ACT Government | Gambling and Racing Commission

Australian National University

Final Report 18 March 2015

GAMBLING EXPENDITURE IN THE ACT (2009): BY LEVEL OF PROBLEM GAMBLING, TYPE OF ACTIVITY, AND SOCIOECONOMIC AND DEMOGRAPHIC CHARACTERISTICS

Final Report

GAMBLING EXPENDITURE IN THE ACT (2009): BY LEVEL OF PROBLEM GAMBLING, TYPE OF ACTIVITY, AND SOCIOECONOMIC AND DEMOGRAPHIC CHARACTERISTICS

18 March 2015

Bryan Rodgers[1]
Tanya Davidson[1]
Francis Markham[2]
Aino Suomi[1]
Eleanor Taylor-Rodgers[1]
Sean Cowlishaw[1,3]

1. Centre for Gambling Research, School of Sociology, Research School of Social Sciences, College of Arts & Social Sciences, The Australian National University
2. Fenner School of Environment and Society, College of Medicine, Biology & Environment, The Australian National University
3. School of Social and Community Medicine, University of Bristol

gambling.research@anu.edu.au

Australian
National
University

This report was funded by the Australian Capital Territory Gambling and Racing Commission.

Acknowledgements

Bryan Rodgers was supported by NHMRC Fellowship No. 471429

Table of contents

Chapter 1: Executive summary

1.0 Background

Spending money is a defining feature of gambling. However, a relatively small proportion of gambling research has investigated the amounts of money spent by gamblers. In Australia around $20 billion is spent on gambling each year. The Australian Productivity Commission (2010) referred to an annual expenditure of $1,147 per adult in 2008-09 with gambling losses representing 3.1% of all household final consumption expenditure for the country.

Information on gambling expenditure in Australia comes from three main sources.

1. *Industry data*. Gambling industries report turnover and expenditure for each state and territory government annually, and this information is collated and released publically as *Australian Gambling Statistics* (AGS).
2. *Individual self-report surveys*. Some specialist gambling surveys ask questions on money spent by individual respondents on a range of activities.
3. *Household self-report surveys*. Australian Bureau of Statistics Household Expenditure Surveys have included gambling expenditure at the household level in the self-report questions on spending.

These different sources have their own strengths and weaknesses. Industry data provide objective measures for particular types of gambling and can be used to chart trends over time. However, they do not include any information on the characteristics of individuals who spend their money on gambling. Self-report information from specialist surveys can include a wide range of data on personal characteristics. However, self-reports can be inaccurate and it is well established that expenditure on certain gambling activities is substantially underreported and some is overreported. Household expenditure surveys are a potentially valuable means of assessing differences in expenditure both within and between households, but their use to date has been very limited. They, too, are constrained by underreporting.

1.1 Objectives

This study has two main objectives. The first involves estimating the share of gambling expenditure contributed by different subgroups in the population, using data from the 2009 ACT Gambling Prevalence Survey. The second involves comparing self-reported and industry expenditure figures for the approximate same period of time, i.e. 2009-10.

The specific aims for this project are as follows.

1. To disaggregate expenditure across:
    - level of problem gambling;
    - type of activity; and
    - socioeconomic and demographic subgroups.
    - Across subgroups we report aggregate expenditure representative of the ACT population as well as average and proportional expenditure.

2. To compare the survey and industry data on specific activities and across all activities for the ACT population:
    - exploring whether prevalence survey data can be compensated to match industry data; and
    - evaluating the impact of compensation on the estimates of expenditure shares.

1.2 Methods

The 2009 ACT Survey contacted 5,500 adult residents of the ACT who were invited to complete computer assisted telephone interviews (CATIs). Of these, 2,089 completed longer and more detailed interviews covering their gambling over the previous 12 months. The information from this sample can be weighted to provide estimates for the ACT adult population at that time. Expenditure data used in this report comprise total net expenditure (i.e. losses) across all types of gambling, and net expenditure on the six most common activities: lottery, electronic gaming machines (EGMs), horse and greyhound races, scratch tickets, table games at a casino, and sports and special events.

To estimate net expenditure shares across levels of problem gambling, respondents were grouped according to their scores on the Problem Gambling Severity Index (PGSI), the most commonly used measure of problem gambling internationally in recent years. A score of 0 indicates a non-problem gambler, 1-2 indicates a low-risk gambler, 3-7 indicates a moderate risk gambler and 8+ indicates a problem gambler. The last two groups are often combined in research studies to give a group of moderate risk/problem gamblers (PGSI 3+). The proportion of total population expenditure which is attributed to people with gambling problems is known as the Problem Gambling Expenditure Share (PGES). Estimates of PGES obtained worldwide are summarised in Chapter 2 of this report.

We adopted a parallel approach in order to estimate net expenditure shares for socioeconomic and demographic sub-groups in the population. The share of overall net gambling expenditure, and net expenditure on individual gambling activities (e.g. lottery), were estimated for (i) men and women, (ii) people in different age groups, (iii) people who were not married or living with a partner (and those who were), and (iv) people with different levels of education. From this, we establish whether a sub-group contributes a disproportionately large amount or a disproportionately small amount to the population's spending on gambling overall or on a particular gambling activity.

The findings from previous relevant research are summarised in Chapter 2 of this report. The share of gambling expenditure attributable to problem gamblers varies considerably across different studies. Some of this variation arises from different methodologies used to identify problem gamblers. There are also considerable differences across jurisdictions and the type of gambling products available in different locations. In spite of these variations, it is evident that people with gambling problems spend a lot more on gambling than gamblers who do not report problems; between 6 and 23 times the amount of money on average. Problem gambling expenditure shares are particularly high for certain gambling activities, including EGMs and video lottery terminals (VLTs), casino games and races, and are lower for other activities, such as national lotteries, bingo, scratch tickets and raffles. Examples of high values for EGMs include the Productivity Commission's estimate from 1999 that 42% of EGM expenditure in Australia was derived from the 2% of people who scored five or more on the South Oaks Gambling Screen. More recently, in 2011, 48% of EGM expenditure in Tasmania was estimated to come from the 3% of the population that scored three or more on the PGSI (the same measure used in our ACT survey).

Previous studies have not estimated expenditure shares for socioeconomic and demographic sub-groups in the population but findings have been reported for average expenditure by gamblers with different characteristics. We know that men, on average, spend more than women on gambling, both overall and for many specific gambling activities. Generally, older people spend more than younger people and those with less education spend more than people with more education. Patterns of spending for people living in different types of households are not so clearly identified in the current research literature.

1.3 Gambling expenditure shares in the ACT

Chapter 4 of the present report details our findings for net expenditure by people with different levels of problem gambling. Gamblers with PGSI scores of three or more (moderate risk/problem gamblers) accounted for 27% of reported losses even though they represent only 2% of the ACT adult population. Extending the analyses to those who scored one or more on the PGSI, 55% of all gambling revenue was derived from the 5% of the population that has some level of gambling problem. The proportion of losses attributable to people with problems varied considerably across different activities. Just 5% of losses for lottery came from moderate risk/problem gamblers compared with 10% for scratch tickets, 20% for casino table games, 24% for horse and greyhound races, and 41% for both sports betting and EGMs. People who reported any level of problem gambling (PGSI 1+) accounted for 58% of losses for sports betting, 66% for casino table games, 71% for races and 72% for EGMs.

Chapter 5 presents the findings for spending by socioeconomic and demographic sub-groups. Disproportionately high losses were from men, single people, and those with lower levels of education. Losses were fairly evenly spread across age groups when spending was considered for all types of gambling combined. Again, the pattern of losses varied considerably across different types of activity. Buying scratch tickets was the only major gambling activity where women and men in the ACT spent similar amounts, whereas men accounted for over 90% of losses on sports betting, casino table games, and races. Younger adults contributed disproportionately large amounts to casino table games and sports betting whereas older people contributed more to lottery and scratch tickets. The 25-44 age group accounted for the greater part of expenditure on races. Single people generally lost more money on gambling than those who have a spouse or partner, but lottery and scratch tickets are exceptions to this pattern of spending.

The most striking differences found for gambling losses are seen in relation to education. Net expenditure across all activities by people without either Year 12 education or post-school qualifications is more than four times that of people with degrees. For EGMs and betting on sports and special events, the differences are even greater with the least qualified losing 6 to 7 times the amount of people who have degrees.

1.4 Comparing survey and industry data

Chapters 6 and 7 outline the methodology used to compare gambling industry figures provided by AGS for the ACT with the self-reported survey information from 2009 and present findings on the underreporting of certain types of expenditure. Estimated aggregate losses for EGMs and for casino table games were considerably less from the 2009 ACT Survey compared with AGS industry figures. These differences were used to derive compensation factors for both activities which could then be used to weight the survey data appropriately. This led to a second approach for estimating problem gambling expenditure share and shares for population sub-groups based on the greater weighting given to EGM and casino losses. These changed the estimates a little,

typically increasing the shares attributable to people with gambling problems, and to women, younger people, single people, and those with lower education.

Additional analyses are presented in the Appendix of this report. These repeated all of the analyses presented in the main chapters but used net expenditure measures that had been "Winsorised" (also referred to as "capped"). This technique is used to see whether extreme reports of net expenditure (both wins and losses) might bias the general findings. Overall, the findings from these capped analyses were very similar to those obtained from the original survey self-reports. The different statistical methodologies used in this report, including the compensation strategy to adjust for underreporting and the capped analyses, provide confidence of the robustness of our findings and underline the value of research using self-reported data on gambling expenditure.

1.5 Conclusions

This report has demonstrated how gambling revenue is not drawn evenly from different sections of the ACT population. Far more money is derived from those with gambling problems than from gamblers who do not report problems. More comes from men than women, and there is a striking gradient in that losses are much higher for people with lower levels of education. These patterns are more prominent for certain types of gambling than others. The very high shares of net expenditure from people with gambling problems are most evident for EGMs, sports betting, races, and casino table games. Losses on EGMs show the greatest proportion of revenue being derived from the least educated section of the community.

The findings of this study need to be replicated for other parts of Australia and in areas that provide a different mix of gambling products. The methodology of future research can also be enhanced by including other approaches for assessing the gambling expenditure of individuals in a range of settings. Continued advances in methodology are fundamental to healthy, developing fields of research. There has been a notable trend in Australia to minimise the collection of self-report data on gambling expenditure and it is essential to reverse this trend.

Chapter 2: Introduction

2.0 Background

Across the many diverse forms of gambling activity, a universal feature is that gamblers spend money and that, on average, they lose money. This is so obvious that it seems hardly worth drawing attention to, but for all its fundamental importance, a relatively small proportion of gambling research has investigated the amounts spent. The issue has not been forgotten conceptually, however. The Australian Productivity Commission (2010) used expenditure to define gambling:

> *"gambling is an entertainment based on staking money on uncertain events driven by chance, with the potential to win more than staked, but with the ultimate certainty that gamblers as a group will lose over time"* (p1.4).

Furthermore, the amount of money gambled in Australia is substantial and comparable to population expenditure on alcohol consumption. For instance, the same Productivity Commission (2010) report estimated national total expenditure on legal forms of gambling at $19,042 million for 2008-09. This total was the equivalent of $1,147 per adult and represented approximately 3.1% of all household final consumption expenditure for Australia (Table 2.1, p2.3).

2.1 Sources of gambling expenditure data in Australia

In Australia, information about gambling expenditure comes from three main sources. First, gambling industries are required to report turnover and expenditure to each state and territory government. The national gambling expenditure estimates described above, as cited by the Productivity Commission, represent the sum of state and territory expenditure. Second, some self-report specialist gambling surveys ask questions about money spent and lost by individual respondents, including a number of state and territory gambling prevalence surveys and the national survey conducted for the first Productivity Commission (1999) report. Third, the Australian Bureau of Statistics' Household Expenditure Surveys have collected self-report data on gambling expenditure at the household level. Information obtained from each of these three sources has its particular purposes, advantages and disadvantages.

Industry-reported data

Information on gambling industry turnover and expenditure across states and territories is collected on an annual basis, largely for taxation purposes, and is released in a publicly available report called Australian Gambling Statistics (AGS: Australian Gambling Statistics, 2015). For these annual reports, turnover is defined as:

> *"the amount wagered. This does not include any additional charges that may also be paid at the point of purchase, such as selling agents' commission in the case of lotteries (except where noted in tables)"* (Australian Gambling Statistics, 2015: p6).

Expenditure is defined as:

> *"the net amount lost or … the amount wagered less the amount won, by people who gamble. Conversely, … it is the gross profit … due to the operators of each particular form of gambling"* (Australian Gambling Statistics, 2015: p3).

The particular strength of industry data is in providing an objective measure of losses at a population level, which can be expressed as total or per capita expenditure (using the population aged 18 or over as the denominator). These data have been the cornerstone of research and reporting on historical development of the gambling industry. The measure of national total expenditure has been used to chart the expansion of the gambling industry over recent decades, showing a rapid increase from around $2 billion per annum at the start of the 1980s to $11.3 billion by 1997-98 (Australian Gambling Statistics, 2014). Even with adjustment for CPI, expenditure more than tripled in 20-year periods covering the 1970s through 1980s (Productivity Commission, 1999) and the 1980s through 1990s (Productivity Commission, 2010). Annual growth has since slowed with national total expenditure in real terms reaching a peak in 2006-07. The most recent figures at the time of writing (2012-13) placed national total expenditure just below $20.7 billion (Australian Gambling Statistics, 2014) representing $1,167 per adult. Total expenditure and per capita total expenditure in real terms (i.e. adjusted for CPI) have declined over recent years and were, respectively, 3-4% lower and 15-16% lower in 2012-13 compared with the historically high values reported for the early years of the current century.

Industry data for the ACT present a similar pattern, but the recent declines in expenditure have been steeper than the national figures. Total ACT expenditure in real terms fell over 25% from the historical high of 2003-04 to 2012-13 when $242.7 million was reported. Real per capita expenditure for the territory fell by almost 38% between 2000-01 and 2012-13. It should be noted that these figures are based on expenditure within the territory rather than expenditure by residents of the territory, so part of the decline could reflect ACT residents spending more in other jurisdictions.

The revenue for states and territories through gambling taxation has mirrored the patterns seen in national total expenditure, reaching around $5.5 billion in 2011-12 and 2012-13 (Australian Gambling Statistics, 2014). In real terms, recent government revenue was about 5% lower compared with 2006-07. In the ACT, government revenue in real terms has declined over a longer period and fell by 38% between 1999-2000 and 2012-13.

Historical changes can be delineated for other individual jurisdictions and can be disaggregated across different forms of gambling. This shows that gaming machines were responsible for a large part of the general rises in expenditure and in government taxes during the 1980s and 1990s and of more recent declines in expenditure and revenue. National gaming machine expenditure peaked in real terms in 2004-05 and one year earlier in the ACT.

It is important to note that industry data are not comprehensive across all types of available activities. This is because industry data reflect gambling turnover and expenditure occurring within the geographical boundaries of the states and territories, rather than the expenditure of individuals residing in jurisdictions. For instance, it is not possible to report expenditure on internet gaming (casino-type games played on the internet) because there are no internet gaming providers based in Australia. Information on sports betting is similarly limited or not available at all for many jurisdictions, including the ACT. The other major shortcoming of industry data is that they do not include information on the characteristics of individuals who spend their money on gambling. Currently, such information needs to be sourced from self-report surveys.

