999	..	..	..	..	..	..	..	..
VIC	2003	6.2	20.4	15.6	30.2	2.7	31.3	33.0	48.7
VIC	2008	4.1	..	9.0	25.8	1.6	..	16.4	35.4
ACT	1999	24.3	8.5	..	..	4.6	18.5	..	..
ACT	2001	9.9	19.4	..	..	5.2	22.5	..	..
QLD	1999	16.6	6.0	..	..	4.1	14.7	..	..
QLD	2001	..	..	..	..	..	..	..	..
QLD	2003	..	..	..	..	4.3	..	7.2	23.4
QLD	2006	6.8	..	4.9	15.8	3.9	..	7.3	19.6
QLD	2009	5.6	..	5.7	19.4	3.5	..	6.8	23.0
NT	1999	11.4	8.6	..	..	2.9	39.5	..	..
NT	2005	..	14.3	8.5	26.9	9.1	..	..	..
SA	1996	..	..	..	..	..	..	..	..
SA	1999	15.9	14.2	..	..	3.7	14.6	..	..
SA	2001	18.1	10.4	..	..	4.4	..	..	..
SA	2005	9.4	..	3.8	13.8	3.3	..	7.4	20.6
Tas	1996	..	..	..	..	1.7	..	..	..
Tas	1999	12.2	..	..	..	0.7	15.9	..	..
Tas	2000	6.4	..	..	..	2.2	..	..	..
Tas	2005	5.7	..	..	..	1.8	41.0	31.0	45.0
Tas	2007	7.5	..	6.9	18.0	1.6	..	19.3	26.9
WA	1994	16.3	3.4	..	..	..	..	..	..
WA	1999	16.1	2.6	..	..	0.6	0.0	..	..
SA	2007	..	..	..	..	..	..	9.3	25.5

<sup>a</sup> Regulars are defined as weekly players on at least one non-lottery form of gambling (including scratchies). However, in some cases, regulars include people whose cumulative frequency of gambling on non-lotto forms was 52 times or more per year, or who spent over a certain (high) threshold.

Source: Based on PC calculations and data from Australian prevalence studies.

Indeed, in the most recent Australian prevalence survey, undertaken in Victoria in 2008, only 21.5 per cent of adults played gaming machines in the last year (Hare 2009.) And, only around 4 per cent of Australian adults play weekly or more.

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Accordingly, weekly gaming machine gambling is rare (albeit a substantial source of revenue for clubs and hotels).

Yet, depending on the survey source, problem gambling rates among regular EGM players lie between 7 and 31 per cent (an average of over 15 percent).<sup>21</sup> And, if moderate risk gamblers are included, the range is between 20 and 45 per cent (an average of 30 per cent). Given the current Australian adult population, this implies around 600 000 regular EGM players, with around 95 000 problem gamblers among this group, and a further 95 000 people at moderate risk. This highlights a continuing theme in this and the last chapter — risks should be appraised for the most exposed groups.

There is one important qualifier to these prevalence estimates. They suggest that the numbers of problem gamblers playing regularly on gaming machines is around the same as moderate-risk gamblers playing regularly on gaming machines. In contrast, there are around twice as many moderate-risk gamblers as problem gamblers when overall prevalence estimates are considered.

- this mainly appears to reflect the fact that one set of estimates relate only to regular gaming machine play, and the other to all gambling. Someone can be a problem or moderate-risk gambler and not play regularly on gaming machines.
- the estimates of the prevalence of problems among regular gaming machine players are derived from a smaller group of studies, reflecting data limitations. However, this effect does not appear to be large.

Another corollary of the problem gambling prevalence rates among regular EGM players is that there is high likelihood of encountering problem gamblers in gaming venues — an issue partly explored in the preceding chapter. This is because there is a higher likelihood of encountering a regular player in a venue and regulars have a higher propensity to be problem gamblers. In other words, while problem gamblers may account for only 0.7 per cent of the total adult population, they may account for between 10 and 40 times this among gaming venue patrons at any one time. This has been borne out by the prevalence rates found when venue-based surveys are conducted (Blaszczynski et al. 2001; Caraniche 2005).

It should be emphasised that the above figures do not necessarily mean that gaming machines caused the problem gambling in all cases. For instance, a person might have gambling problems associated with racing, and yet play gaming machines regularly. However, drawing on strands of evidence from many sources suggests that gaming machines *are* the likely source of most gambling problems in Australia:

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<sup>21</sup> With the range based on the 10 and 90 percentile values.

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- the evidence from counselling agencies shows that around 80 per cent of presentations relate to problems on gaming machines
  - the available evidence on help services suggest that problem gambling rates are lower in Western Australia (which has only destination gambling) than other jurisdictions and lower problems among women in particular
  - the greater the extent of the problem, the more likely it is related to EGMs. For example, in the Queensland 2008-09 prevalence survey, 38 per cent of non-problem recreational gamblers played gaming machines; 69 per cent of low risk gamblers; 80 per cent of moderate risk gamblers and around 90 per cent of problem gamblers. Similarly, in that survey, less than 40 per cent of recreational EGM gamblers played EGMs more than six times a year. The comparative rates were, respectively, around 60, 85 and more than 95 per cent for low risk, moderate risk and problem gamblers who played EGMs. Association is not proof of causation, but these patterns are suggestive
  - around 85 per cent of problem gamblers identified in the 2003 Victorian prevalence survey (using the CPGI 8+ criterion) spent most of their money on gaming machines — consistent with this being the problematic gambling form for them. The corresponding figure in the 2008 Victorian prevalence survey was 64 per cent for problem gamblers overall, and 80 per cent for severe problem gamblers (those with a CPGI of 12 or more). The more problems people experienced the more likely were they to specify EGMs as the gambling form on which they spent most (figure 5.3)
  - the 2007 Tasmanian prevalence study asked people about the source of their gambling problems. Sixty two per cent nominated gaming machines, 17 per cent racing, 11 per cent casino table games (with the remaining 10 per cent spread across a range of gambling forms)
  - statistical analysis by the Commission suggested that the odds of having problems when people played gaming machines were significantly higher than racing or casino table games (and all, many times more than lotteries), after controlling for the fact that people often gamble on multiple gambling forms (box 5.3)
  - even if a person has developed a problem on another form of gambling, that makes them vulnerable when gambling on gaming machines, and, in any case, further increases their financial losses from gambling. For example, in the 2007 Tasmanian survey, 93 per cent of problem gamblers who played EGMs made their biggest loss on EGMs