Self-report survey data

In Australia, self-report surveys assessing gambling expenditure include the specialist gambling prevalence surveys conducted within individual states and territories and the ABS Household Expenditure Surveys. In Australia only two specialist national surveys have been conducted. The Productivity Commission (1999) completed the first national survey in 1999 and Gambling Research Australia recently released findings from a second national gambling survey in 2014 (Hing *et al.*, 2014). To date, data on expenditure collected for the latter survey have not yet been reported. The ABS has also included measures of gambling participation in

its Population Survey Monitor series but these did not include reports of expenditure (Australian Bureau of Statistics, 1999).

A major advantage of survey data is that a wide range of information can be obtained about individual people, so that expenditure can be investigated in relation to personal characteristics. Self-report surveys currently provide the only means of understanding the variability in expenditure across community subgroups (e.g. by gender, age, cultural heritage, education and income). Potentially, household expenditure surveys could also provide information on variability in gambling expenditure across households with different characteristics. In practice, however, the data are often reported in relation to the characteristics of one member of the household only, i.e. the key informant.

2.2 Problem gambling expenditure share

One of the identifying features of problem gambling is excessive expenditure of money on gambling. This is reflected in the DSM-5 diagnostic criteria for a "gambling disorder", i.e., gambling increasing amounts of money and "chasing losses" (American Psychiatric Association, 2013). Individuals with gambling problems will spend disproportionately high amounts of money on gambling compared with gamblers who do not have problems. A method of quantifying this disproportionate expenditure of people with gambling problems is the estimation of the *problem gambling expenditure share* (PGES). This represents the proportion of national or regional expenditure derived from people with gambling problems and is crucial in understanding the amount of money that is spent by those experiencing significant problems.

The Productivity Commission (1999; Appendix P) used self-reported gambling expenditure from its national survey in order to estimate the PGES for Australia. At that time, the definition of problem gambling covered those identified by the South Oaks Gambling Screen (SOGS) as having a severe or a moderate gambling problem (i.e. score of 5+). The expenditure share of people with gambling problems for different types of betting was estimated at 42.3% for gaming machines, 33.1% for wagering, 19.1% for scratch tickets, 5.7% for lotteries, 10.7% for casino table games, and 25.0% for other forms of gambling.[1] With some additional assumptions, the problem gambling expenditure share for overall gambling losses was estimated at around 29% (Table P.5) to 33% (Table P.6) whereas the prevalence of problem gambling (SOGS 5+) was estimated at just 2.1%.

Internationally, estimates of PGES have ranged from 6.3% to 41.2% when the prevalence of problem gambling has ranged between 0.5% and 5.5%, as summarised in Table 2.1. Even when estimates of the prevalence of problem gambling are adjusted to exclude non-gamblers from the denominator, they are still well below the percentages of expenditure attributable to gamblers with problems (column 4). The table summarises all identified studies reporting the proportion of money spent on gambling by individuals with significant problems in Australia, US, Canada, and New Zealand. The table includes estimates of PGES for expenditure across different types of activity and of PGES across all activities collectively, where available.

1. This included keno, bingo, sports betting, internet games, and other, but excluded private games for money and raffles.

Table 2.1: Proportion of expenditure from individuals with gambling problems across types of gambling activity.

Study	Population	PG preval. + measure of PG %	All activities %	Scratchies %	Lotto/lottery %	Races %	Casino %	Slots/EGMs %	VLT %	Bingo %	Sports %	Other %
National prevalence surveys												
Productivity Commission (1999)	Australia	2.1 SOGS 5+	***29.0-33.0***	19.1	5.7	33.1 (incl. sports betting)	10.7	42.3	-	-	33.1 (incl. racing)	25.0
Gerstein *et al.* (1999)	US	0.5 DSM-IV 3+	***15.0***	-	-	-	-	-	-	-	-	-
Abbott and Volberg (2000)	New Zealand	0.9-1.8 SOGS-R 3+	***19.0***	-	-	-	-	-	-	-	-	-
Orford *et al.* (2013)	UK	2.5 PGSI 3+	**-**	9.5	11.9 (national) 4.5 (other)	25.2 (dogs) 12.9 (horses)	21.4 (online and in venue)	17.3 (slots) 34.8 (FBOT) 23.3 (online)	-	8.5	20.3 14.8 (football pools)	20.1 (non-sport event) 25.6 (poker) 12.1 (private)
Williams *et al.* (2013)	South Korea	n/a PGSI 5+	***31.1***	-	-	-	-	-	-	-	-	-
Australian state prevalence surveys												
ACIL Allen Consulting (2014)	Tasmania 2014	2.4 PGSI 3+	***20.5***	6.3	4.8	19.7	-	36.0	-	-	-	16.5 (keno) 21.3 (informal private games)
The Allen Consulting Group *et al.* (2011)	Tasmania 2011	2.4 PGSI 3+	***23.3***	10.0	5.2	23.9	35.2	47.7	-	26.1 (PGSI 1+)	26.3	26.8 (keno)
Young *et al.* (2006)	Northern Territory 2005	1.1 SOGS 5+	***29.0***	9.0	2.0	24.0	34.0	43.0	-	33.0	1.0	17.0 (keno) 69.0 (cards)

Table 2.1 (continued): Proportion of expenditure from individuals with gambling problems across types of gambling activity.

Study	Population	PG preval. + measure of PG %	All activities %	Scratchies %	Lotto/lottery %	Races %	Casino %	Slots/EGMs %	VLT %	Bingo %	Sports %	Other %
Other prevalence surveys												
Volberg (1993)	Washington 1993	5.1 SOGS 3+	***24.7***	-	24.2 (daily game)	25.9 (horses)	55.0 (cards/ dice)	-	23.9	44.6	18.9 (pools) 82.7 (bookies)	35.2
Volberg (1995)	Lousiana 1994	4.8 SOGS 3+	***41.2***	-	17.6	52.7 (horses on track) 84.9 (horses off track)	-	-	37.8	-	62.6	-
Gemini Research and Angus Reid Group (1994)	British Columbia 1994	3.9 SOGS 3+	***22.6***	14.3	11.9	29.5 (horses)	26.7 (resort) 33.1 (table)	-	-	37.3	21.7 (sports) 19.7 (friends) 15.2 (pools)	11.0-20.9
Wynne Resources Ltd (1994)	Alberta 1994	5.4 SOGS 3+	***32.3***		11.3 19.3 (instant)	54.2 (horses)	34.4 (table) 37.2 (local)	19.0	46.9	43.6	19.0 (friends/ co-workers)	10.0-45.1
Volberg *et al.* (1998)	Iowa 1995	3.3 SOGS 3+	***26.8***		24.4 (instant)	48.4 (horses)	38.4	16.1	-	-	43.9	-
Volberg *et al.* (2001)	Iowa 1995 (reanalysed)	3.3 SOGS 3+	**-**		19.3	43.1	33.3	15.3	-	-	-	9.0
Volberg *et al.* (2001)	Iowa, Mississippi, NY, Lousiana, Montana, Washington 1995-1998	2.3 – 4.9 SOGS 3+	**-**		14.9	18.7	27.0	25.7	-	25.1	-	-
Baseline Market Research Ltd (1996)	Nova Scotia 1996	5.5 SOGS 3+	***26.4***	22.7	6.2	-	48.7	8.9	50.8	-	-	-
Lesieur (1998)	New York 1996	3.6 SOGS 3+	***39.1***	-	21.9 36.0 (quick)	50.0	41.4	-	74.6	39.5	50.0	-
Volberg *et al.* (2001)	Mississippi 1996	4.9 SOGS 3+	**-**	-	15.1	8.0	13.1	18.5	-	-	-	23.1

Table 2.1 (continued): Proportion of expenditure from individuals with gambling problems across types of gambling activity.

Study	Population	PG preval. + measure of PG %	All activities %	Scratchies %	Lotto/lottery %	Races %	Casino %	Slots/EGMs %	VLT %	Bingo %	Sports %	Other %
Volberg *et al.* (2001)	Louisiana 1998	3.9 SOGS 3+	-	-	19.7	8.1	27.4	27.1 30.6 (casino slots)	-	11.7	-	-
Taylor *et al.* (1998)	Montana 1998	3.6 SOGS 3+	-	18.0	11.0	-	-	-	36.2	-	25.0	-
Volberg *et al.* (2001)	Washington State 1998	2.3 SOGS 3+	-	-	6.9	12.2	-	-	-	6.9	-	-
Williams and Wood (2004)	P.E.I 1999	3.1 SOGS 3+	***6.3***	-	-	-	-	-	-	-	-	-
Williams and Wood (2004)	Alberta 2001	5.2 PGSI 3+	***30.6***	-	-	-	-	-	-	-	-	-
Williams and Wood (2004)	Saskatchewan 2001	5.9 PGSI 3+	***25.2***	-	-	-	-	-	-	-	-	-
Williams and Wood (2004)	Manitoba 2001	3.4 PGSI 3+	***18.9***	-	-	-	-	-	-	-	-	-
Williams and Wood (2004)	Ontario 2001	3.8 PGSI 3+	***37.5***	-	-	-	-	-	-	-	-	-
Williams and Wood (2004)	New Brunswick 2001	3.2 PGSI 3+	***32.6***	-	-	-	-	-	-	-	-	-
Williams and Wood (2004)	British Columbia 2002	4.6 PGSI 3+	***26.2***	-	-	-	-	-	-	-	-	-
Williams and Volberg (2013)	Ontario 2010	1.4 PPGM3+	***24.1***	-	7.0	23.2 (horses)	56.9 (table)	31.2	-	23.7	33.2	50.5 18.6 (internet) 10.5 (social) 3.8 (raffle) 1.0 (stock market)

Table 2.1 shows that while the overall expenditure of problem gamblers is typically much greater than that of non-problem gamblers (up to 10 times), there is substantial variation across types of gambling and between jurisdictions. Although a number of previous Australian state and territory prevalence surveys have asked questions about gambling expenditure, only three studies to date have systematically reported the proportion of losses attributable to people with gambling problems across different activities. Two of these studies were conducted in Tasmania (ACIL Allen Consulting, 2014; The Allen Consulting Group *et al.*, 2011) and one in the Northern Territory (Young *et al.*, 2006). The most recent Tasmanian study reported that about a fifth (20.5%) of overall expenditure was derived from moderate risk and problem gambling groups combined (prevalence 2.4% of population) (ACIL Allen Consulting, 2014). In the Northern Territory prevalence study, the proportion of all expenditure from problem gamblers was nearly one third (29.0%) although the prevalence of problem gambling was measured using a different instrument (SOGS) and was substantially lower than that for Tasmania at just 1.1% of the population.

The discrepancies across activities and jurisdictions are striking, particularly when comparing gambling prevalence studies in the US. In 1995 in Iowa (Volberg *et al.*, 2001), for instance, the greatest problem gambling share was evident for betting on races (43.1%), with lower estimates for casino table games (33.3%), lottery (19.3%) and slot machines (15.3%). In the same survey, gamblers with problems accounted for comparatively little of expenditure on other activities, including raffles and pulltab (9%). In contrast, the problem gambling share was substantially lower (consistently below 20%) in Mississippi's 1996 gambling prevalence survey (Volberg *et al.*, 2001), except for bingo (23.1%).

Overall, previous reports show that people with gambling problems account for between 6.3% and 41.2% of total expenditure across activities. These estimates are disproportionately high considering the combined prevalence of problem and moderate risk gambling ranges from .5% to 5.5%. Despite many differences between studies, the PGES was largest for EGMs/slot machines followed by casino and sports betting.

2.3 Expenditure across socioeconomic and demographic groups

The utility of gambling expenditure data from general population surveys extends beyond the estimation of the problem gambling expenditure share. Research has also reported differences in typical expenditure across socioeconomic and demographic sub-groups of the population, covering expenditure on specific types of gambling and overall expenditure across activities. The Productivity Commission (1999) drew on information on income levels and expenditure in reporting that "gambling taxes are regressive" (Summary, Table 13). The report further elaborated that:

> *"The Commission's analysis suggests that taxes on lotteries and gaming machines are the main sources of this regressivity. The equity issues are heightened by the unevenness of the tax burden among the poorest households, with some paying much higher proportions of their income in gambling taxes than others."* (Productivity Commission, 1999; Summary p54)

To some degree, the socioeconomic and demographic differentials in gambling expenditure will reflect the uneven distribution of problem gambling across the population. It is known that men, younger people, people without partners, and people with lower levels of education have significantly higher rates of problem gambling than other groups in society (Desai *et al.*, 2004; Morasco and Petry, 2006; Pietrzak *et al.*, 2007; Productivity Commission, 1999). Consequently, we would expect these groups to report higher levels of gambling

expenditure, especially when expenditure is on activities with high rates of problem gambling, including EGMs and wagering.

Internationally, a number of general population surveys have investigated factors associated with levels of self-reported expenditure. While some have concentrated on overall expenditure across all forms of gambling, the majority of these studies have focussed on individual forms of gambling (although some include more than one form within a publication).

Overall expenditure across all forms of gambling

A survey of gambling in Texas conducted in 1995 (Wallisch, 1996) similarly found that men spent more on gambling than women, and young people (under 25 years) spent more than older age groups. There was also a strong increase in gambling expenditure across increasing levels of personal income. However the trend for education was less clear, with both low education and high education groups reporting more spending than those in between. However, there was no difference in spending across ethnic groups (Anglo, African American and Hispanic).

MacDonald *et al.* (2004) used the Statistics Canada 1996 Family Expenditure (FAMEX) Survey to examine household expenditure on games of chance for the whole of Canada and separately for the provinces of Nova Scotia and Saskatchewan. The amount of money spent per household was positively associated with age and household income and, yet, expenditure was significantly lower amongst respondents with higher levels of education. Other factors related to higher spending were greater age of respondent and the number of adults in the household (which, obviously, means there is more chance of contributing to the household's gambling expenditure). Lower expenditure was also evident amongst households with dependent children compared to those without dependent children.

A follow up of participants from a Queensland longitudinal study (the Mater-University of Queensland Study of Pregnancy) measured gambling expenditure at age 21 (data collected from 2002 to 2004). This study found higher expenditure amongst young men than young women, and marginally lower expenditure amongst those who were married or in de facto relationships compared with single people. Higher levels of expenditure were found for those who were in paid work and those with higher incomes compared to the unemployed and lower income participants respectively. Similar to the Canadian study, lower levels of expenditure were evident amongst respondents with higher levels of education with high spending being much less frequent in those with university education compared with those who did not complete high school.

The 2013 Tasmanian Gambling Prevalence Survey (ACIL Allen Consulting, 2014) found higher expenditure for men compared with women, and those aged 55 to 64 compared to other age groups, lower expenditure for those living as a couple with children at home, single parents, part time workers, those with personal incomes less than $25k per year as well as students and those who primarily had household duties. The standard errors for estimates were fairly broad and so several findings were uncertain. The lack of statistical power may have been the reason for the absence of clear-cut associations with income or education.