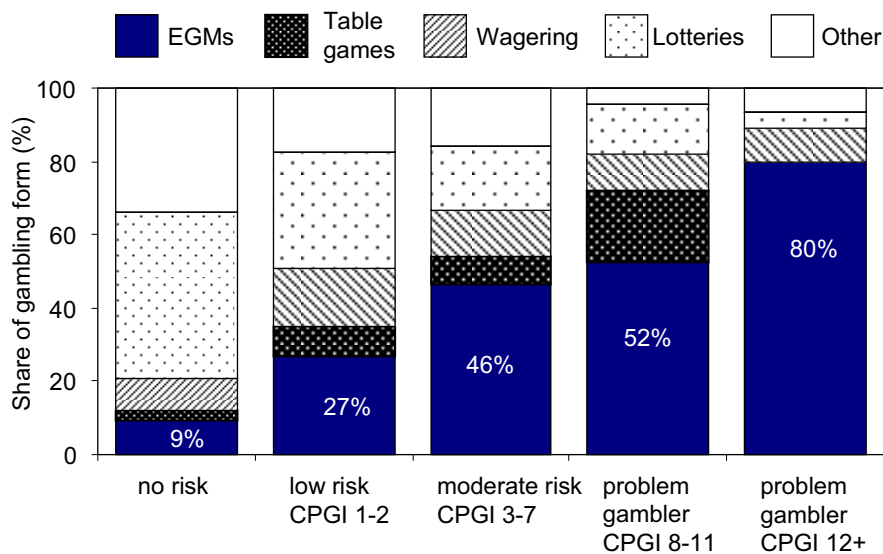
Certain features of gaming machines — the capacity to play alone, the fast pace of gambling, their conditioning impacts, and the much greater tendency for players to

lose contact with reality while playing (chapters 4 and 11) — are likely to explain the greater extent of problems observed for this gambling form.

Notwithstanding the cumulative evidence provided above, Clubs Australia (DR359, attachment, p. 4) argued that there was no objective or empirical evidence that problem gambling is caused by EGMs.

**Figure 5.3 Gaming machines are associated with greater problem gambling risks**

Victoria 2008<sup>a</sup>



<sup>a</sup> Based on Commission analysis of unit record data from the Victorian 2008 prevalence survey (described in Hare 2009). Problem gambling is attributed to the form on which gamblers spent the most money over the last year. For example, 80 per cent of those gamblers with a CPGI score of 12 or more (severe problem gamblers) spent the most on gaming machines. In contrast, less than one in ten gamblers with no risk spent most of their money on gaming machines.

Data source: 2008 Victorian prevalence study.

*The implications*

The much higher public safety risks posed by gaming machines warrant more active community awareness, prevention and harm minimisation measures targeted at this form of gambling than safer forms, such as bingo or lotteries.

In response to the potential for stricter regulations of gaming machines, some parts of the gambling industry have downplayed the need for more policies given the relatively small adult prevalence rate.

Clubs Australia Acting CEO Anthony Ball said while governments have a duty to help the 1% of Australians that gamble irresponsibly, it can't be at the expense of the 99%

of adults who gamble within their means and as a form of entertainment (Media Release, Clubs Australia, 21 October 2009)

The 99% of Australian adults who gamble responsibly as a form of entertainment again will be disadvantaged by the 1% who choose not to seek help with their personal problems. (Terry Condon, Club Managers' Association of Australia, Executive Officer 2009)

### Box 5.3 Gaming machines pose more risks

The Commission has sought, where possible, to triangulate results by using a variety of methods, especially in the light of small relevant sample sizes in some studies. So, in addition to the data on counselling presentations and evidence about certain risky characteristics of gaming machines, the Commission statistically analysed the risks of developing problems on different forms of gambling.

This approach exploited the fact that different people make different gambling choices. Some play on just one form of gambling, others on a few and some on many. If gaming machines pose a particular risk, then problems should be significantly higher for someone who gambles on racing *and* gaming machines than someone who only gambles on racing. Logistic and ordered logistic models were run by regressing the CPGI categories (no risk, low risk, moderate risk and problem gambling) against dummy variables that indicated whether a gambler played gaming machines, lotteries, racing, tables games (or other gambling types, which was reflected in the constants in the regression).

In the three datasets used, playing gaming machines (at all frequencies) had between a 7 and 17 fold higher risk of problem gambling (using the CPGI 8+ rating) than lotteries. These relative risks are considerably greater than that found between other gambling forms and lotteries. The relative risk, while still high, is lower in Queensland than the other two states, with the reason for this unclear.

Gambling form	Risk of CPGI 8+ from playing this form alone compared to playing lotteries only		
	South Australia	Queensland	Victoria
	Risk ratio	Risk ratio	Risk ratio
Gaming machines	17.5	6.9	13.5
Casino table games	1.9	2.1	1.8
Racing	1.9	1.4	0.6
Lotteries	1.0	1.0	1.0

Source: PC calculations using the 2005 South Australian, 2008–09 Queensland and 2008 Victorian prevalence surveys.

However, the statistics presented are inconsistent with each other. The one per cent estimate relates to the adult prevalence rate, which, in turn, would mean that 99 per cent of the adult population do not have problems. It does not mean, as asserted,

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that 99 per cent of *gamblers* do not face problems. Moreover, the overwhelming source of revenue for clubs is gaming machine revenue (chapter 2) and the policy proposals to which the club movement was responding applied to gaming machines. In that case, the relevant figure to consider is the prevalence rate of problems among their clients — EGM players — which is around three times higher than the adult prevalence rate.

Furthermore, *regular* EGM gamblers are the single most lucrative group for clubs — their ‘best’ customers. (For example, analysis of the unit record data from the 2006 NSW prevalence survey suggests that around 75 per cent of revenue is from EGM players who play weekly or more often.) Among the group of regular EGM players, the relevant prevalence rate is not 1 per cent, but rather 15 per cent (and, to the degree that moderate problems are regarded as policy relevant, 30 per cent for moderate and problem gamblers).

Amity Community Services (sub. DR388, p. 3) also pointed out that it can be important to look at particularly susceptible people and communities when assessing the importance of problem gambling:

The prevalence rate of 1–2% fails to adequately describe the complete picture of problem gambling. In addition, this prevalence rate does not address the higher incidence of problem gambling in vulnerable populations.

Moreover, they noted that, given the ripple effects of problem gambling among a problem gambler’s family, friends and employers, the number of people affected is significantly greater than the number of problem gamblers.

Other data supports this. For example, in the 2007 Tasmanian prevalence survey (SACES 2008b, p. 65):

- 50 per cent of people said they personally knew someone who was experiencing serious problems with gambling
- 6.2 per cent of people identified a close relative with problem gambling, and a further 6.6 per cent identified other relatives, so that 12.8 per cent of the population identified at least one family member with a serious problem. This was similar to results obtained in 2005 (12.2 per cent) and 2000 (12.3 per cent).

The majority of their problems related to gaming machines.

When a full range of prevalence measures and the other measures of harm discussed in chapter 4 are considered, there are grounds for more stringent regulation of less safe forms of gambling, reflecting the changed balance of the benefits to recreational gamblers and the costs to others. Gaming machines are a particular concern — they have a high level of risk if played *and* have higher participation

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rates than racing or table games. This is why EGMs figure prominently as a source of problem gambling.

FINDING 5.2

*About 4 per cent of adults play gaming machines weekly or more often. Around 15 per cent of this group would be classified as problem gamblers, with around an additional 15 per cent experiencing moderate risks.*

## **5.6 Comparison of gambling problems with other public health concerns**

While gambling is a serious social concern, its prevalence is lower than some other contemporary public health concerns, such as smoking, excessive alcohol consumption, and obesity (table 5.6). On the other hand, problem gambling has a higher adult prevalence than heroin use or hospitalisations resulting from traffic accidents.

The fact that gambling problems are more widespread than some other problems and less so than others is not the only consideration when allocating (scarce) resources to help people experiencing difficulties. The key issue is where an incremental dollar delivers the best outcome, which will depend on the costs of the problems being mitigated, the costs of the policies themselves and the effectiveness of the policies. A large and intractable problem warrants fewer resources than a smaller, tractable one.

Electronic gaming machines can be likened to motor vehicles in the sense that changes to technology have the scope to reduce harms cost-effectively. Successful outcomes in some other areas of public health require changes in behaviours, which are often difficult to achieve (such as binge drinking or unhealthy eating practices).

## **5.7 How much do problem gamblers spend (lose)?**

Many of the problems experienced by gamblers stem from them spending (losing) more than they, or their households, can afford, without the usual capacity for self-control that might quickly correct this. In this context, it is not surprising that problem and moderate risk gamblers spend more than people with low or no risks, and, as a result, the share of total spending accounted for by the higher risk group will obviously be greater than the prevalence rate of problem gambling.

**Table 5.6 The prevalence and incidence of public health concerns and selected crimes in Australia**

<i>Health concern</i>	<i>Relevant population prevalence rate</i>	<i>Source ID</i>
	per cent	
<b>Public health concerns</b>		
Obesity <sup>a</sup>	25.0	ABS 2009
Regular smoker <sup>b</sup>	19.0	ABS 2009
Consumption of alcohol at levels considered a high risk to long-term health <sup>c</sup>	3.4	AIHW 2008
Recent use of illicit drugs in last 12 months <sup>d</sup>		
Recent use of ecstasy	3.5	AIHW 2007
Recent use of meth/amphetamines	2.3	AIHW 2007
Recent use of heroin	0.2	AIHW 2007
Gambling problem (CPGI 8+)	0.7	This chapter
Moderate gambling problems (CPGI 3–7)	1.7	This chapter
Hospitalisation rates for road vehicle traffic accidents <sup>e</sup>	0.16	AIHW 2009
<b>Crime in last 12 months<sup>f</sup></b>		
Household break-in	3.3	ABS 2006
Motor vehicle theft	1.0	ABS 2006
Robbery	0.4	ABS 2006

<sup>a</sup> Proportion of population aged 18 and over with a BMI over 30. <sup>b</sup> Proportion of the population aged 18 and over that smokes daily. <sup>c</sup> Proportion of the population aged 14 or over drinking 43 (males) or 29 (females) standard drinks or more per week. The Alcohol Use Disorders Identification Test (AUDIT) provides a more conservative estimate of high risk alcohol consumption. A recent local area survey of Australian women found around 0.4 per cent were rated with AUDIT 13+ or high risk (Daly et al. 2009). <sup>d</sup> Relates to proportion of the population aged 14 and over. <sup>e</sup> Crude rate for population. <sup>f</sup> Proportion of households reporting at least one case of the relevant crime in the past 12 months.

Source: ABS 2009, *National Health Survey: Summary of Results, 2007-2008 (Reissue)*, Cat. no. 4634.0; ABS 2006, *Crime and Safety, Australia*, Cat. no. 4509.0; AIHW 2008, *2007 National Drug Strategy Household Survey, First Results*; Henry G. and Harrison J. 2009, *Serious Injury Due To Land Transport Accidents, Australia, 2006-07*, Injury Research and Statistics Series Number 53, Cat. No. Injcat 129, December, AIHW.

The magnitude of gambling expenditure (losses) relative to the income of problem gamblers is relevant to the harms caused to them and their families, and therefore relevant to the design of effective harm minimisation measures to reduce that spending.<sup>22</sup>

<sup>22</sup> There is no contemporary Australian evidence on this, but a recent Finnish population survey found that people with a SOGS score of 5+ spent around 35 per cent of their personal net income on gambling, while those with a score of 3–4 spent around 30 per cent. The Commission's 1999 survey found that the ratio of expenditure to *household* income for SOGS 5+ gamblers was 22 per cent.

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Moreover, the share of total gambling expenditure accounted for by the higher risk group has several additional implications.

As discussed in the Commission's 1999 report (pp. C.18–C.26), spending by recreational gamblers reveals the positive value of gambling to them — this is the main source of the considerable benefits associated with gambling. However, this is not so for problem gamblers, who regret their spending and find it hard to control their gambling. Their large losses — combined with the adverse social costs of their problems — significantly reduce the net benefits of gambling. This increases the size of the gains from effective policy, provides stronger grounds for more stringent regulations, and may justify the reversal (or weakening) of the usual burden of proof when introducing new regulations (chapter 3).

Two researchers in Canada put it more bluntly:

To our minds, the very legitimacy of government-sponsored gambling hinges on the assumption that a large portion of the revenue does not come from an addicted and vulnerable segment of the population. (Williams and Wood 2004, p. 35)

Moreover, a high spending share by higher risk groups also affects the behaviour and incentives of gambling businesses (and governments as well), which need to be factored into policies and institutional arrangements. A high spending share by problem gamblers:

- weakens the incentives for venues to deal with problem gambling if they are a significant source of their revenue. It is important to emphasise that this does not mean that venue managers are unethical, an issue we take up in chapter 12. However, it implies that the normal ethical imperatives of venue owners and managers need to be buttressed by regulation
- may also weaken the extent to which governments act to aggressively limit problem gambling or its adverse financial effects for gamblers, since gambling taxes and licence fees are an important source of revenue. Again, this does not mean that Australian jurisdictions explicitly set out to 'milk' revenue from problem gamblers. Rather, in the face of the uncertainty about the numbers of problem gamblers and the effectiveness of harm minimisation measures, governments have incentives to be prudent in undertaking radical actions, knowing that policy mistakes would have adverse effects on their budgets.

Most do not contest that the expenditure share is policy relevant. What many contest is its size (Clubs Australia, sub. 164, pp. 80ff; Novak and Allsop, sub. 72, p. 21; Livingstone and Woolley, sub. 259).

The Commission examined the issue on many fronts, given the need to triangulate evidence across different jurisdictions' data sets and methods (appendix B).