Expenditure on individual forms of gambling

The 1993-94 Australian Household Expenditure Survey (HES) was used by Worthington (2001) to explore socioeconomic and demographic differences in expenditure in a representative population sample restricted to New South Wales. The most consistent finding was that higher expenditure was related to higher income. This was the case for expenditure on lotteries, Lotto/scratch tickets, poker machines and casino games, but it was

not so for expenditure on TAB on-course betting or a residual category of "other gambling". In addition to (and adjusting for) income level, several types of welfare benefit receipt were linked to higher expenditure, including "age, disability and veterans' affairs benefits" for lotteries, Lotto and poker machines, unemployment allowance for Lotto expenditure and sole parent benefit for poker machine expenditure. Poker machine expenditure was also higher in multiple family households as well as single-parent households. It should be noted that Worthington (2001), when reporting significant correlates of expenditure, used $p<.10$ as the level of statistical significance, rather than the conventional level of $p< .05$. The increased likelihood of false positive findings should be kept in mind when interpreting the findings. Although income showed positive associations with expenditure in dollars, the pattern was nevertheless regressive in that the proportion of income expended was greater at lower levels of household income (Worthington, 2001).

More recently, Worthington *et al.* (2007) analysed expenditure in HES data for the whole of Australia (6892 households) in 1998-99. This paper focussed on the four most common types of gambling activity: (1) lottery tickets; (2) Lotto type games and instant lottery; (3) TAB on-course betting; and (4) poker machines. Unlike the earlier analyses, household income was not significantly associated with gambling expenditure for any activity. Aside of state/territory of residence, the following factors were related to gambling expenditure:

Lottery: single-person households, and households headed by a person between 30 and 69 years of age spent more on lottery.

Lotto/scratch tickets: households headed by a person over 30 years of age, those with more household members, those with retirees, those without dependents, main income source from salary/wage, and higher socioeconomic area of residence spent more on lotto/scratch tickets.

TAB on-course: sole-adult households; households headed by a person over 50 years, Australian born, male; not having dependents in household, having retirees in household, and higher socioeconomic area of residence spent more on on-course betting.

Poker machines: households with more household members; not having dependents in household; households headed by a person not self-employed, not being on age, disability, unemployment etc. pensions; higher socio-economic area of residence spent more on poker machines.

Welte *et al.* (2002) reported findings on expenditure from a U.S. national CATI survey of gambling conducted in 1999-2000 which covered involvement in: charity/bingo; games/sports; casino/track, and lottery/Keno. It is important to note that mean expenditure from specialist gambling surveys is typically estimated only for those who reported the particular activities in the past year and therefore excludes those who had zero expenditure (unlike family expenditure surveys which typically include those spending zero when estimating means). It is possible, therefore, that a group can have a very high average but contribute a low proportion of money spent because so few people in that group engaged in that particular activity. In the U.S. national survey, men spent more than women on average across activities other than lottery/Keno. Black Americans spent significantly more on average than white Americans on games/sports, casino/track and on lottery/Keno (although they were less likely to engage in these forms of betting). There were significant differences in losses between regions (not surprisingly given variation in availability of products) but not for age groups or quintiles of socioeconomic status.

In Australia, the most detailed study across several forms of gambling is the 2013 Tasmanian Gambling Prevalence Survey (ACIL Allen Consulting, 2014). Unfortunately, many of the analyses reported for socioeconomic and demographic differences in expenditure have low to modest statistical power and the reported findings are therefore difficult to evaluate and interpret.

Men spent significantly more money than women on Keno, casino table games, and sporting events but differences were not significant for EGMs, lotteries or scratch ticket expenditure. Too few women reported betting on horses and greyhound races or on informal private games to estimate their average expenditure and too few men played bingo to estimate their expenditure, reflecting obvious sex differences in spending. Younger people (especially those aged 18-24 years) spent lower amounts than older people on EGMs, horse and greyhound racing, lotteries and casino table games. However, the trend was reversed for betting on sports and other events and for informal private games (which were specific to 18-34 year men). The 35-44 age group reported either low spending or none at all for several forms of gambling including horse and greyhound racing, scratch tickets, lotteries, Keno, and sports and other events. Household structure did not show consistent relationships with expenditure and the most evident features of occupational status were the low spending of students and those who had primarily household duties. Being born in Australia rather than other countries was associated with higher spending on EGMs, horse and greyhound racing, bingo, sports and other events, and informal private games. Findings for income level and education did not show a consistent pattern and this is partly a reflection of differences in propensity to engage in various activities. For example, comparatively few people in higher income bands or with higher levels of qualifications played EGMs, Keno or bingo, bet on sports or other events, or purchased scratch tickets and so their average expenditure could not be estimated accurately. Average expenditure on scratch tickets and casino table games was still low, nevertheless, for the minority that reported these activities in the higher income and education groups.

Several studies have focussed on lottery expenditure. Adbdel-Ghany and Sharpe (2001) presented findings from the 1996 Canadian Family Expenditure Survey of over 10,000 households across Canada's six regional areas. For each region separately, household income, household wealth, age of household respondent (i.e. the "reference person"), urban location, education of respondent, country of birth, occupation, type of household and presence of children were used to predict dollar expenditure per annum on lotteries by participants (just under 80% of households had lottery expenditure). Overall, lottery expenditure was positively associated with income but showed little relationship with wealth. Older respondents reported higher household spending than younger respondents, and lone-person households spent less than multi-person households. Canadian–born respondents spent more than immigrants in several regions. Whilst household income was positively related to expenditure, occupation of participants was not associated with level of expenditure and education showed a consistent and significant negative association, i.e. higher qualifications were associated with lower lottery expenditure. Other lottery studies have found a similar pattern where greater expenditure is associated with higher income but also with lower education, including the UK National Lottery using Family Expenditure Survey data for 2000-01 (Forrest and Gulley, 2009) and the Spanish National Lottery (Perez and Humphreys, 2011). The Spanish study also found higher expenditure for men compared with women, for older compared with younger people, and for those in relationships compared with single people.

2.4 Summary and significance of previous expenditure research

This section summarises and discusses the implications of previous research on (1) expenditure by people with gambling problems and (2) expenditure by people in different socioeconomic and demographic groups. To date these areas of research have been investigated using different methodologies even though the underlying principles of these two topics are very similar. The ultimate value of both streams of work is similarly overlapping and so a key feature of the present report is to bring about a greater integration of these two areas of study.

Expenditure and problem gambling

Past studies of the proportion of gambling revenue derived from people with gambling problems have been consistent in showing that they contribute disproportionately to the total revenue across gambling products. Such findings are of no surprise given that loss of money and financial difficulties are an intrinsic part of the definition and identification of problem gambling. The main message to be taken from these estimates is that the disproportionate contribution is considerable. For total gambling revenue, people with gambling problems are, on average, spending 6 to 23 times more than gamblers who do not have problems. This occurs in a context where people with gambling problems have significantly lower education and also lower incomes than average. Therefore, as noted by the Productivity Commission (1999), gambling represents a regressive form of taxation.

The second generalisation that can be made from this research literature is that the proportion of revenue attributable to those with gambling problems varies substantially across different forms of gambling. It is much higher for EGMs, VLTs, casinos and races compared with national lottery, bingo, scratch tickets, and raffle, for example.

Expenditure across socioeconomic and demographic groups

The main motivation to examine the demographic associations of gambling expenditure is that a disproportionate amount of the revenue seems to come from the poor, vulnerable and disadvantaged. The expenditure on gambling does not fall evenly across different subgroups of the general population. This is so regardless of whether losses are viewed as a proportion of income (whether gross, net, individual or household) or expressed simply as dollars spent. Patterns emerge as to who spends more and who spends less on gambling and the strongest patterns seem to hold across different forms of gambling (although not necessarily of equivalent magnitude). The strongest relationships emerging are that men spend more than women on gambling, that older people spend more dollars than younger people, that people with higher incomes spend more than those on lower incomes, and that people with less education spend more than people with more education. Other factors are not so easily identified. For example, the findings in relation to household composition are complicated by the way in which household expenditure surveys aggregate the spending across adults. Thus single people may spend less than people who are part of a couple but if the spending of both people in a couple is added together then their household expenditure is likely to be more, on average, than single person households. Similar issues in interpretation apply to the way source of income (especially welfare benefits) is considered, where the type of benefit may be related to the nature of the household. This is most evident with sole-parent payments. These complexities are difficult to untangle unless studies were to collect data on individual expenditure in the context of multiple adult households. For now, we are limited to the predominant paradigms where specialist gambling prevalence surveys use the individual as the unit of analysis whereas family expenditure surveys are based on households.

Contrasting these two areas of research

The methodologies applied in the two fields reviewed are very different and there is a further division within the studies of socioeconomic and demographic differences in that research using family expenditure surveys utilises the whole population as the base whereas estimates derived from specialist gambling surveys are for expenditure just by those who engage in an activity in the past year (or just for gamblers where total expenditure is modelled). This was seen above for the U.S. national telephone gambling survey. The findings of household surveys are also different because they include expenditure by any adult in the household whereas specialist

gambling surveys typically inquire only of spending by individual respondents. All these factors have to be kept in mind in trying to summarise the results in a coherent way.

Focussing on methodologies, lessons can be taken from one area of study and applied in another. The most potentially useful example is that the approach to estimating the proportion of expenditure derived from problem gamblers could also be used to examine socioeconomic and demographic differences. To illustrate, it would be informative to know what proportion of total gambling losses was attributable to men and what proportion was attributable to women. Or, what proportion was derived from people with low education and those with higher qualifications. This approach can be extended to specific forms of gambling not just overall expenditure and, in this way, it would characterise different activities according to the population sub-groups that contributed most to the revenue for the particular forms of gambling. Volberg and Wray (2007) have drawn attention to the social and structural aspects of financial redistribution represented by gambling expenditure and highlighted particular groups in society, labelled as "the new gamblers" that show disproportionate representation in studies of gambling participation. Expenditure on gambling is a fundamental part of this picture and the estimation of spending by population sub-groups is an important and effective means of quantifying such disproportionate contributions. This report will contribute to this important but neglected area of research by estimating the shares of gambling expenditure derived from men and women, younger and older adults, those who are partnered and unpartnered, and those with higher and lower levels of education.

2.5 Comparisons of industry and self-report data

Many studies have directly compared the information about expenditure obtained from industry with survey data concluding that the figures rarely match. For instance, in both Australia and New Zealand, total expenditure estimated from self-reports was only 50-75% of industry revenue reported for tax purposes (Abbott and Volberg, 2000; Productivity Commission, 1999). Consistent underreporting of expenditure by gamblers in comparison to actual provincial gaming revenues was also found in Canada (Williams and Wood, 2004). Similarly, figures from the US show that total casino expenditure reported by gamblers summed up to total wins of $3 billion whereas the figures reported by the casinos were the equivalent of gamblers' losses of $20 billion (Gerstein *et al.*, 1999). The pattern between industry and self-reported expenditure was similar in relation to races and private gaming, lotteries being the only activity where gamblers reported figures matching the industry data (Gerstein *et al.*, 1999). Similarly, Volberg *et al.* (2001) showed significant underreporting across almost all activities and the only activity where industry data and self-reported averages showed a reasonable match was lottery. Other studies have found that self-report surveys can yield both lower and higher estimates of expenditure depending on the activity. For instance, in the previous ACT Prevalence Survey (2001) expenditure on table games at a casino and EGMs were respectively underreported by 60.9% and 60.0%, but lotteries and scratch tickets were respectively over-reported by 29.5% and 69.7% compared to industry data. The main conclusions of the aforementioned studies are that (1) self-reported gambling expenditure is inaccurate, (2) the accuracy of self-reported expenditure is an issue across most activities, but (3) lottery provides the best match between industry and self-reported figures.

It is important to note that several possible methodological problems might help account for the potential inaccuracy of gambling expenditure estimates, including sampling bias and the reliability and validity of the expenditure questions used (Volberg *et al.*, 1998). To increase the accuracy of expenditure estimates, Volberg and colleagues (2001) recommend that studies with small samples oversample heavy gamblers so that confidence intervals are narrowed and should inspect the distribution of wins and losses for each activity. They also noted that the reliability and validity of questions need to be investigated so that the most accurate measures (or those providing estimates closest to industry averages) can be identified. Studies have found a

wide variation in how participants interpret expenditure questions (Blaszczynski *et al.*, 1997) and even slight variations in wording can produce significant differences in reports (Wood and Williams, 2007).

Most Australian state and territory surveys include statements declaring that self-report data do not reflect industry data and cite reliability and validity problems for items assessing expenditure. Some States have responded by removing all questions about expenditure (e.g. Victoria) or reducing the information collected. The most recent NSW Prevalence Survey (Ogilvy Illumination, 2012) states:

> *"Collecting information on gambling expenditure is fraught with well-documented problems and data anomalies, inconsistent interpretations of the term 'spend' and cognitive biases preventing people from recalling/admitting real losses. Therefore, we made the decision (in keeping with 2006) not to ask detailed questions about gambling spend (for further discussion of this issue, see Wardle et al, 2007). We did, however, include a broader question on overall usual monthly spend on all gambling activities. While not necessarily an accurate expenditure figure per se, it does allow us to analyse the association between this variable and other factors such as income and problem gambling classification" (p18).*

Other states acknowledge some advantages of self-report data but present findings with strong caveats. For instance, the Tasmanian Prevalence Survey (The Allen Consulting Group *et al.*, 2011) included questions on gambling expenditure but qualified their interpretation.

> *"It should be noted that a gambler's self-reported gambling expenditure is typically under-reported compared to government data ... Research that has attempted to evaluate the validity of survey estimates of gambling expenditure has found respondents use a variety of measures. Moreover respondents often answer idiosyncratically and despite instructions explicitly stating the use of one particular approach (Blaszczynski et al, 2006). Therefore we advise caution when reporting or basing subsequent calculation using these figures" (p95).*

Overall, the purposes, advantages and disadvantages of industry and self-report data differ and there are a number of methodological reasons why estimates obtained from different sources may not be the same. Instead of discarding or discrediting one source in comparison to another, it may be more prudent to make best use of the particular advantages of both sources. There are rare but important examples where industry and self-report data have been combined. For instance, the Productivity Commission enquiries into gambling (1999, 2010) applied estimates of problem gambling expenditure share for specific activities[2] derived from survey data to the industry reports of expenditure in order to estimate overall losses across all problem gamblers. This approach compensates for under- or over-reporting of gambling expenditure in the survey data. In the 1999 report, the compensation for "expenditure biases" was applied using 1997-98 industry figures as the base. People with gambling problems were estimated to have lost $3,560 million in 1997-98 out of the total commercial industry revenue of $10,771 million for that year (Productivity Commission, 1999: Table P.6). This adjustment increased the PGES estimate for total expenditure across all activities from 29% based on survey self-reports alone to 33%, with the major part of this adjustment being due to compensation for the underreporting of EGM expenditure.

2. An amount was deducted from reported industry figures to represent gambling expenditure in Australia by non-residents, notably expenditure in casinos by "foreigners".

2.6 The project aims

There are two overarching aims for this study. The first involves estimating net expenditure shares for different subgroups in the population using the 2009 ACT Prevalence Survey. The second involves comparing the self-reported 2009 Survey data with AGS industry expenditure figures for the approximate same period of time, i.e. 2009-10.

The specific aims for this project are as follows.

1. To disaggregate net expenditure (i.e. losses) across:
    - level of problem gambling;
    - type of activity; and
    - socioeconomic and demographic subgroups.
    - Across subgroups we will report aggregate expenditure representative of the ACT population as well as average and proportional expenditure.
2. To compare the 2009 ACT Survey and AGS industry data on specific activities and across all activities for the ACT population:
    - Exploring whether prevalence survey can be compensated to match industry data; and
    - Evaluating the impact of such compensation.