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Triangulation provides a test of the credibility of the results, especially since each method (and dataset) has limitations.

The overall evidence for a large expenditure share seems robust and persuasive.

First, data from prevalence surveys on individual playing styles on gaming machines show that problem gamblers play more sessions and for longer than other (recreational) gamblers. There is also some evidence that they are more likely to stake more on each button push, but the evidence here is more equivocal. An in-venue observational study (Blaszczynski et al. 2006) has also found longer duration sessions for problem gamblers, little variation in lines played, and some difference in credits wagered. The inevitable consequence of this playing style is that annual spending by problem gamblers will be a multiple of that of recreational players — many of whom, in any case, play only a few sessions a year.

Second, unit record data from prevalence surveys confirm the implications that frequent and longer duration playing result in very large annual expenditures by problem gamblers — averaging around \$21 000 annually — depending on the method and the year of the study.<sup>23</sup> However, the most important numbers from these surveys are the expenditure shares for different risk groups, which are large for the higher risk groups for all of the estimates produced by the Commission (appendix B and figure 5.4).

The share of total spending accounted for by:

- problem gamblers (those rated as CPGI 8+) was 41 per cent (with the range from the minimum to maximum being 22 to 60 per cent, and with 80 per cent of the estimates being between 27 and 54 per cent)
- moderate risk gamblers (CPGI 3–7) was 19 per cent (with the range from the minimum to maximum being 7 to 27 per cent, with 80 per cent of the estimates being between 10 and 25 per cent)
- higher risk gamblers (the two measures combined or CPGI 3+) was 60 per cent. Even if the lowest estimate for higher risk groups was seen as the most reliable, the share would be 42 per cent. It is important to emphasise that the maximum value of CPGI 3+ is *not* the sum of the maximum values for CPGI 8+ and CPGI 3–7.

These expenditure shares are broadly in line with a range of other estimates. Prevalence studies for the Australian Capital Territory (2001) and the Northern

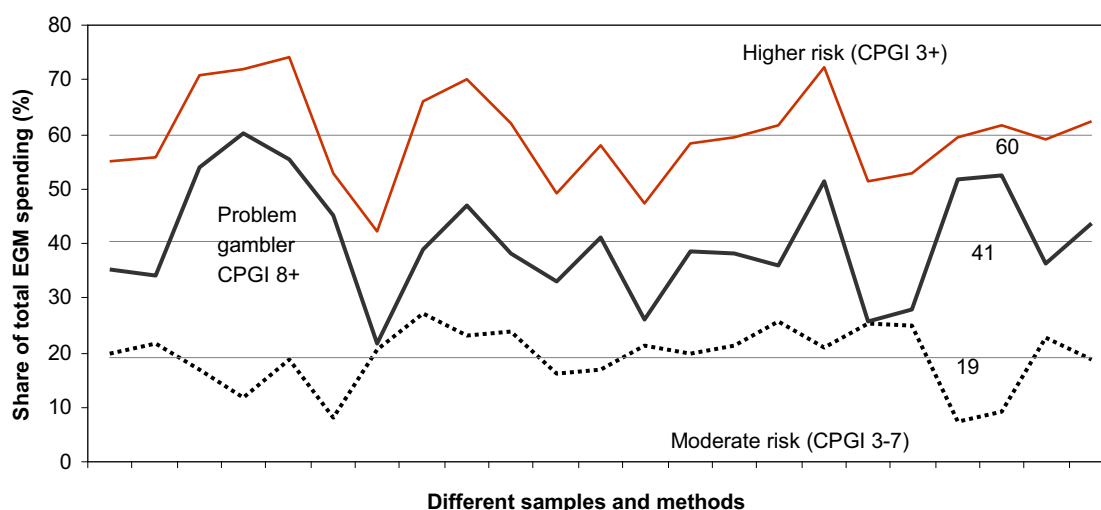
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<sup>23</sup> The results are not based on the Commission's National Survey of 1999 — these do not appear in the table from which the average is calculated (contra Clubs Australia, attach, sub. 359, p. 95 which asserted that the estimate was drawn from the 1999 study).

Territory (2005) found that problem gamblers (SOGS 5+) accounted for 48.2 and 43 per cent of total gaming machine expenditure respectively, with the Productivity Commission’s national estimate in 1999 being 42.3 per cent.<sup>24</sup>

**Figure 5.4 Higher risk gamblers account for a large share of gaming machine revenue**

Australian jurisdictions 2003–2009<sup>a</sup>



<sup>a</sup> The results are from analysis by the Commission of unit record data from seven recent prevalence surveys from South Australia, Victoria, NSW, Queensland and Tasmania. The results update those presented in the draft report — including some minor methodological modifications and the use of data from the 2008–09 Queensland and 2008 Victorian prevalence surveys.

Data source: Appendix B.

In their submission to this inquiry, Livingstone and Woolley (sub. 259) produced indicative numbers suggesting that the CPGI 8+ and CPGI 3+ groups could account for around 29 per cent and 44 per cent of total gaming machine revenue respectively. Using the same underlying dataset, Clubs Australia (sub. 164, pp. 84-85) estimated that the share of spending accounted for by the CPGI 3+ group would be at most around 23 per cent. Both assessments make strong assumptions about a dataset not well suited to such share calculations (appendix B), but those underpinning Livingstone and Woolley’s calculations appear to be more realistic.

Several Canadian studies provide useful insights, since they employed careful methods for recording spending. Williams and Wood (2007) found that about 35 per cent of Ontario gaming revenue was derived from problem gamblers (defined as CPGI 3+) and around 60 per cent of gaming machine spending. (A study in Alberta found similar results — Williams and Wood 2005.)

<sup>24</sup> Based on prevalence surveys by Tremayne et al. (2001, p. 114); Young et al. (2005, p. 46) and PC (1999, p. 7.46).

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Some suppliers have said that the ‘80-20’ rule (80 per cent of the income comes from 20 per cent of the customers) applies to gambling, as it apparently does for many other goods and services. Indeed, data from one major club’s loyalty player data suggested that less than 1 per cent of loyalty card holders — the ‘premium’ players — accounted for around half of the loyalty card gaming turnover. So, the evidence supports considerable concentration in spending. By itself, that would not be symptomatic of spending by problem gamblers.

Indeed, the Australasian Gaming Council (sub. DR377, p. 14) indicated that it is important to acknowledge that recreational gambling is not categorised by low spend alone. The Commission agrees that this is the case and on that basis, we used the CPGI, not spending, to classify recreational gamblers. However, we note that the average spends by recreational gamblers are fractions of those experiencing some level of risk as defined by the CPGI. As spending rises, so too does the risk of problems (appendix B). That implies that while an individual heavy gambler may not be a problem gambler, there is likely to be many problem gamblers among a group of heavy spenders.

#### *Expenditure shares for gambling as a whole*

Estimates of the share of *total* gambling revenue accounted for by problem gamblers are smaller than those found for gaming machines. For instance, the three Australian studies that have attempted such calculations estimate shares of 29 per cent (the Northern Territory 2005), 37.3 per cent (the Australian Capital Territory 2001) and 33 per cent (Australia 1999) for SOGS 5+ groups.<sup>25</sup>

Williams and Wood (2004) found expenditure shares for all gambling in a range of Canadian provinces in the early 2000s ranging from 18.9 to 33 per cent, with an unweighted average of around 28 per cent (based on the CPGI 3+ criterion for problem gambling).<sup>26</sup> A recent Finnish prevalence survey found that the SOGS 5+ group accounted for around 12 per cent of gambling spending and SOGS 3–4, a further 20 per cent (Oy 2007). While the screen used is different, the latter implies a significantly lower share than the Canadian results.

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<sup>25</sup> From Tremayne et al. (2001, p. 114); Young et al. (2005, p. 46) and PC (1999, p. 7.46).

<sup>26</sup> The paper considered a range of other estimates, but these included a measure based on SOGS and a lifetime measure of problem gambling, neither of which was comparable with the other estimates, and have accordingly not been included).

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FINDING 5.3

*It is estimated that problem gamblers account for around 40 per cent of total gaming machine spending (the average of a range of estimates as high as 60 per cent and, most conservatively, as low as 20 per cent). Moderate risk gamblers account for a further significant share.*

## **5.8 Has problem gambling prevalence declined?**

Some participants suggested that problem gambling prevalence rates have declined, while others disputed this. For example, Clubs Australia (sub. 164, p. 85) considered that:

... the latest empirical data shows that the incidence of problem gambling has reduced since 1999. Clubs have contributed to this result through the implementation of responsible gambling programs (Clubs Australia sub. 164, p. 85)

In their submission responding to the draft report, Clubs Australia (attach. sub. DR359, p. 131) claimed that a downwards trend was ‘certain’. The Australasian Gaming Council (sub. 230, p. 33) and UnitingCare Australia (sub. 238, p. 18) were more cautious, suggesting that prevalence rates have probably fallen.

A series of prevalence studies — summarised in table 5.2 — form the basis for the assessment that problem gambling prevalence rates have declined. Unfortunately, these data suffer some limitations for that purpose and need to be carefully interpreted.

### *Sample surveys provide inexact measures*

Prevalence surveys infer the properties of a whole population from a sample of that population. While sample sizes in more recent studies have been much larger than earlier studies, estimates of problem gambling prevalence remain imprecise because the target group is only a small proportion of the population.

For example, the Queensland 2006–07 study was based on a large sample of 30 000 people, but this still meant considerable statistical uncertainty about the prevalence rate. The study found that there was a 95 per cent chance that the prevalence rate of problem gambling (CPGI 8+) was between 0.3 to 0.6 per cent of the adult population (centred around 0.47 per cent) or in approximate number terms, somewhere between 9 000 and 18 000 gamblers — a sizeable margin. In 2003–04, the prevalence rate was estimated at 0.55 per cent — on the face of it, indicating that problem gambling had declined. However, the 95 per cent confidence level on

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that estimate is 0.4 to 0.7 per cent, so that it is possible that the true prevalence rate has remained much the same or potentially even risen (This point has also been made by Doughney 2007 in relation to Victorian prevalence estimates.)

An illustration of this principle is as follows. Take a coin and toss it 10 times, recording the cumulative number of tails. Then do it again and get a new sum. It is likely the totals will be different, even quite different. Clearly that does not mean that the coin tossed the first time around is different from the one tossed in the second case. Yet making that presumption is exactly what is entailed in simply looking at the point estimates from prevalence surveys. That is why it is critical to take account of sampling error.

*Each jurisdiction has 'done its own thing'*

Even where the same screen has been used, different jurisdictions have applied it to different sub-samples (all gamblers, two weekly gamblers, weekly gamblers), and the questionnaires have varied in their content and the order of the questions. Even within the same jurisdiction, different survey methodologies have been used at different times. This may not lead to systematic biases in estimates across time, but it adds non-sampling variation to any estimates.

*The screens used to test prevalence have changed*

Early studies used the SOGS screen, with the definition of a problem gambler as SOGS 5+. More recent studies have used the CPGI screen, with problem gamblers defined as CPGI 8+. Even on an identical population, the two screens give different prevalence estimates (as demonstrated by the three studies that have applied both). Consequently, comparisons over time that fail to distinguish their different scale and bases for measurement are not meaningful. Doing so would be somewhat akin to concluding that the temperature in Australia fell dramatically when measurement switched to Celsius from Fahrenheit. In that context, using unadjusted data (as in figure 4.1 in *Clubs Australia*, sub. 164, p. 86 and repeated in attach., sub. 359, p. 131) to demonstrate a 'certain' downward trend is not valid.

**So can anything be inferred?**

Notwithstanding these various limitations in comparing studies over time, on balance, the Commission's assessment of the evidence suggests that prevalence rates *have* fallen.

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The Queensland data are based on a consistent screen, carefully applied by an expert statistical agency. The data show a steady fall in prevalence rates from 0.83 per cent in 2001 to 0.55 per cent in 2003-04, to 0.48 per cent in 2006-07 and 0.37 in 2008-09. While each of the discrete reductions may not be ‘statistically significant’, the likelihood of finding three successive falls when, in fact, none has really occurred, is low. At least for that state, the evidence for falling prevalence rates is plausible.

The 2008–09 NSW Health survey (which included a gambling module) also shows that problem gambling prevalence may have dropped by around 50 per cent in that state. However, the Commission has been advised that the difference between the prevalence rates is not statistically significant, so the apparent fall may be a statistical quirk. Nevertheless, it adds weight to the possibility that adult prevalence rates may have fallen.

Moreover, the usual test of statistical significance is based on an acute aversion to erroneously concluding there has been a reduction (or a rise), when in fact there has been none. The conventional significance test means that the statistician is only willing to tolerate a five per cent chance of such an error. Nothing says that five per cent is the right threshold test. Therefore, on the basis of the existing estimates and their imprecision, it is *likely* that prevalence rates have fallen in Queensland, even though there remains a possibility that they have not. Without corroboration using an additional and larger survey, or some other sources of evidence, the extent of any change in the NSW problem gambling prevalence rate is much less certain.

*Adjusted prevalence measures also support declining prevalence rates*

By examining the three prevalence studies where both SOGS and CPGI were used, it is possible to estimate the relationship between them. This means that a common measure of problem gambling can be derived, which can be used to assess prevalence trends using a broader set of information than just the Queensland surveys. The adjustment of prevalence rates reflects that CPGI 3+ measures a bigger group of people experiencing problems than SOGS 5+, while CPGI 8+ measures a smaller group.