The methods and results for each of the two broad aims are addressed in separate sections of this report.

Chapter 3: Methods of the 2009 ACT Prevalence Survey

This chapter describes the methods of the 2009 ACT Prevalence Survey of 5,500 ACT residents. Findings on gambling participation and problems in the Territory were reported in detail in a final report (Davidson and Rodgers, 2010).

3.0 Procedure

The procedures for the 2009 ACT Prevalence Survey were broadly based on gambling prevalence surveys undertaken by the Productivity Commission in 1999 (Productivity Commission, 1999) and in the ACT in 2001 (The ACT Gambling and Racing Commission, 2001). All data were collected using Computer Assisted Telephone Interviewing (CATI) by an accredited market and social research company. Data collection commenced on the 8th October and was completed on the 28th November, and interviews were conducted on weekdays (excluding Mondays and public holidays) and weekends.

3.1 Sample selection

Random digit dialling was used to contact 5,500 ACT residents. Random digit dialling involves the ongoing generation of telephone numbers, and attempts to call randomly selected numbers. The range of numbers dialled incorporated all landline numbers in the ACT, including listed and unlisted numbers.

The sampling method was designed to compensate for non-response amongst young adults, particularly males. Upon establishing contact with a household, the interviewers asked to speak to 'the youngest adult male, aged 18 or over, who lives there'. It was evident in the first week of data collection that males were being oversampled and so the introductory script was amended so that males were no longer targeted.

If the appropriate person was not available, the interviewer determined an appropriate time to call back. Interviewers also made appointments to call back if it was not a convenient time to undertake the interview. However, 47% of interviews were completed upon first establishing contact with a household.

3.2 Survey design

All 5,500 people initially identified to do the interview were asked whether they had participated in a range of gambling activities in the last 12 months. They were then asked how often they had participated in each undertaken activity (if any), and could answer per week, month or year. This information was used to determine total gambling frequency across all activities, and across all activities except lottery and scratch tickets. A global net expenditure question was also asked of everyone.

Table 3.1: Criteria used to select the subsample undertaking the detailed interview.

SELECTION CRITERIA			SUBSAMPLE
Total gambling frequency, last 12 months	**Activities included in total frequency†**	**Total out of pocket expenditure (all activities)**	**Proportion selected for detailed interview**
52 or more	All except lottery and scratch tickets	Any	100%
1-51	All except lottery and scratch tickets	Less than $2,000	25%
1 or more	People who only buy scratch tickets or play lottery	Less than $2,000	25%
1 or more	All activities	$2,000 or more	100%
0	All activities	-	50%

†At least some lottery or scratch tickets were purchased for themselves.

A subsample was then selected to proceed to a more detailed interview. Probability of selection was determined by people's frequency of gambling and net expenditure as shown in Table 3.1. Table 3.1 shows that everyone who either (i) gambled 52 times a year across all activities except lottery or scratch tickets or (ii) had spent $2,000 or more in the last 12 months was selected to undertake the detailed interview. One in four people who reported gambling 1-51 times in the last 12 months (and who had spent less than $2,000 on all activities) and 50% of non-gamblers were randomly selected to proceed to the more detailed interview. The method of selecting the subsample was designed to oversample people who had lost large amounts on gambling, high frequency gamblers and non-gamblers. Oversampling ensured that these groups would be large enough to undertake analyses and maximised the probability that people with current gambling problems would complete the detailed interview.

3.3 The sample

Table 3.2 shows the number of people interviewed for each of the criteria used to identify the subsample who proceeded to complete the detailed interview. For instance, this table shows that 55 of the people initially interviewed had a total gambling frequency less than 52, but had spent $2,000 or more in the last 12 months. The proportion and number of people selected to undertake the detailed interview is also described in Table 3.2. Everyone in the above example was selected for the detailed interview.

Table 3.2: Sample size for each of the criteria used to select the subsample undertaking the detailed interview.

SELECTION CRITERIA			ACHIEVED SAMPLE		
Total gambling frequency, last 12 months	**Activities included in total frequency†**	**Total out of pocket expenditure (all activities)**	**Initial sample (n)**	**Subsample completing detailed interview (n)**	**Proportion selected for detailed interview**
52 or more	All except lottery and scratch tickets	Any	338	337	100%
1-51	All except lottery and scratch tickets	Less than $2,000	2098	470	25%
1 or more	People who only do scratch tickets or lottery	Less than $2,000	1263	354	25%
1 or more	All activities	$2,000 or more	55	55	100%
0	All activities	-	1746	873	50%
Total			*5500*	*2089*	

†At least some lottery or scratch tickets were purchased for themselves.

There was a good spread of ages amongst the achieved sample, but when compared with the adult population of the ACT, those under 35 years of age were underrepresented, with a corresponding over representation of older people (see Davidson and Rodgers (2010) for more details). The respondent numbers in each of the age and gender cells provided the basis for weighting the sample in order to provide estimates that reflect the age and sex distribution of the ACT population.

3.4 The questionnaire

A summary of the types of measures of relevance to this report, and the people who received them, is given in Table 3.3. In brief, everyone selected to do the detailed interview was asked about their net expenditure on gambling, and also asked the socioeconomic and demographic questions. Furthermore, problem gambling was assessed among everyone who had gambled at least 12 or more times in the last 12 months (on activities other than lottery or scratch tickets), or who reported spending $2,000 or more (on any activity). The full questionnaire is available on the ACT Gambling and Racing Commission web site[3].

Two pilot tests were conducted, covering a total of 130 interviews. These interviews tested the CATI technical procedure and questionnaire. The research team were interviewed during the pilot and, through role play, deliberately structured their responses to ensure uncommon pathways through the questionnaire were tested.

Table 3.3: Summary of questionnaire items.

Measures	Sample[†]	People assessed
Gambling frequency, for each activity in the last 12 months	Full	All
Global net expenditure screen, across all activities in last 12 months	Full	All
Questions about specific activities (eg net expenditure and duration of gambling sessions) in the last 12 months	Subsample	If undertook activity in last 12 months
Problem gambling in the last 12 months (Problem Gambling Severity Index)	Subsample	If gambled 12 or more times in the last 12 months across all activities other than lottery or scratch tickets If reported losing $2,000 or more in the last 12 months on the global net expenditure item or net expenditure summed across all activities
Socioeconomic and demographic	Subsample	All

[†]Full sample=All 5,500 people initially contacted by interviewers; Subsample=those selected to proceed to the detailed interview.

3. http://www.gamblingandracing.act.gov.au/community/research

Measuring gambling expenditure

Everyone who proceeded to the detailed interview was asked about their net expenditure on each gambling activity they reported having undertaken in the last 12 months. The format of the question was the same for all activities. First, participants were reminded that they had indicated having undertaken that activity and how often they had done so. For instance, for EGMs 'You mentioned earlier that you played poker and gaming machines about' INSERT [frequency of play and 'times per (a) week, (b) month or (c) year']. A tailored item was used to measure expenditure for each activity; 'Subtracting any winnings, how much money did you spend on poker and gaming machines in' INSERT ['an average (a) week, (b) month or (c) in the last 12 months']. For some activities, such as racing, expenditure was assessed for a range of different gambling venues and methods. If people could not say, they were given a probe 'Can you give me an approximate amount?' Interviewers were also instructed to use the phrase 'Would you say you were out of pocket……' if people queried the question. When participants reported having won, interviewers were instructed to record the amount won as a negative number. A more detailed breakdown of the items assessing expenditure on individual activities is provided in Chapter 6.

Measurement and definition of problem gambling

The main measure of problem gambling used in the 2009 ACT Prevalence Survey was the Problem Gambling Severity Index (PGSI) from the Canadian Problem Gambling Index (CPGI: Ferris and Wynne, 2001). Everyone who reported gambling at least once a month across activities other than scratch tickets or lottery tickets, or who had spent $2,000 or more across all activities in the last 12 months was asked all of the questions in the PGSI (n=494).

The PGSI (see Box 3.1) comprises nine items asking how often gamblers experience a range of problems from their gambling, including betting more than they can afford, needing to gamble with larger amounts to get the same feeling of excitement, trying to win back the money they have lost and having financial problems. Response options range from 0 ('never') to 4 ('almost always'). People's responses to the nine items are summed, creating the PGSI total score (range 0-27). The PGSI total score reflects the continuum of increasing symptom severity underlying problem gambling. The total score is traditionally grouped into bands that define 'non-problem gambling' (0 score), 'low risk gambling' (1-2), 'moderate risk gambling' (3-7), and 'problem gambling' (8+).

The original definition of low risk gambling was having 'a low level of problems with few or no identified negative consequences'. However, recent research has found that low risk gamblers are distinctly different to non-problem gamblers and are more like moderate risk gamblers across a wide range of measures. Compared to non-problem gamblers, the low risk and moderate risk groups both have higher levels of gambling expenditure, gambling frequency, stress, and mental health and substance use disorders (Currie *et al.*, 2013). Moderate risk and low risk gamblers were similar in terms of their types of gambling activity and socioeconomic and demographic characteristics, and both were significantly different from non-problem gamblers. For this reason, PGES were also estimated in the present study for people reporting 'any symptom' (1+), reflecting the expenditure derived from people who report that they experience at least one of the nine PGSI symptoms (see Box 3.1).

Only a small number of people were classified as meeting the criteria for problem gambling (n=17). Consequently, at times, moderate risk and problem gambling were combined reflecting a 'moderate risk/ problem gambling' (3+) group.

Box 3.1: Problem Gambling Severity Index

In the past 12 months…

…have you bet more than you could really afford to lose?

…have you needed to gamble with larger amounts of money to get the same feeling of excitement?

…when you gambled, did you go back another day to try to win back the money you lost?

…have you borrowed money or sold anything to get money to gamble?

…have you felt that you might have a problem with gambling?

…has gambling caused you any health problems, including stress or anxiety?

…have people criticized your betting or told you that you had a gambling problem, regardless of whether or not you thought it was true?

…has your gambling caused any financial problems for you or your household?

…have you felt guilty about the way you gamble or what happens when you gamble?

Would you say…

0 Never. 1 Sometimes. 2 Most of the time. 3 Almost always.

TOTAL SCORE

Score of 0 = Non-problem gambling.
Score of 1 or 2 = Low level of problems with few or no identified negative consequences.
Score of 3 to 7 = Moderate level of problems leadings to some negative consequences.
Score of 8 or more = Problem gambling with negative consequences and a possible loss of control.

Source: Ferris and Wynne (2001).

Socioeconomic and demographic measures

This report includes analysis of four socioeconomic and demographic measures: (i) sex; (ii) age; (iii) marital status; and (iv) highest completed qualification. Participants were asked, 'What is your current marital status?' We report net gambling expenditure amongst people who were currently married or in a de facto relationship and those who were not (including those who were separated, divorced, widowed or never married).

Participants were also asked 'What is the highest level of education you have completed and a wide range of responses was possible (see Davidson & Rodgers, 2010). Qualifications were combined and net gambling expenditure is reported for four groups, those with (1) less than Year 12, (2) Year 12, (3) a trade certificate or diploma, and (4) a bachelor degree or higher.

3.5 Ethics approval

The Australian National University human research ethics committee approved the *2009 Survey on Gambling, Health and Wellbeing* (protocol 2009/410).

3.6 Statistical analysis

A two-stage approach to the analysis was used. First, we estimated net expenditure shares across levels of problem gambling, for all activities combined and for each type of activity (Chapter 4). Second, we estimated net expenditure shares across socioeconomic and demographic characteristics, for all activities combined and for specific activities (Chapter 5). Separate analyses are reported for the more common gambling activities (lottery, EGMs, horse and greyhound races, scratch tickets, table games at a casino, and sports and special events). The number of adults gambling on each of keno, bingo, private games like cards, and casino-type games on the internet was too small to enable separate analyses for these activities.

In total, 2,089 adults completed the detailed interview. Amongst these individuals 2,074 had complete data on gambling frequency. Further to this, missing data on the individual socioeconomic and demographic measures used in this report were minimal (see Table 10.1 in the Appendix for a comprehensive list). In total 2,053 people had complete data across all socioeconomic and demographic measures. Missing data were also minimal on individual gambling measures (e.g. only one person had missing data on the PGSI). However, missing data on overall net expenditure were more substantial (n=44). The sample for all analyses comprised 2,008 individuals with complete information on all measures used in this report. Mean (reflecting per capita), total ACT population and proportional net expenditure are reported across PGSI and socioeconomic and demographic measures, summed across all activities and separately for each type of activity.

Two parallel analyses of the 2009 ACT Survey were conducted. The first utilised raw data as reported by participants and is included in the main body of this report. However, the impact of extreme and potentially unreliable answers (i.e. outliers) regarding losses or wins from gambling was also explored. All analyses were re-run using a *Winsorised* technique where extreme answers are capped. For this report all net expenditure measures (where feasible) were capped at the top and bottom 1% for the parallel analyses.

For some activities, the 1% threshold did not capture any responses and, therefore, net expenditure measures could not be capped. This was particularly an issue when very few people participated in an activity. Net expenditure could not be capped for (i) betting on sports and special events in person, by phone and using the internet (ii) betting on races by phone and internet, (iii) bingo, and (iv) casino-type games on the internet. An alternative (capped) overall net expenditure measure was then calculated by summing across the net expenditure measures for individual activities after these had been capped. The capped analyses are presented in the Appendix (sections 10.1 through 10.6).

Confidence intervals for expenditure shares were estimated using a non-parametric bootstrap with ordinary sampling and the percentile method of estimating confidence intervals (Davison and Hinkley, 1997). Five thousand bootstrap replications were used when estimating confidence intervals. Bootstrap methods were selected because the extremely right-skewed distribution of the expenditure data violated the assumptions required for standard Wald-style confidence intervals. *P*-values were approximated by direct calculation from bootstrap estimates and by bootstrapping the *F*-statistic. Twenty-five thousand bootstrap replications were used when estimating *p*-values. When estimating *p*-values, non-gamblers were excluded from problem gambling expenditure share analyses, but they were included in socioeconomic and demographic expenditure share analyses.

3.7 Weighting the 2009 ACT Survey

In order to generalise findings from the sample to the ACT adult population it was important to ensure that the survey sample represented the ACT population as much as possible. Therefore potential sources of sample bias needed to be identified and addressed. First, only one adult had been selected for interview from each household, so the number of adults *not interviewed* in each household needed to be taken into account. Second, the oversampling of non-gamblers, high frequency gamblers and people losing large amounts on gambling needed to be taken into account in all analyses using the subsample who completed the detailed interview. Third, people who answered the 'phone and agreed to do the survey might have differed from those who did not. Simple statistical weights were derived and used to compensate for the under- or over-representation of particular people (or characteristics) in the sample. All analyses for this report were weighted (defined below).

Weight 1: The population weight

Everyone who agreed to complete the interview was asked the number of adults aged 18 or over who normally live in their household. This information was used to compensate for the probability of an individual being selected in the household. The population weight also addressed the oversampling of non-gamblers, high frequency gamblers and people losing large amounts on gambling (detailed in Table 3.1), so that levels of gambling were proportionately represented. The weight also ensured that the sample proportionately reflected registered marital status, age, and sex of the ACT adult population. Finally, the weight was rescaled so that the ACT Survey participants reflected the number of adults in the ACT at that time (as discussed above). This means that population estimates based on the survey data represent the ACT adult population at the time of the survey.