The adjusted data suggest a downwards trend (figures 5.5 and 5.6).<sup>27</sup> There is even stronger evidence of a decline in the prevalence of problematic gambling if only CPGI measures are considered.<sup>28</sup> Some uncertainty remains because there are

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<sup>27</sup> The adjustment method is explained in the notes to the table.

<sup>28</sup> More formal modelling based on pooling the (more limited) CPGI data suggested that trends in CPGI 3+, CPGI 3–7 and CPGI 8+ were all negative and statistically significant (at the 0.05 level).

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multiple sources of potential error: misspecification of the procedure used to adjust CPGI scores; and sampling and non-sampling errors in the original prevalence data.

Other indicators of trends in the prevalence of specific problematic behaviours are more ambiguous. Table 5.7 shows results for six indicators for five jurisdictions. While the data are incomplete for some jurisdictions, in 8 of the 16 cases there is an upward trend in the presence of problems and a downward trend in the other half. Pooling data from all available prevalence studies provides larger samples. The evidence suggests that self-assessments of whether gamblers have a gambling problem (the one item screen discussed in chapter 7) shows no trend over time (figure 5.7). However, over time there appears to be a lower prevalence of people reporting being criticised about their gambling (or being told they have a problem).

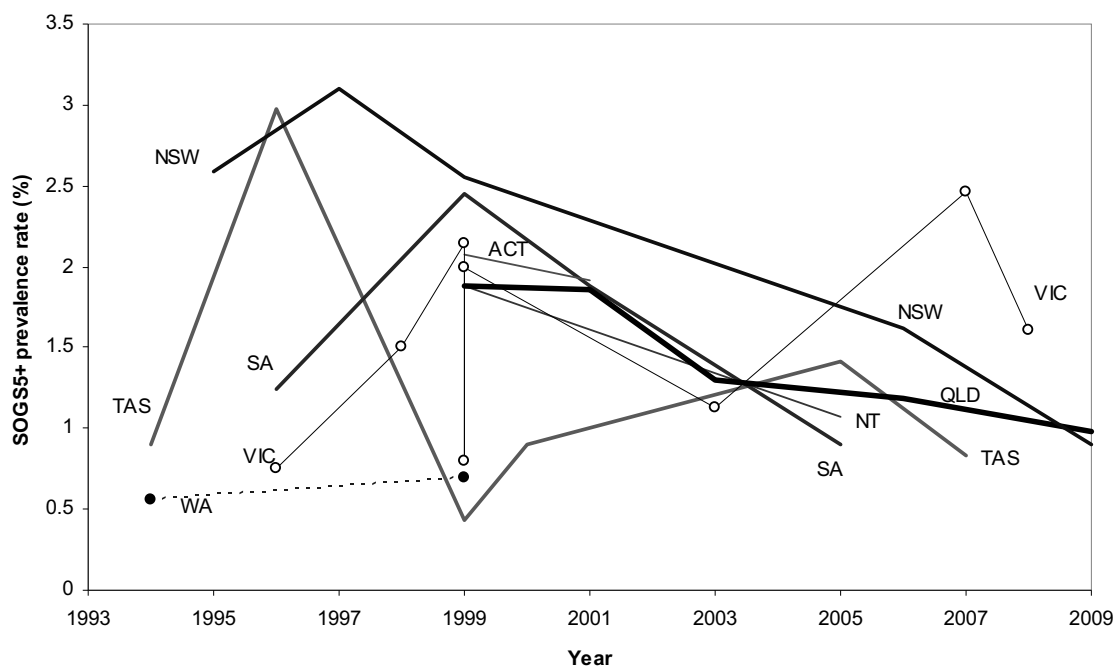
There are other grounds to expect that the adult prevalence rate of problem gambling would fall in the wake of the significant and rapid liberalisation of gaming that occurred in the early 1990s:

- almost all Australians were suddenly exposed to a new form of gambling (gaming machines), and it could be expected that some of these would develop problems
- governments and venues have introduced some prevention and harm minimisation measures, which are likely to have reduced risks of problems for gamblers
- over time, people adapt to gambling and the novelty wanes (as shown by declining participation rates), lowering the proportion of exposed adults. In Queensland, the share of people gambling has fallen, and there has been a more significant reduction of regular EGM playing (the biggest source of problem gambling). As governments and venues make people aware of the problems through community awareness programs, people may also adapt to reduce the risks of their gambling
- many of those who initially developed problems resolve these, and are less likely to repeat the experience — ‘innoculation’ (box 5.4 and figure 5.8).

There is some evidence supporting this model. For example, longitudinal data from New Zealand showed that of those classified as serious problem gamblers in 1991, only one third experienced problems of that severity in 1998 (Abbott 2006).

However, even in the simple model shown in figure 5.8, little is known about the magnitude, stability or determinants of the parameters that lead to the observed prevalence rate. The model suggests that prevalence rates should fall before reaching a floor. But even that ‘floor’ is subject to continuing influences.

**Figure 5.5 Problem gambling prevalence rates<sup>a</sup>**



<sup>a</sup> Problem gambling was measured using the SOGS 5+ criterion. There was only limited data where both CPGI and SOGS were used (three studies in Australia and seven in Canada, and so only a simple adjustment was feasible. The Australian SOGS 5+ prevalence rate was estimated as  $CPGI\ 8+ + 0.394\ CPGI\ 3-7$  (reflecting the fact that all people categorised as CPGI 8+ will be categorised as SOGS 5+, while only a share of those rated as CPGI 3-7 (a looser categorisation of problems) would be rated as SOGS 5+.

*Data source:* Commission estimates based on prevalence estimates from table 5.2.

Changes in gaming technologies and their accessibility, to harm minimisation policies and to the vulnerabilities of the population may further depress it, or, in fact, increase it. As noted by one major researcher in the field: ‘agent, environment, and ‘host’, like rust, never sleep’ (Abbott 2007, p.3). The Victorian longitudinal survey of gambling will help understand these processes better,<sup>29</sup> as may other research targeted at environmental risks and incidence.

<sup>29</sup> The baseline study was conducted in 2008.