Weight 2: Compensating for potential bias arising from missing data

Missing data are an important source of potential bias. For instance, people who gamble more frequently or who have gambling problems may be less able (or less willing) than people who gamble less often or who do not have problems to answer questions about how much they lose gambling. Chi-square tests were used to explore the potential impact of missing data on the results (see Table 10.2 in the Appendix). Missing data on overall net expenditure were not related to any of the socioeconomic or demographic measures. That is, missing data on overall net expenditure were evenly distributed across socioeconomic and demographic measures, and therefore not likely to influence the results. In contrast, missing data on overall net expenditure were significantly related to level of problem gambling ($p=.001$) and frequency of gambling ($p<.001$). People with higher-level problem gambling and who gambled more frequently were more likely to have missing net expenditure data.

Therefore a failure to address missing data on overall net expenditure would result in underestimating net expenditure amongst higher levels of problem gambling.

Multiple logistic regression analysis was used to explore missing net expenditure data across overall gambling frequency and level of problem gambling (independent variables). Missing net expenditure data amongst the more frequent gamblers accounted for the statistical association between missing financial data and the PGSI, indicating that addressing missing data across frequency of gambling would also address missing data across the PGSI. A final single weight was therefore used to address missing data on net expenditure across frequency of gambling. Logistic regression was used to estimate the probability of having missing data on total net expenditure for each of the gambling frequency categories (non-gamblers could not have missing data and so their probability was determined to be 1). This probability was multiplied by the population weight (above) to derive a final weight that was used in all analyses. In summary, this final weight was used to ensure that the sample proportionately reflected the ACT adult population at the time of the survey and to compensate for potential bias arising from missing data.

Chapter 4: Problem gambling expenditure shares

The main aims for this chapter are to describe:

1. net expenditure by type of activity;
2. problem gambling expenditure shares across all activities combined; and
3. problem gambling expenditure shares for specific activities.

Finally, we compare problem gambling expenditure shares across different activities. Parallel analyses using capped (Winsorised) expenditure measures are presented in the Appendix (Tables 10.3 through 10.9).

4.0 Expenditure by type of activity in the ACT

Table 4.1 describes participation on gambling activities, mean net expenditure and total gambling losses for the ACT adult population. The second column shows the proportion of total net expenditure attributed to each type of activity. Lottery was the most commonly undertaken activity followed by EGMs, and horse and greyhound races. The most and, therefore, greatest proportion of money was lost on EGMs, followed by horse and greyhound races and then lottery.

This table also shows an estimate of the total amount of money lost gambling amongst ACT adults ($136m) based on self-report.

Table 4.1: Net expenditure (in dollars) by type of activity in the ACT.

Activity	Participation†	Proportion of total losses (95% CIs)	Mean losses	ACT population losses
Lottery	46.1%	23.7% (19.6-29.2%)	$118	$32,328,187
EGMs	30.2%	34.6% (28.6-41.9%)	$172	$47,175,447
Horse and greyhound races	24.5%	23.7% (14.9-31.5%)	$118	$32,335,704
Scratch tickets	22.8%	2.9% (2.3-3.6%)	$14	$3,906,322
Table games at a casino	8.3%	4.8% (2.7-7.4%)	$24	$6,519,370
Sports and special events	7.9%	6.8% (3.9-10.1%)	$34	$9,252,952
Keno	5.8%	2.1% (1.2-3.3%)	$11	$2,894,973
Other activities*	10.8%	1.3% (-6.6-6.5%)	$7	$1,807,248
Sum across activities	69.8%	-	$497	$136,220,203

†Source: The 2009 ACT Survey (Davidson & Rodgers, 2010, p19).
*Other activities include bingo, private games like cards for money, casino type games on the internet and two-up.

4.1 Problem gambling expenditure shares across all activities

Table 4.2 shows the problem gambling expenditure share (PGES) for all activities combined. The first and second columns show the number and proportion of people for each level of problem gambling in the ACT adult population. The third column shows the proportion of gamblers for each level of problem gambling. The fourth column shows the proportion of net expenditure attributable to each PGSI category along with their 95% confidence intervals. The fifth column shows estimates of the mean expenditure for each of the PGSI categories along with the statistical significance of differences between the mean for non-problem gamblers and each of the means for other groups. The sixth column shows net expenditure for each of the PGSI categories estimated for the ACT population. Subsequent tables in this chapter follow the same format.

Non-problem gamblers lost the least money on average, but because they are the biggest group of gamblers (92.1%) they lost the most money in total (more than $61m). Overall, 44.9% of all money lost gambling came from non-problem gamblers. The majority of money lost came from people with at least some symptoms [PGSI 1+: 55.1%, (95% CI 45.2-68.5%)] and more than a quarter was accounted for by moderate risk/problem gamblers [PGSI 3+: 27.1%, (95% CI 20.8-36.3%)].

Table 4.2: Net expenditure (in dollars) on all activities in the last 12 months by level of problem gambling.

PGSI category	N ACT population	Proportion adult population	Proportion of gamblers	Expenditure shares (95% CIs)	Mean losses[a] (p-value[b])	ACT population losses
Non-gambler	88,894	32.4%	-	-	-	-
Non-problem	170,769	62.3%	92.1%	44.9% (36.8-54.7%)	$358[r]	$61,134,144
Low risk	9,338	3.4%	5.1%	28.0% (19.7-38.1%)	$4,078 (<.001)	$38,079,851
Moderate risk	3,664	1.3%	2.1%	17.3% (11.8-25.1%)	$6,441 (<.001)	$23,600,431
Problem	1,320	0.5%	0.7%	9.8% (7.0-14.7%)	$10,156 (<.001)	$13,405,777

a. Overall significance: differences between means across PGSI categories excluding non-gamblers (p<.001, df =3).
b. Significance of difference between the mean and the reference group mean.
r. Reference group mean.

The following tables show problem gambling expenditure shares for specific types of gambling activity, from the most to the least commonly undertaken activity.

4.2 Problem gambling expenditure shares for lottery

Table 4.3 shows expenditure on lottery by PGSI categories. Non-problem gamblers lost, on average, $167 on lotteries in the last 12 months. On average, low risk ($227) and moderate risk ($240) gamblers lost more than non-problem gamblers, but not as much as problem gamblers ($564). Table 4.3 shows that 88.4% of net expenditure on lottery came from non-problem gamblers who represent 92.1% of all gamblers. Summing across the other PGSI groups, 11.6% (95% CI 8.8-14.8%) of money lost on lotteries came from people who had at least some problem gambling symptoms (PGSI 1+) and 5.0% (95% CI 2.8-7.4%) came from moderate risk/problem gamblers (PGSI 3+).

Table 4.3: Net expenditure (in dollars) on lottery in the last 12 months by level of problem gambling.

PGSI category	N ACT population	Proportion adult population	Proportion of gamblers	Expenditure shares (95% CIs)	Mean losses[a] (p-value[b])	ACT population losses
Non-gambler	88,894	32.4%	-	-	-	-
Non-problem	170,769	62.3%	92.1%	88.4% (81.4-96.2%)	$167[r]	$28,586,953
Low risk	9,338	3.4%	5.1%	6.6% (4.7-8.7%)	$227 (.163)	$2,117,562
Moderate risk	3,664	1.3%	2.1%	2.7% (1.4-4.3%)	$240 (.319)	$878,547
Problem	1,320	0.5%	0.7%	2.3% (0.7-4.5%)	$564 (.067)	$745,126

a. Overall significance: differences between means across PGSI categories excluding non-gamblers (p=.011, df =3).
b. Significance of difference between the mean and the reference group mean.
r. Reference group mean.

4.3 Problem gambling expenditure shares for EGMs

Table 4.4 shows that mean net expenditure on EGMs increased across levels of problem gambling, from non-problem (mean $78) to problem (mean $6,582). In total, moderate risk gamblers lost more money on EGMs (about $10.6m) than problem gamblers ($8.7m), largely because they represent a greater proportion of the adult population (1.3% vs 0.5% respectively). This table also shows that non-problem gamblers accounted for 28.2% of all money lost on EGMs. In contrast, 71.8% (95% CI 59.1-88.5%) of money lost came from people with at least some problem gambling symptoms (PGSI 1+) and 40.8% (95% CI 31.7-53.7%) came from moderate risk or problem gamblers (PGSI 3+).

Table 4.4: Net expenditure (in dollars) on EGMs in the last 12 months by level of problem gambling.

PGSI category	N ACT population	Proportion adult population	Proportion of gamblers	Expenditure shares (95% CIs)	Mean losses[a] (p-value[b])	ACT population losses
Non-gambler	88,894	32.4%	-	-	-	-
Non-problem	170,769	62.3%	92.1%	28.2% (22.2-36.1%)	$78[r]	$13,294,329
Low risk	9,338	3.4%	5.1%	31.0% (21.36-42.5%)	$1,565 (<.001)	$14,612,401
Moderate risk	3,664	1.3%	2.1%	22.4% (16.4-31.3%)	$2,888 (<.001)	$10,580,402
Problem	1,320	0.5%	0.7%	18.4% (13.5-26.0%)	$6,582 (<.001)	$8,688,315

a. Overall significance: differences between means across PGSI categories excluding non-gamblers (p<.001, df =3).
b. Significance of difference between the mean and the reference group mean.
r. Reference group mean.

The problem gambling expenditure share for EGMs mirrors that found in parallel analyses of the time spent playing EGMs during the last year, where 65.8% (95% CI 53.0-81.6%) of the time spent playing EGMs was accounted for by people with at least some problem gambling symptoms (PGSI 1+) and 36.8% (95% CI 27.3-49.5%) of time spent was accounted for by moderate risk or problem gamblers.

4.4 Problem gambling expenditure shares for horse and greyhound races

Table 4.5 shows net expenditure on horse and greyhound races. On average problem gamblers lost the most money (mean $1,828), however the most money in total came from low risk gamblers ($15.4m). This table also shows that 28.6% of money lost was accounted for by non-problem gamblers. People with at least some symptoms (PGSI 1+) accounted for a substantial proportion of net expenditure on horse or greyhound races [71.4% (95% CI 48.5-117.0%)]. Moderate risk/problem gamblers (PGSI 3+) accounted for almost a quarter of all losses [23.8% (95% CI 10.6-46.5%)].

Table 4.5: Net expenditure (in dollars) on horse or greyhound races in the last 12 months by level of problem gambling.

PGSI category	N ACT population	Proportion adult population	Proportion of gamblers	Expenditure shares (95% CIs)	Mean losses[a] (p-value[b])	ACT population losses
Non-gambler	88,894	32.4%	-	-	-	-
Non-problem	170,769	62.3%	92.1%	28.6% (13.1-50.4%)	$54[r]	$9,236,300
Low risk	9,338	3.4%	5.1%	47.6% (26.0-82.5%)	$1,650 (<.001)	$15,407,573
Moderate risk	3,664	1.3%	2.1%	16.3% (6.5-32.7%)	$1,441 (<.001)	$5,279,064
Problem	1,320	0.5%	0.7%	7.5% (0.3-20.5%)	$1,828 (.053)	$2,412,767

a. Overall significance: differences between means across PGSI categories excluding non-gamblers (p<.001, df=3).
b. Significance of difference between the mean and the reference group mean.
r. Reference group mean.

4.5 Problem gambling expenditure shares for scratch tickets

Table 4.6 shows net expenditure on scratch tickets in the last 12 months for each of the PGSI categories. Similar to lotteries, non-problem gamblers lost less on average on scratch tickets than other PGSI groups but because they represent a larger proportion of the ACT adult population, they accounted for the greatest amount and proportion of money lost (82.3%) on scratch tickets. In total 17.7% (95% CI 12.4-23.6%) of money lost on scratch tickets came from people who had at least some problem gambling symptoms (PGSI 1+) with 10.0% (95% CI 5.5-15.1%) coming from moderate risk/problem gamblers (PGSI 3+).

Table 4.6: Net expenditure (in dollars) on scratch tickets in the last 12 months by level of problem gambling.

PGSI category	N ACT population	Proportion adult population	Proportion of gamblers	Expenditure shares (95% CIs)	Mean losses[a] (p-value[b])	ACT population losses
Non-gambler	88,894	32.4%	-	-	-	-
Non-problem	170,769	62.3%	92.1%	82.3% (72.1-93.8%)	$19[r]	$3,215,074
Low risk	9,338	3.4%	5.1%	7.7% (4.9-10.9%)	$32 (.060)	$300,987
Moderate risk	3,664	1.3%	2.1%	6.5% (3.7-10.1%)	$69 (.002)	$254,632
Problem	1,320	0.5%	0.7%	3.5% (0.4-7.9%)	$103 (.155)	$135,629

a. Overall significance: differences between means across PGSI categories excluding non-gamblers (p=.001, df=3).
b. Significance of difference between the mean and the reference group mean.
r. Reference group mean.

4.6 Problem gambling expenditure shares for table games at a casino

Table 4.7 shows net expenditure on table games at a casino across levels of problem gambling. On average, moderate risk gamblers lost the most money gambling on table games at a casino (mean $342) and non-problem gamblers lost the least (mean $13). In total, the most money lost on table games at a casino came from low risk gamblers (almost $3.0m). People with at least some symptoms (PGSI 1+) accounted for two-thirds of all money lost on table games at a casino [65.9% (95% CI 41.2-105.1%)]. One fifth of money lost came from moderate risk/problem gamblers [PGSI 3+: 20.4% (95% CI 6.7-41.0%)].

Table 4.7: Net expenditure (in dollars) on table games at a casino in the last 12 months by level of problem gambling.

PGSI category	N ACT population	Proportion adult population	Proportion of gamblers	Expenditure shares (95% CIs)	Mean losses[a] (p-value[b])	ACT population losses
Non-gambler	88,894	32.4%	-	-	-	-
Non-problem	170,769	62.3%	92.1%	34.1% (13.0-61.5%)	$13[r]	$2,224,058
Low risk	9,338	3.4%	5.1%	45.5% (20.0-78.8%)	$318 (<.001)	$2,966,673
Moderate risk	3,664	1.3%	2.1%	19.2% (5.6-39.6%)	$342 (.001)	$1,252,772
Problem	1,320	0.5%	0.7%	1.2% (0.0-3.6%)	$57 (.735)	$75,867

a. Overall significance: differences between means across PGSI categories excluding non-gamblers (p<.001, df=3).
b. Significance of difference between the mean and the reference group mean.
r. Reference group mean.

4.7 Problem gambling expenditure shares for sports and special events

Table 4.8 shows net expenditure on sports or special events across PGSI categories. On average, problem gamblers lost the most money (mean $847) but, in total, non-problem gamblers accounted for the most money lost on sports or special events across the population ($3.9m). Non-problem gamblers accounted for 42.4% of money lost on sports or special events but represent 92.1% of all gamblers. Conversely, people with at least some symptoms (PGSI 1+) accounted for 57.6% (95% CI 32.8-92.9%) of expenditure but comprised just 7.9% of gamblers. Moderate risk/problem gamblers (PGSI 3+) accounted for 40.8% (95% CI 16.8-71.7%) of all money lost on sports or special events.

Table 4.8: Net expenditure (in dollars) on sports or special events in the last 12 months by level of problem gambling.

PGSI category	N ACT population	Proportion adult population	Proportion of gamblers	Expenditure shares (95% CIs)	Mean losses[a] (p-value[b])	ACT population losses
Non-gambler	88,894	32.4%	-	-	-	-
Non-problem	170,769	62.3%	92.1%	42.4% (20.8-72.5%)	$23[r]	$3,924,400
Low risk	9,338	3.4%	5.1%	16.8% (5.9-34.7%)	$167 (.010)	$1,556,202
Moderate risk	3,664	1.3%	2.1%	28.7% (3.2-56.3%)	$725 (.008)	$2,654,958
Problem	1,320	0.5%	0.7%	12.1% (0.0-31.2%)	$847 (.119)	$1,117,392

a. Overall significance: differences between means across PGSI categories excluding non-gamblers (p<.001, df=3).
b. Significance of difference between the mean and the reference group mean.
r. Reference group mean.

4.8 Comparing problem gambling expenditure shares across different types of activity

Figure 4.1 summarises the findings regarding problem gambling expenditure shares for each of the gambling activities, and then for net expenditure summed across all activities. This figure provides an easy means of comparing the profile of different activities. Essentially, the darker the column the higher the expenditure shares derived from people with problem gambling symptoms. The final column in this figure shows the distribution of problem gambling groups as a proportion of all gamblers in the ACT population. It is immediately apparent that the PGES is lower for lottery and for scratch tickets than for other activities although gamblers with some level of problem still contribute disproportionately to losses on these activities. For other activities, the proportionate contribution from those with gambling problems is substantially greater.

Comparing across activities, the greatest proportion of losses derived from people with problem gambling symptoms was seen for net expenditure on EGMs (71.8%; the darker areas of the column). By contrast, the least proportion of losses coming from people with symptoms was seen for lottery (11.6%). A considerable proportion of net expenditure on horse or greyhound racing (71.4%), table games at a casino (65.9%) and from betting on sports or special events (57.6%) came from people with problem gambling symptoms, whereas only 17.7% of losses on scratch tickets were from people with symptoms.

Focussing on the losses of moderate risk and problem gamblers combined (PGSI 3+; the threshold most commonly used in international studies) the largest problem gambling expenditure share was evident both for EGMs and for betting on sports and special events (40.8%). Other high values were seen for table games at a casino (20.4%) and horse and greyhound races (23.8%). The PGES estimate for overall gambling expenditure in the ACT based on the same threshold is 27.1%.

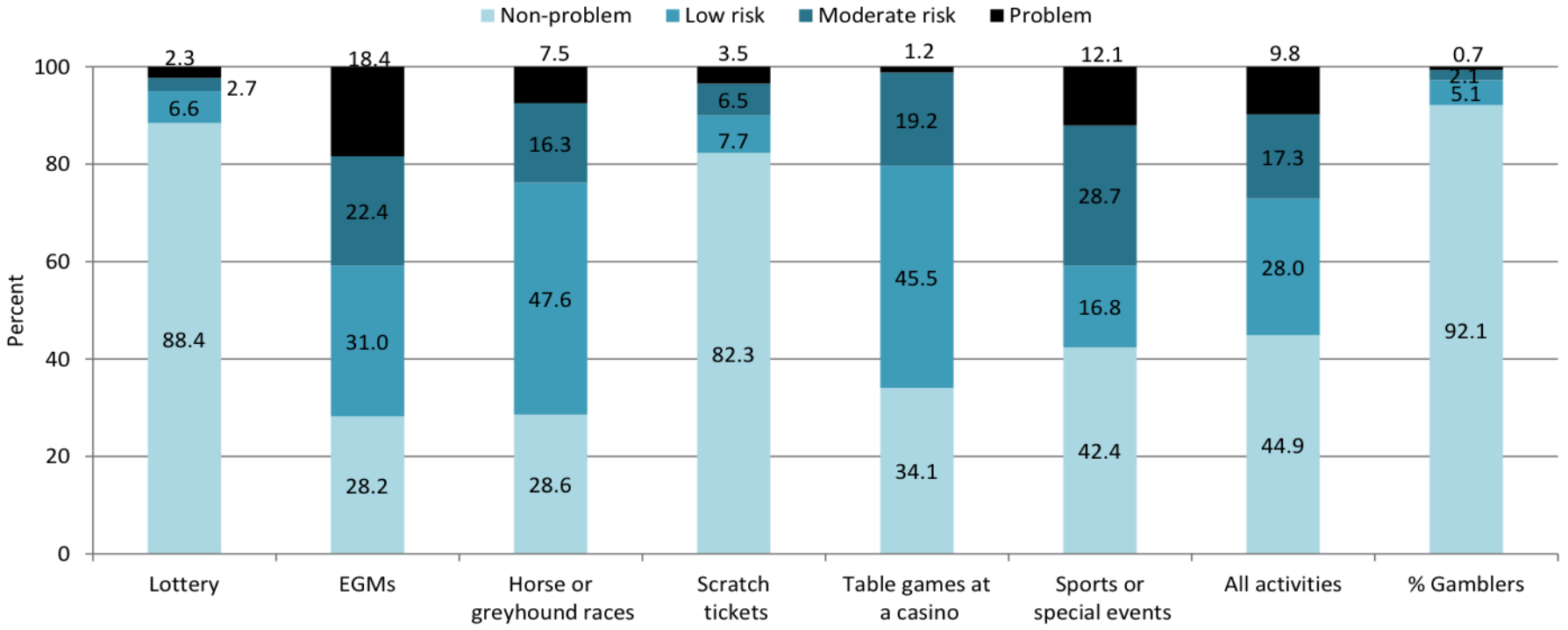

Figure 4.1: A summary of gambling expenditure shares (%) by level of problem gambling, type of activity and across all activities.

4.9 Comparing findings from the uncapped and capped analysis

The Appendix presents comparable findings for expenditure shares across PGSI categories using the Winsorised (capped) measures of expenditure. Tables 10.3 through 10.9 can be compared with Tables 4.1 to 4.7 in the present chapter. Note that there are no Winsorised analyses for net expenditure on sports and special events because the 1% threshold did not capture any responses and the measure could not be capped. Overall, the findings are consistent between uncapped and capped analyses with small differences in estimates of PGES.

Key Findings of Chapter 4

1. Based on self-report, total gambling losses for ACT residents in 2009 is estimated at around $136m. Self-reports are likely to underestimate actual losses.
2. The three activities that accounted for the large majority of total losses were betting on EGMs ($47m), lotteries ($32m), and horse and greyhound races ($32m).
3. Gamblers with problem gambling scores (Problem Gambling Severity Index) of three or more accounted for 27.1% of reported losses summed across all activities. When gamblers with any problems are included (PGSI score of one or more) 55.1% of all losses are attributable to this relatively small group (5.2% of the ACT population).
4. For some activities, the proportion of losses derived from gamblers with problems is less than for other activities. Just 5.0% of net lottery expenditure is from moderate risk/problem gambling individuals.
5. Playing EGMs is the activity where net expenditure is most concentrated in those with problem gambling symptoms. Over 70% of EGM losses (71.8%) are derived from people with PGSI scores of 1 or more even though they represent just 5.2% of the ACT adult population.
6. Other activities where a large share of expenditure comes from people with problem gambling symptoms are betting on sports and special events (57.6%), casino table games (65.9%), and horse and greyhound races (71.4%).
7. Using the threshold for problem gambling which is most common in the international literature (PGSI of 3 or more), the largest problem gambling expenditure shares were found for EGMs and sports betting (both 40.8%), horse and greyhound races (23.8%), and casino table games (20.4%). Lotteries and scratch tickets have much lower problem gambling expenditure shares; 5.0% and 10.0% respectively.

Chapter 5: Socioeconomic and demographic expenditure shares

The general aim of this chapter is to disaggregate net gambling expenditure in terms of socioeconomic and demographic characteristics. First, we describe overall gambling expenditure shares (using expenditure summed across all activities) for particular socioeconomic and demographic groups. Then we describe socioeconomic and demographic expenditure shares for the six main gambling activities analysed for this report. Finally, we contrast the estimates of specific socioeconomic and demographic expenditure shares across different activities.

The tables in this chapter show net expenditure by sex, age, marital status and highest completed qualification. The format of each table is the same as those presented in the previous chapter. Results of parallel analyses, using capped financial loss measures, can be found in the Appendix (Tables 10.10 through 10.15).

5.0 Socioeconomic and demographic expenditure shares for all activities

Table 5.1 details net expenditure summed across all activities. Beginning with the rows for women and men at the top of the table, the mean losses (third column) show that men, on average, spent significantly more on gambling than women ($746 in the last 12 months compared with $260). In keeping with this difference, the percentages in column 3 show that men accounted for almost three-quarters (73.3%) of the total amount spent across the ACT and women contributed 26.7%. A comparison with the percentages in column 2 (the proportions of the ACT adult population who are women and men), indicates that the expenditure share for men (73.3%) is greater than their representation in the ACT adult population and so they contribute disproportionately more to the total amount spent. Women (expenditure share of 26.7%), correspondingly, contribute disproportionately less to ACT losses on gambling.

For marital status, those living with a partner spent significantly less on average than those who did not have a partner ($405 and $644 respectively). The latter group contribute just as much to the population total spend (50.1%) even though they represent just 38.5% of the adult population.

There was a strong gradient in mean losses across different educational groups. People without Year 12 education or post-school qualifications spent more than four times the mean for those with degrees ($902 and $213). The former, consequently, contributed disproportionately more to the total ACT spend and the latter substantially less (expenditure shares in column 3).

There was no significant difference in mean losses across age groups and so their expenditure shares are similar to their representation in the ACT adult population.

Table 5.1: Net expenditure (in dollars) on all activities in the last 12 months by socioeconomic and demographic characteristics.

Measure	N ACT population	Proportion adult population	Expenditure shares (95% CIs)	Mean losses[a] (p-value[b])	ACT population losses
Sex					
Women	140,078	51.1%	26.7% (21.6-33.2%)	$260 (<.001)	$36,380,120
Men	133,907	48.9%	73.3% (63.0-84.1%)	$746[r]	$99,840,083
Age					
18-24	44,848	16.4%	12.7% (7.1-18.6%)	$387 (.334)	$17,336,231
25-44	96,349	35.2%	43.4% (34.0-53.3%)	$613 (.347)	$59,066,700
45-64	95,432	34.8%	35.2% (28.8-43.9%)	$503[r]	$47,982,012
65+	37,357	13.6%	8.7% (4.1-13.9%)	$317 (.156)	$11,835,261
Married or de facto					
No	105,570	38.5%	50.1% (41.4-60.4%)	$644 (.023)	$68,013,231
Yes	168,415	61.5%	49.9% (40.9-60.4%)	$405[r]	$68,206,972
Highest completed qualification					
< Year 12	28,364	10.4%	18.8% (13.9-24.4%)	$902 (<.001)	$25,590,908
Year 12	71,728	26.2%	39.4% (30.3-48.9%)	$748 (<.001)	$53,665,439
Trade certificate or diploma	50,152	18.3%	22.5% (17.2-28.8%)	$611 (<.001)	$30,625,113
Bachelor degree or higher	123,741	45.2%	19.3% (12.8-26.5%)	$213[r]	$26,338,743

a. Overall significance: differences between means across socioeconomic and demographic measures including non-gamblers (age p=.199, df=3; highest completed qualification p<.001, df=3).
b. Significance of difference between the mean and the reference group mean.
r. Reference group mean.

5.1 Socioeconomic and demographic expenditure shares for lottery

Table 5.2 shows net expenditure on lottery tickets for different socioeconomic and demographic groups. Significantly higher average losses are seen for men ($143) compared with women ($94), and their greater expenditure share (59.4%) is shown in column 3. Younger age groups (18-24 and 25-44) had lower average losses than the 45-64 group and their expenditure shares were consequently below their representation in the ACT population (2.4% and 28.8% compared with 16.4% and 35.2%, respectively). People who lived with a partner spent more on average on lottery tickets and had a correspondingly high expenditure share; the

opposite of the difference found for losses across all types of gambling activity combined (Table 5.1). Mean expenditure on lottery tickets was higher for those with lower levels of education. People without Year 12 education and no post-school qualifications spent more than double the amount spent by people with degrees. Those with degree-level qualifications therefore accounted for a disproportionately small share (31.1%) of net lottery expenditure, given that they represent 45.2% of the adult population. In contrast, those without Year 12 education and no post-school qualifications showed a greater expenditure share on lotteries (17.6%) relative to their prevalence in the population (10.4%).

Table 5.2: Net expenditure (in dollars) on lottery tickets in the last 12 months by socioeconomic and demographic characteristics.

Measure	N ACT population	Proportion adult population	Expenditure shares (95% CIs)	Mean losses[a] (p-value[b])	ACT population losses
Sex					
Women	140,078	51.1%	40.6% (35.3-46.2%)	$94 (<.001)	$13,122,792
Men	133,907	48.9%	59.4% (53.3-66.0%)	$143[r]	$19,205,395
Age					
18-24	44,848	16.4%	2.4% (1.0-3.5%)	$17 (<.001)	$760,153
25-44	96,349	35.2%	28.8% (24.5-33.5%)	$97 (<.001)	$9,325,255
45-64	95,432	34.8%	52.8% (46.9-59.0%)	$179[r]	$17,082,535
65+	37,357	13.6%	16.0% (12.5-19.4%)	$138 (.108)	$5,160,244
Married or de facto					
No	105,570	38.5%	29.0% (24.4-34.0%)	$89 (.002)	$9,373,263
Yes	168,415	61.5%	71.0% (64.3-78.0%)	$136[r]	$22,954,924
Highest completed qualification					
< Year 12	28,364	10.4%	17.6% (14.1-21.3%)	$201 (<.001)	$5,692,474
Year 12	71,728	26.2%	26.9% (22.3-31.6%)	$121 (.014)	$8,677,410
Trade certificate or diploma	50,152	18.3%	24.4% (20.2-28.8%)	$157 (<.001)	$7,897,840
Bachelor degree or higher	123,741	45.2%	31.1% (26.5-35.9%)	$81[r]	$10,060,463

a. Overall significance: differences between means across socioeconomic and demographic measures including non-gamblers (age p<.001, df=3; highest completed qualification p<.001, df=3).
b. Significance of difference between the mean and the reference group mean.
r. Reference group mean.

5.2 Socioeconomic and demographic expenditure shares for EGMs

Table 5.3 shows the breakdown of net expenditure on EGMs by socioeconomic and demographic groups. Mean losses were significantly higher for men than women, with men spending on average about twice as much on EGMs. Consequently, about two thirds of all money lost on EGMs came from men (65.6%). Mean expenditure did not differ significantly across age groups and so their expenditure shares were in keeping with their prevalence in the population. People who were married or living with a partner spent significantly less on average than those who did not ($137 compared with $228). Differences between educational groups were highly significant. People who did not have Year 12 education or post-school qualifications spent, on average, almost seven times as much on EGMs as those with degrees. Those with degrees accounted for just 15.7% of expenditure on EGMs; far less than expected given they represent 45.2% of the ACT adult population. In contrast, those with less than Year 12 education accounted for a quarter of all losses on EGMs even though they represent only about 1 in 10 of the population (10.4%).