**Table 5.7 Other indicators are more ambiguous**

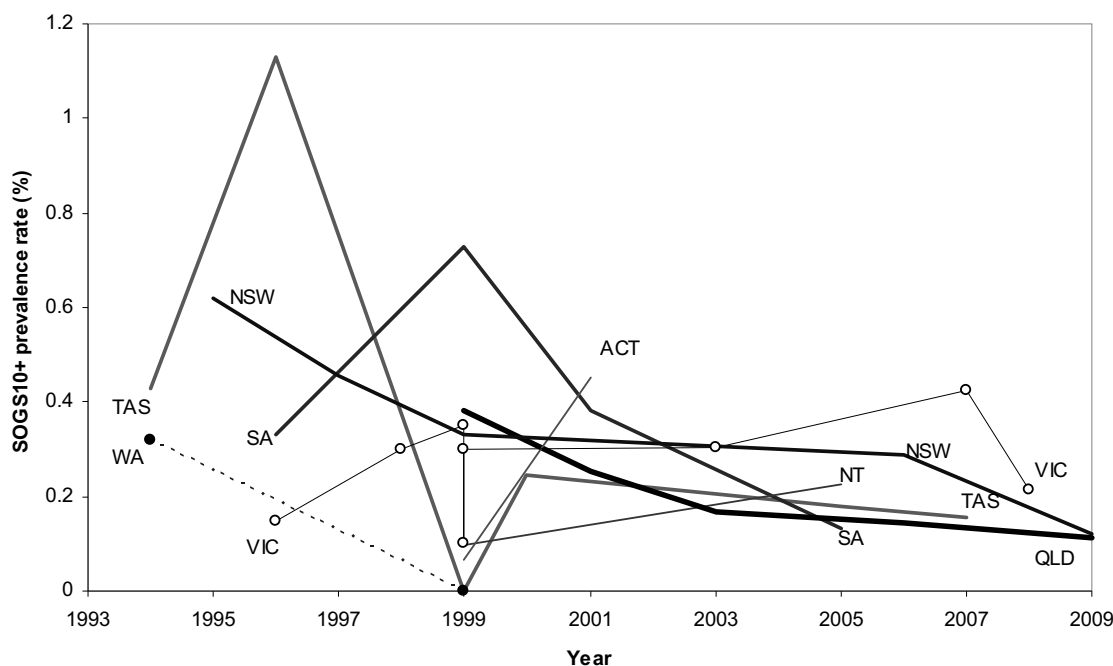
Share of gamblers<sup>a</sup>

		<i>Share of gamblers with gambling issue</i>					
		Wanted help for gambling problems <sup>b</sup>	Tried to get help <sup>b</sup>	Tried to be excluded from venue <sup>b</sup>	Rarely to always felt might have a problem with gambling	Sometimes to always criticised by others for gambling	Often or always Felt guilty
		%	%	%	%	%	%
NSW	1995	..	..	..	2.71	1.89	0.45
NSW	1997	..	..	..	4.46	2.71	..
NSW	1999	..	..	..	2.04	2.50	1.92
NSW	2006	..	..	1.34	2.82	2.01	1.07
VIC	1999	..	..	..	0.93	1.59	0.86
VIC	2003	..	..	..	0.79	0.48	1.27
VIC	2007	..	..	..	..	..	..
VIC	2008	0.51	0.37	..	2.55	0.47	1.22
QLD	1999	..	..	..	0.98	0.59	2.32
QLD	2001	..	..	..	2.47	..	..
QLD	2003	0.50	0.20	0.90	2.10	0.90	0.64
QLD	2006	0.55	0.28	1.14	2.08	1.11	0.66
QLD	2009	0.41	0.23	0.66	1.80	1.07	0.73
SA	1999	..	..	..	1.43	1.31	1.80
SA	2001	..	..	..	0.86	1.73	1.37
SA	2005	..	..	..	1.87	1.01	0.72
Tas	2000	..	..	..	1.22	..	..
Tas	2005	..	..	..	1.52	..	..
Tas	2007	..	..	..	1.49	..	..

<sup>a</sup> These are based on the prevalence studies used in table 5.2, but using answers to specific questions. The advantage of this strategy is that some questions are common to SOGS and the CPGI, allowing easier comparison over time. However, some subtle differences in the questions remain, such as variations in the CPGI and SOGS screens and the sample frame, which will partly affect comparisons between jurisdictions and over time. As an illustration, the Victorian 2008 CPGI asked about people who never, rarely, often, always found themselves criticised (one question in the orthodox CPGI), whereas some other surveys used a five item scale that also included 'sometimes'. In the Victorian case, we used 'often to always' for the response to this question. <sup>b</sup> These questions relate to people who scored at least one on the CPGI.

Source: State and territory prevalence surveys for these years.

**Figure 5.6 Severe problem gambling prevalence rates<sup>a</sup>**

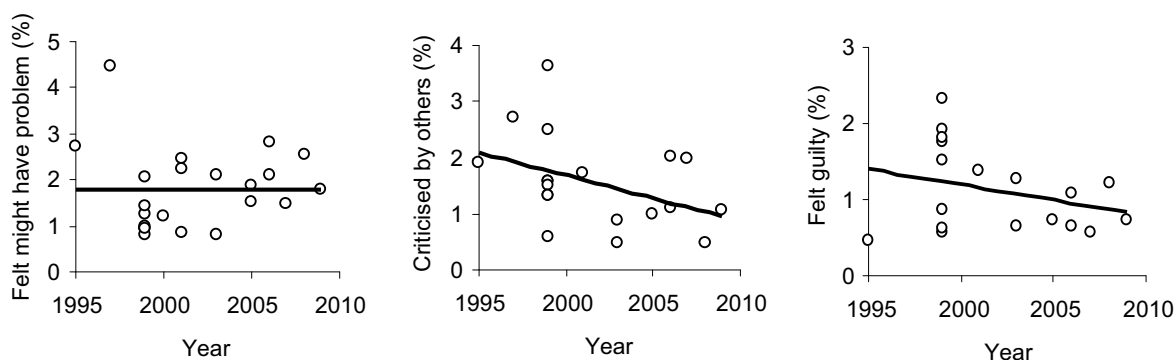


<sup>a</sup> Severe problem gambling rates were measured using SOGS 10+ as the criterion. The SOGS 10+ prevalence rate was estimated as 0.304 CPGI 8+ (reflecting the fact that SOGS 10+ relates to more severe gambling problems than CPGI 8+). The adjustment was only based on the three Australian studies, since the Canadian studies described in the above table did not report a SOGS 10+ score.

*Data source:* Commission estimates based on prevalence estimates from table 5.2.