Table 5.3: Net expenditure (in dollars) on EGMs in the last 12 months by socioeconomic and demographic characteristics.

Measure	N ACT population	Proportion adult population	Expenditure shares (95% CIs)	Mean losses[a] (p-value[b])	ACT population losses
Sex					
Women	140,078	51.1%	34.4% (25.7-44.2%)	$116 (.003)	$16,223,040
Men	133,907	48.9%	65.6% (53.8-78.9%)	$231[r]	$30,952,407
Age					
18-24	44,848	16.4%	13.1% (8.1-18.5%)	$138 (.374)	$6,192,738
25-44	96,349	35.2%	41.1% (29.7-51.4%)	$201 (.616)	$19,382,879
45-64	95,432	34.8%	35.2% (27.2-44.7%)	$174[r]	$16,597,029
65+	37,357	13.6%	10.6% (7.0-15.0%)	$134 (.283)	$5,002,800
Married or de facto					
No	105,570	38.5%	51.0% (40.7-63.1%)	$228 (.029)	$24,047,490
Yes	168,415	61.5%	49.0% (39.2-61.1%)	$137[r]	$23,127,957
Highest completed qualification					
<Year 12	28,364	10.4%	24.9% (17.6-33.2%)	$415 (<.001)	$11,758,847
Year 12	71,728	26.2%	37.6% (27.9-47.9%)	$247 (<.001)	$17,738,460
Trade certificate or diploma	50,152	18.3%	21.8% (14.0-29.6%)	$205 (<.001)	$10,287,049
Bachelor degree or higher	123,741	45.2%	15.7% (10.7-21.6%)	$60[r]	$7,391,090

a. Overall significance: differences between means across socioeconomic and demographic measures including non-gamblers (age p=.610, df=3; highest completed qualification p<.001, df=3).
b. Significance of difference between the mean and the reference group mean.
r. Reference group mean.

5.3 Socioeconomic and demographic expenditure shares for horse and greyhound races

Table 5.4 presents the socioeconomic and demographic breakdown of net expenditure on horse and greyhound races. Men, on average, spent over 10 times the amount spent by women and therefore accounted for the very large majority of the ACT population losses (91.7%). The 25-44 age group lost significantly more on average than the 45-64 years reference group (means of $208 and $84 respectively) and thereby accounted for most of the population spend (62.0%) even though they represent just 35.2% of adults in the ACT. Those not living with a partner also had higher average spend than those who did ($181 compared with $79) and therefore contributed disproportionately to losses on horse and greyhound races (59.0%). Once again, significant differences were found in relation to education, but it was those with Year 12 education and no post-school qualifications who showed the highest mean losses and accounted for almost half of the population spend (48.2%). Those with degrees had a disproportionately low expenditure share (20.9%).

Table 5.4: Net expenditure (in dollars) on horse or greyhound races in the last 12 months by socioeconomic and demographic characteristics.

Measure	N ACT population	Proportion adult population	Expenditure shares (95% CIs)	Mean losses[a] (p-value[b])	ACT population losses
Sex					
Women	140,078	51.1%	8.3% (4.6-15.7%)	$19 (.001)	$2,676,265
Men	133,907	48.9%	91.7% (67.8-131.0%)	$221[r]	$29,659,439
Age					
18-24	44,848	16.4%	12.9% (4.7-26.3%)	$93 (.888)	$4,174,961
25-44	96,349	35.2%	62.0% (40.0-102.9%)	$208 (.022)	$20,057,500
45-64	95,432	34.8%	24.8% (15.5-45.5%)	$84[r]	$8,012,367
65+	37,357	13.6%	0.3% (-22.9-17.7%)	$2 (.526)	$90,877
Married or de facto					
No	105,570	38.5%	59.0% (37.0%-95.8%)	$181 (.082)	$19,077,657
Yes	168,415	61.5%	41.0% (22.2%-67.1%)	$79[r]	$13,258,047
Highest completed qualification					
<Year 12	28,364	10.4%	13.6% (6.1-26.8%)	$155 (.126)	$4,399,851
Year 12	71,728	26.2%	48.2% (27.8-83.0%)	$217 (.023)	$15,599,850
Trade certificate or diploma	50,152	18.3%	17.3% (6.8-33.7%)	$112 (.353)	$5,592,073
Bachelor degree or higher	123,741	45.2%	20.9% (-1.4-41.6%)	$55[r]	$6,743,929

a. Overall significance: differences between means across socioeconomic and demographic measures including non-gamblers (age p=.094, df=3; highest completed qualification p=.135, df=3).
b. Significance of difference between the mean and the reference group mean.
r. Reference group mean.

5.4 Socioeconomic and demographic expenditure shares for scratch tickets

Net expenditure on scratch tickets did not show the degree of variation across population sub-groups as most other types of gambling (Table 5.5). Mean losses were very similar for men and women and did not differ significantly between those who lived with partners and those who did not. Losses were significantly lower for younger people (both 18-24 and 25-44 years) and collectively they contributed only 38.1% of ACT spending on scratch tickets when they represent 51.6% of the population. A gradient with education was again seen; people without Year 12 and no post-school qualifications losing twice as much on average as those with degrees, and other groups falling in between.

Table 5.5: Net expenditure (in dollars) on scratch tickets in the last 12 months by socioeconomic and demographic characteristics.

Measure	N ACT population	Proportion adult population	Expenditure shares (95% CIs)	Mean losses[a] (p-value[b])	ACT population losses
Sex					
Women	140,078	51.1%	52.9% (44.2-62.5%)	$15 (.696)	$2,066,798
Men	133,907	48.9%	47.1% (39.1-56.2%)	$14[r]	$1,839,524
Age					
18-24	44,848	16.4%	7.9% (4.9-11.0%)	$7 (<.001)	$306,704
25-44	96,349	35.2%	30.2% (23.5-37.4%)	$12 (.043)	$1,182,553
45-64	95,432	34.8%	44.5% (36.8-53.5%)	$18[r]	$1,738,995
65+	37,357	13.6%	17.4% (10.5-23.8%)	$18 (.932)	$678,070
Married or de facto					
No	105,570	38.5%	32.7% (26.0-40.1%)	$12 (.159)	$1,276,782
Yes	168,415	61.5%	67.3% (58.0-77.6%)	$16[r]	$2,629,540
Highest completed qualification					
<Year 12	28,364	10.4%	15.9% (10.8-21.2%)	$22 (.018)	$619,968
Year 12	71,728	26.2%	28.7% (21.9-36.1%)	$16 (.143)	$1,122,092
Trade certificate or diploma	50,152	18.3%	21.0% (16.0-26.6%)	$16 (.068)	$818,928
Bachelor degree or higher	123,741	45.2%	34.4% (27.0-42.1%)	$11[r]	$1,345,334

a. Overall significance: differences between means across socioeconomic and demographic measures including non-gamblers (age p=.012, df=3; highest completed qualification p=.049, df=3).
b. Significance of difference between the mean and the reference group mean.
r. Reference group mean.

5.5 Socioeconomic and demographic expenditure shares for table games at a casino

Socioeconomic and demographic expenditure shares for table games at a casino are shown in Table 5.6. Men, on average, lost over 20 times the mean found for women, and so the vast majority of ACT expenditure came from men (95.8%). Although there was a trend towards higher average expenditure in younger age groups, the differences were not statistically significant, and nor was the difference in losses by marital status. For educational qualifications, it was the group with Year 12 and no post-school qualifications that showed significantly higher mean losses whereas those without Year 12 had extremely low net expenditure on casino table games. The former accounted for 58.0% of ACT losses and the latter just 1.0%.

Table 5.6: Net expenditure (in dollars) on table games at a casino in the last 12 months by socioeconomic and demographic characteristics.

Measure	N ACT population	Proportion adult population	Expenditure shares (95% CIs)	Mean losses[a] (p-value[b])	ACT population losses
Sex					
Women	140,078	51.1%	4.2% (1.4-9.0%)	$2 (<.001)	$271,547
Men	133,907	48.9%	95.8% (68.1-132.8%)	$47[r]	$6,247,823
Age					
18-24	44,848	16.4%	35.2% (17.3-63.2%)	$51 (.058)	$2,295,213
25-44	96,349	35.2%	46.9% (24.5-78.4%)	$32 (.220)	$3,059,927
45-64	95,432	34.8%	17.2% (-3.0-38.8%)	$12[r]	$1,121,364
65+	37,357	13.6%	0.7% (0.0-1.8%)	$1 (.548)	$42,866
Married or de facto					
No	105,570	38.5%	51.1% (28.8-83.8%)	$30 (.385)	$3,188,424
Yes	168,415	61.5%	48.9% (21.3-82.8%)	$20[r]	$3,330,946
Highest completed qualification					
<Year 12	28,364	10.4%	1.0% (0.2-2.3%)	$2 (.036)	$64,409
Year 12	71,728	26.2%	58.0% (32.2-90.5%)	$53 (.007)	$3,778,630
Trade certificate or diploma	50,152	18.3%	23.7% (4.9-45.8%)	$31 (.176)	$1,547,207
Bachelor degree or higher	123,741	45.2%	17.3% (7.1-34.7%)	$9[r]	$1,129,124

a. Overall significance: differences between means across socioeconomic and demographic measures including non-gamblers (age p=.082, df=3; highest completed qualification p=.029, df=3).
b. Significance of difference between the mean and the reference group mean.
r. Reference group mean.

5.6 Socioeconomic and demographic expenditure shares for betting on sports or special events

Table 5.7 presents expenditure shares for betting on sports and special events. Betting by women was so rarely reported in the survey that it was impossible to estimate their net expenditure with any accuracy. Losses came predominantly from men (99.4%). Similarly, older people (65+) contributed very little. People who were not married or living with a partner spent over three times the average for those who did live with a partner and therefore contributed disproportionately to ACT expenditure on sports betting (68.7%). Average losses were higher for those with no post-school qualifications. Expenditure shares for those with post-school qualifications were well below the prevalence of these groups in the ACT population, both for people with trade certificates and diplomas (9.3%) and with degrees (14.4%).

Table 5.7: Net expenditure (in dollars) on sports or special events in the last 12 months by socioeconomic and demographic characteristics.

Measure	N ACT population	Proportion adult population	Expenditure shares (95% CIs)	Mean losses[a] (p-value[b])	ACT population losses
Sex					
Women	140,372	51.1%	0.6% (-0.2-1.7%)	$0 (<.001)	$55,443
Men	133,613	48.9%	99.4% (72.6-136.5%)	$69[r]	$9,197,508
Age					
18-24	44,706	16.4%	33.9% (12.8-61.8%)	$70 (.082)	$3,140,495
25-44	96,454	35.2%	46.3% (23.3-76.9%)	$44 (.164)	$4,280,133
45-64	94,794	34.8%	19.5% (5.7-37.8%)	$19[r]	$1,808,301
65+	38,030	13.6%	0.3% (0.0-0.6%)	$1 (.001)	$24,023
Married or de facto					
No	105,570	38.5%	68.7% (43.3-101.4%)	$60 (.019)	$6,354,686
Yes	168,415	61.5%	31.3% (14.1-57.3%)	$17[r]	$2,898,266
Highest completed qualification					
<Year 12	28,364	10.4%	19.7% (2.1-40.3%)	$64 (.179)	$1,828,271
Year 12	71,728	26.2%	56.6% (32.0-88.3%)	$73 (.002)	$5,236,218
Trade certificate or diploma	50,152	18.3%	9.3% (1.5-20.6%)	$17 (.686)	$857,721
Bachelor degree or higher	123,741	45.2%	14.4% (6.8%-28.0%)	$11[r]	$1,330,742

a. Overall significance: differences between means across socioeconomic and demographic measures including non-gamblers (age p=.084, df=3; highest completed qualification p=.016, df=3).
b. Significance of difference between the mean and the reference group mean.
r. Reference group mean.

5.7 Comparing socioeconomic and demographic expenditure shares across different types of activity

Figures 5.1 through 5.4 summarise the proportions of losses contributed by the several socioeconomic and demographic groups included in the previous tables (sex, age, marital status, and education). These figures provide a convenient means for comparing expenditure shares across different types of gambling activity. The first six columns show the expenditure shares for the six main activities covered in the present report, and the seventh column shows the expenditure shares for losses across all these activities combined. The final column of each figure shows the distribution of the relevant sub-groups in the ACT population.

Sex

Figure 5.1 shows that, for all activities except scratch tickets (where expenditure was fairly evenly split between men and women), disproportionately large losses were attributable to men, and this was found most strikingly for betting on sports and special events, table games at a casino, and horse and greyhound races.

Age

Figure 5.2 shows the extent to which younger age groups (the darker bands in the columns) contributed disproportionately to losses for particular activities, notably casino table games and sports and special events. As noted earlier, the 25-44 group accounted for the majority of betting losses on horse and greyhound races. The 45-64 age group contributed greater shares of lottery and scratch tickets. Net expenditure on EGMs largely came from the middle age groups (25 through 64) and, compared to losses on other activities, most closely approximated the prevalence of age groups in the population. Expenditure shares for the older age group (65 and over) were extremely variable across activities. Older adults in the ACT contributed just 0.3% of the population losses on sports and special events and on races but 17.4% of losses from buying scratch tickets.

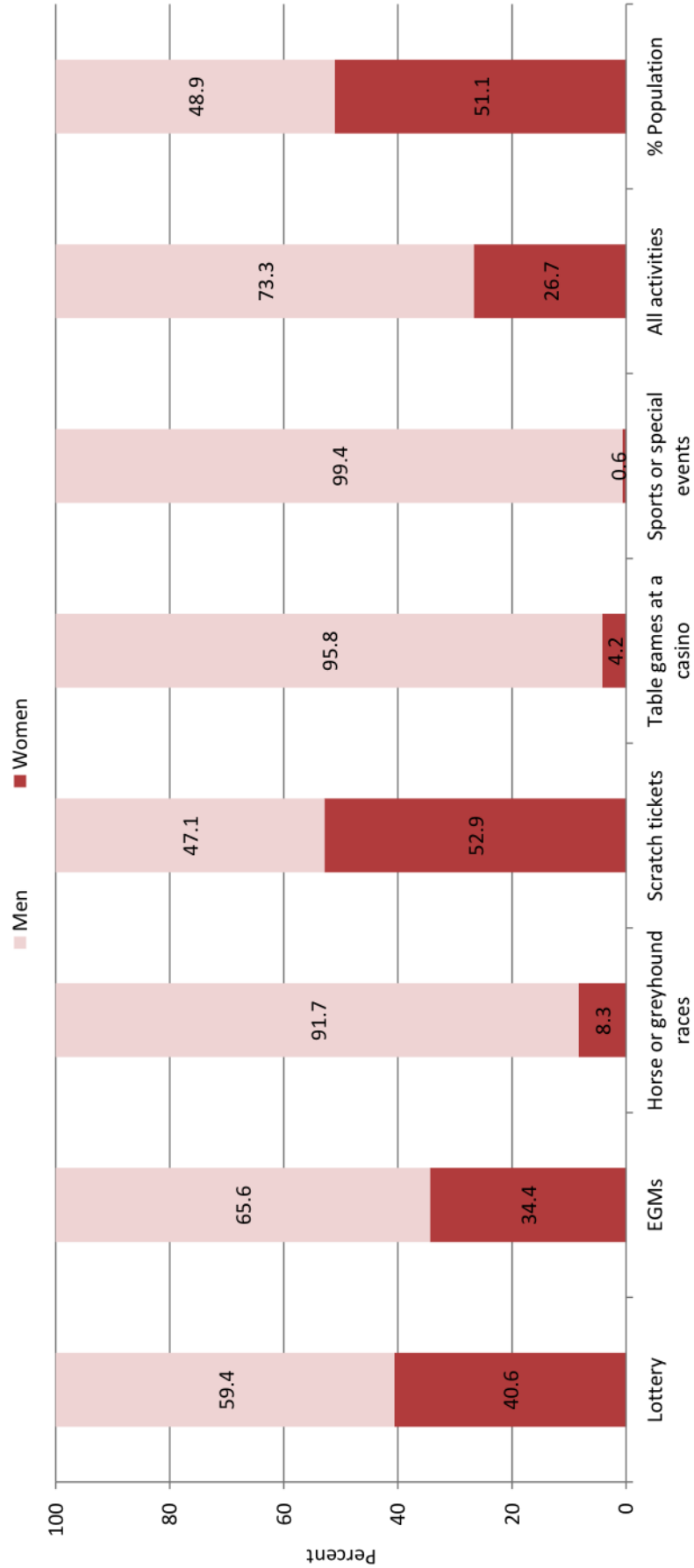

Figure 5.1: A summary of gambling expenditure shares (%) by type of activity amongst men and women.