**Figure 5.7 Pooled data evidence is ambiguous**

Data pooled from Australian prevalence studies, 1995 to 2009<sup>a</sup>



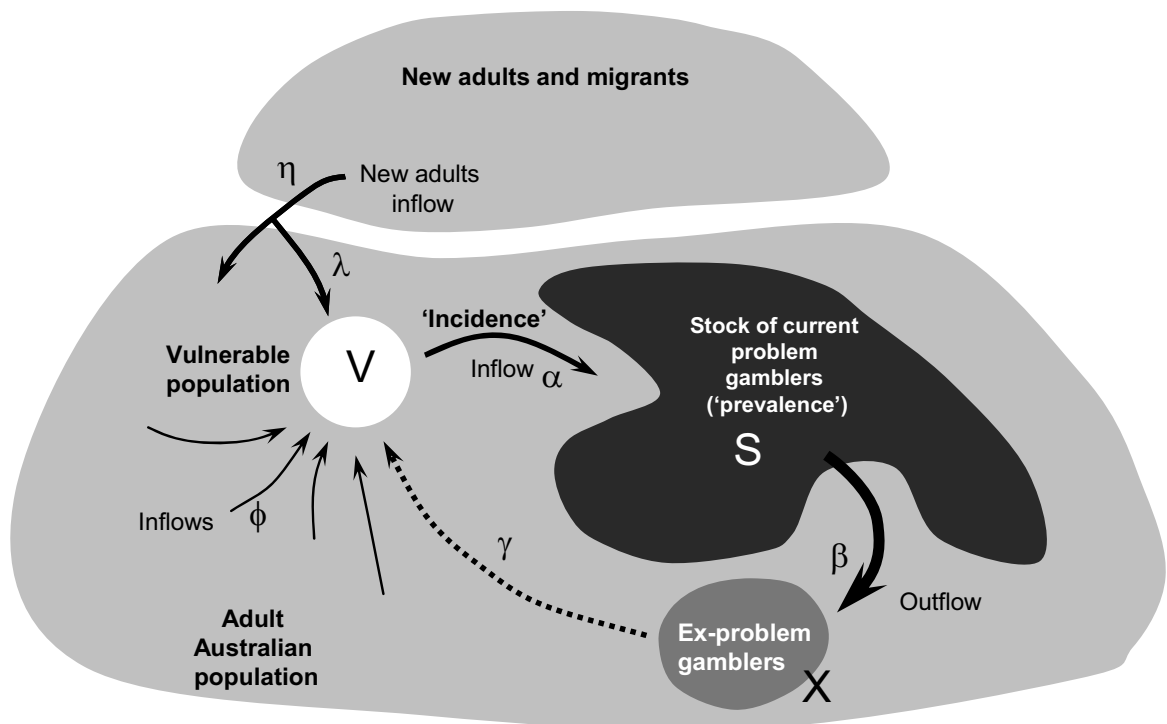
<sup>a</sup> These scatter plots are based on pooled data from all jurisdictions' prevalence surveys, with the exception of data relating to Western Australia (where the gambling environment is quite different from other jurisdictions). The t statistics for the slopes are, from left to right, 0.07, -1.87 and -1.22. This suggests a reasonable probability that the extent to which people are criticised by others (or told they have a problem) has declined over the last 15 years, though the actual precision in the relationship is probably less than shown due to the subtle differences in the survey designs underlying the data.

*Data source:* State and territory prevalence surveys for these years.

While some indicators point to an increase in prevalence rates of problem gambling, the balance of evidence (and theory) suggests that prevalence rates of problem gambling have fallen. However, it is important not to misinterpret this:

- it exaggerates the reduction in risks for the population actually gambling, since some of the reduction in the adult prevalence rates stem from lower participation in gambling generally (section 5.5). The surveys that provide the most compelling evidence for declining adult prevalence rates show minimal declines in problem gambling rates among regular EGM gamblers (Queensland surveys from 2003 to 2009)
- the share of spending accounted for by problem gamblers appears to be very high — with no apparent downward trend
- while harm minimisation and other government policies — such as improved access to counselling services — have probably had an impact, it is hard to assess their importance compared with adaptation
- it does not say anything about the broader sets of problems besetting gamblers more generally (chapter 4), though some evidence suggests these might be falling too — box 5.4

Figure 5.8 **Stocks and flows suggest falling prevalence rates**



Source: Productivity Commission.

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### Box 5.4 People and communities adapt to exposure

Gaming machines are the prime source of problem gambling in Australia. In most jurisdictions, gaming machines were only liberalised in the 1990s, and even though they were legally available in NSW for many years prior to that, the modern 'high intensity' electronic gaming machine was also a recent innovation for that state. As such, the majority of Australian adults were exposed to a new form of gambling. In that context, there would be a large population of vulnerable people (shown as V in figure 5.8). These would include people unfamiliar with the risks of gaming machines, people aged under 30 years old, those with mental health problems, facing boredom, with faulty cognitions, or simply people more likely to respond to conditioning.

At that time, V would have been a sizeable proportion of the Australian adult population. A certain share of this group could be expected to develop gambling problems — becoming part of the stock of people with problems observed at that given time. The stock (S) could be expected to rise over time. First, inflows would increase as participation in a new form of gambling rose, and as there would be likely to be a lag between exposure and development of severe problems (which is what low and moderate risk gambling aims to measure). In addition, the outflow from the stock of problem gamblers would be initially small because problems take some time to resolve (and for some are never resolved).

However, at some point, people could be expected to adapt to gaming machines, reducing the size of the group that is vulnerable and the inflow rate ( $\alpha$ ).

- people would find them less novel and participation rates would fall (which is corroborated in chapter 2). Non-gamblers clearly face no risks
- some people would adapt to the risks or overcome faulty cognitions. (For instance, the Queensland prevalence surveys suggest that there was a significant reduction between 2001 and 2006-07 in beliefs that systems work and that wins and losses come in cycles.)

At the same time, the outflow rate could be expected to rise as people overcome their gambling problems. As a result, the prevalence rate would fall.

Policy and venue practices might contribute to such a lower prevalence rate in several ways. It could:

- accelerate outflow rates ( $\beta$ ) by providing high quality and accessible counselling and treatment services, and by introducing measures such as self-exclusion
- reduce inflow rates into the vulnerable population by making people aware of the risks ( $\phi$ ) and by reducing the inflow rate ( $\alpha$ ) of the vulnerable through harm minimisation measures that address the environmental and contextual risks (for instance, through changes to gaming machine design).

The prevalence rate would not be expected to fall to zero. Each year there would be newly minted adults (a high risk group) and new migrants to Australia who may not have been exposed to as risky a gambling environment. And many people in the population remain or become vulnerable (including relapsing ex-problem gamblers).

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Moreover, the problems that remain are still significant and warrant continued policy action. The absolute numbers of people affected by significant problems are still large — and, as discussed above, larger still when the ripple effects of problem gambling on relatives and friends are considered. Given the framework set out in box 5.4, reductions are unlikely to continue without environmental changes.

FINDING 5.4

*While problem gambling prevalence rates for the adult population as a whole have probably fallen, in relation to the more relevant indicators for policy, there is:*

- *no reliable indication of a significant decline in the rate of problem gambling among regular EGM players*
- *no evidence that the share of total spending accounted for by problem gamblers has fallen.*

The Commission's assessment of prevalence surveys undertaken in Australian states and territories over the past few years is that, notwithstanding debates about the exact numbers affected and the likelihood that adult prevalence rates have fallen, there continue to be significant problems experienced by gamblers. This is not isolated to 'problem gambling' though that is the main thrust of research into prevalence. These problems provide a compelling case for regulatory and other measures aimed at reducing these problems.