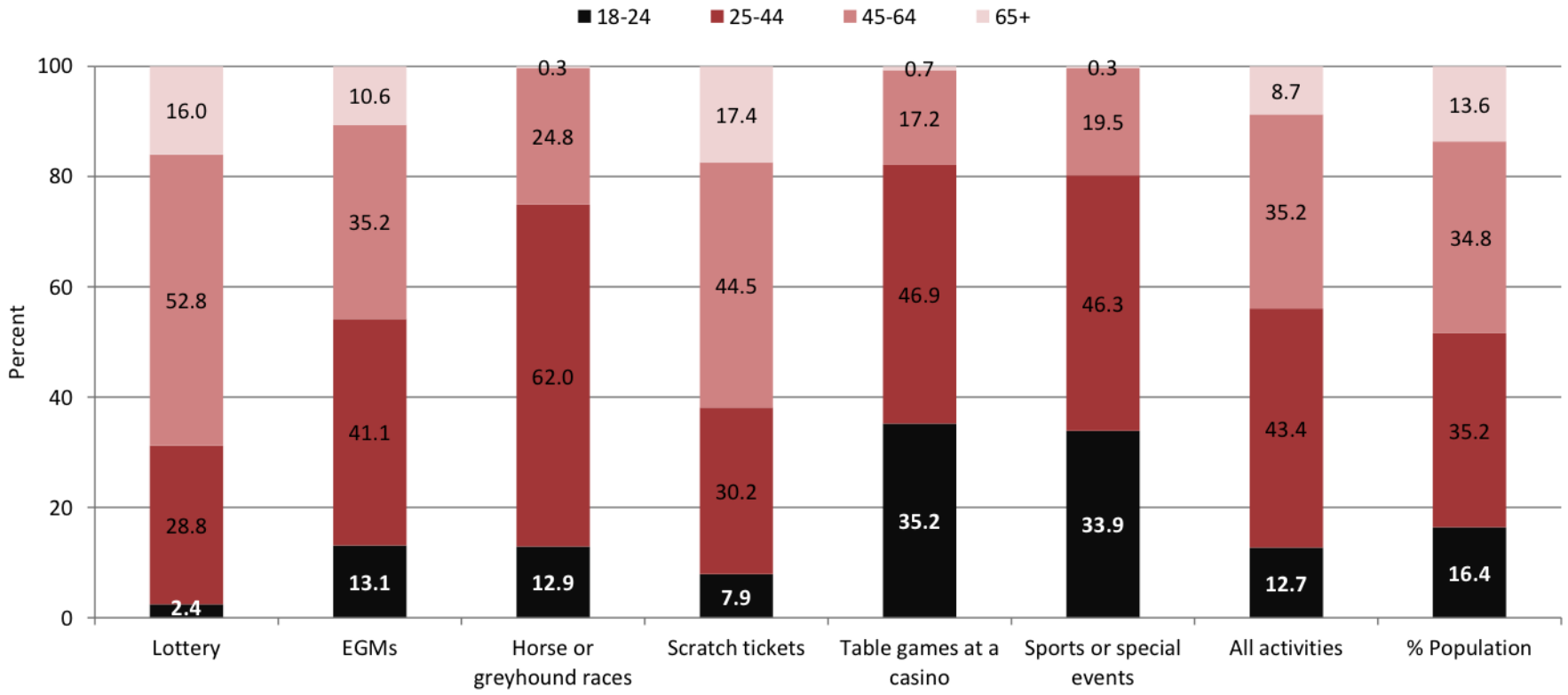

Figure 5.2: A summary of gambling expenditure shares (%) by type of activity amongst different age groups.

Marital status

The relative contributions to net expenditure of those with partners (married or de facto) and those without partners were less variable across types of gambling activity than other socioeconomic and demographic differences included in our analyses (Figure 5.3). Net expenditure on lottery and scratch tickets were the only instances where those with a current partner contributed disproportionately more to population losses. The most notable activity where losses were disproportionately attributable to people without partners was sports and special events.

Education

Although there was an overall trend where those with lower education contributed more to gambling losses across all activities, there was considerable variation in the pattern between different activities (Figure 5.4). Variability was striking for those who have less than Year 12 education; they contributed a very small amount to losses on casino table games (1.0%) but a disproportionately high amount to EGM losses (24.9%) given that they represent just over 10% of the ACT population. People with Year 12 education (but no post-school qualifications) were substantial contributors to losses on sports and special events, table games at a casino and to losses on horse and greyhound races. The group with trade certificates or diplomas disproportionately contributed to table games at a casino and lottery. Figure 5.4 also shows considerable variability for people with degree-level qualifications who contributed only 14.4% of losses on sports and special events and 15.7% on EGMs but about a third of the population losses on scratch tickets (34.4%) and lottery (31.1%). Even with the latter, however, this still represented disproportionately low expenditure given that 45.2% of participants have degrees. There are no activities where disproportionately high gambling losses are derived from people with degree-level qualifications.

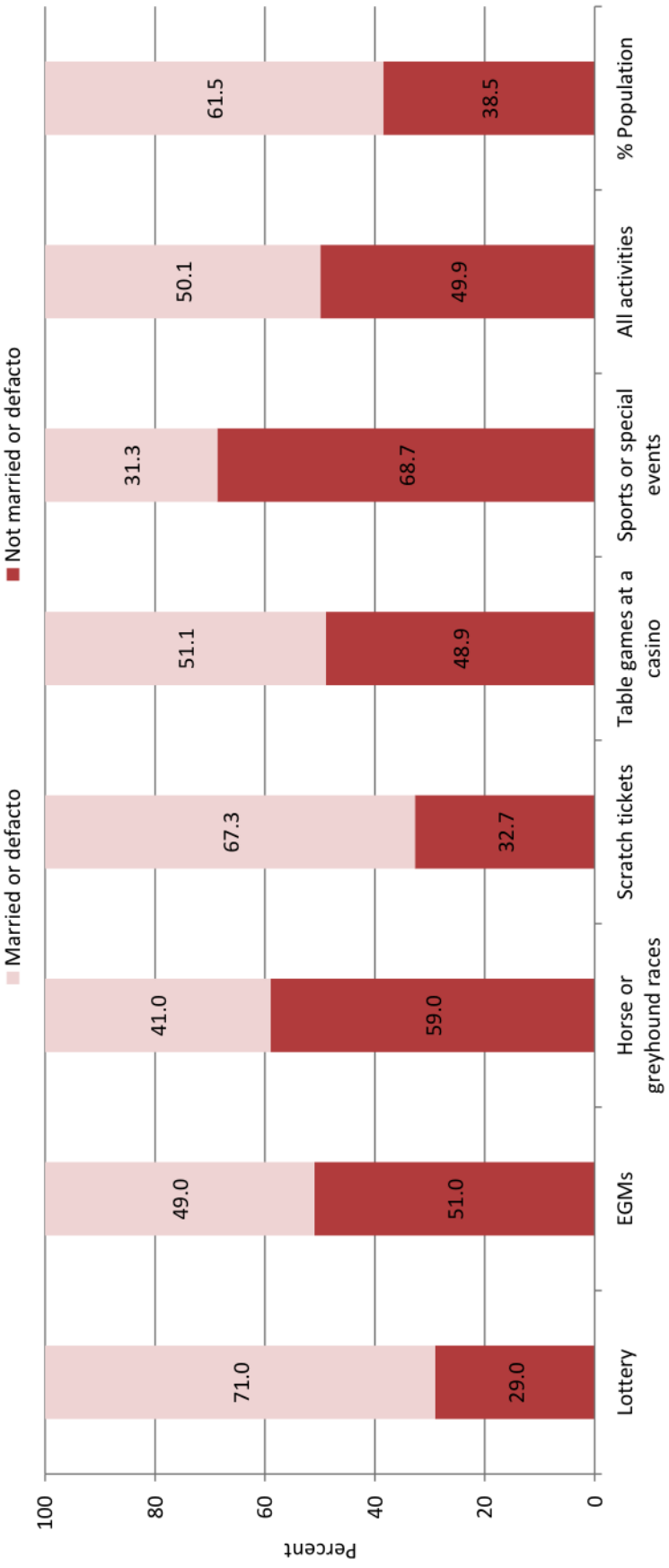

Figure 5.3: A summary of gambling expenditure shares (%) by type of activity amongst marital status groups.

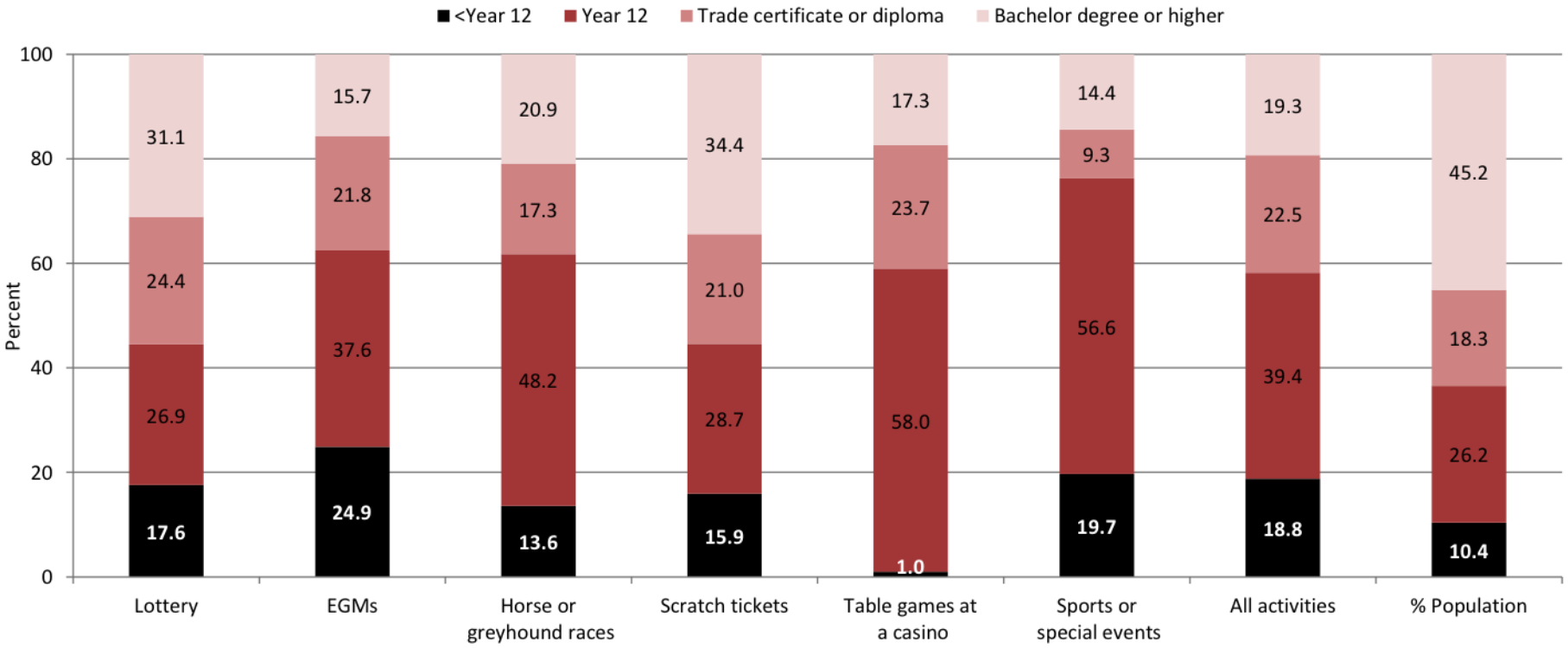

Figure 5.4: A summary of gambling expenditure shares (%) by type of activity amongst highest completed qualification groups.

5.8 Comparing findings from the uncapped and capped analysis

The Appendix presents comparable findings for expenditure shares across socioeconomic and demographic categories using the Winsorised (capped) measures of expenditure. Tables 10.10 through 10.15 can be compared with Tables 5.1 to 5.6 in the present chapter. (Note that capping could not be applied to net expenditure on sports and special events.) Overall, the findings are highly consistent between uncapped and capped analyses with very minor variations in the estimates of expenditure shares.

Key Findings of Chapter 5

1. Considering net expenditure across all forms of gambling, disproportionately high losses come from men, single people (neither married nor living with a partner), and from people with lower levels of education. Total gambling losses are drawn fairly evenly from different age groups.
2. The pattern of losses by people with different socioeconomic and demographic characteristics varies across gambling activities.
3. Buying scratch tickets is the only major gambling activity where women and men lose similar amounts. By contrast, men account for over 90% of gambling losses on sports and special events, casino table games, and horse and greyhound races.
4. Younger age groups contribute disproportionately to expenditure on table games at a casino and sports and special events, whereas older age groups contribute more to net expenditure on lottery and scratch tickets. The 25-44 age group accounts for the largest proportion of losses on horse and greyhound races.
5. Although single people typically lose more money gambling than people who have a spouse or partner, lottery and scratch tickets are exceptions to this generalisation.
6. The most striking differences in gambling losses are seen in relation to education. Net expenditure across all activities by people without either Year 12 education or post-school qualifications is more than four times that of people with degrees. For EGMs and betting on sports and special events the differences are even greater, with the least qualified losing 6 to 7 times the amount of people with degrees.

Chapter 6: Methods used for comparisons with industry data

This chapter describes the Australian Gambling Statistics (AGS) industry data for the ACT (Australian Gambling Statistics, 2014) and details the methods used to compare AGS figures with net expenditure estimates obtained from the 2009 ACT Prevalence Survey data (Davidson and Rodgers, 2010).

6.0 Australian Gambling Statistics (AGS) items and survey measures

In this section, net expenditure information reported by AGS is compared to the 2009 ACT Survey questions. As mentioned in the introduction, it is important to note that the purpose and scope of these two data sources differ substantially. The AGS expenditure data aim to track turnover and net expenditure within defined geographical areas but the 2009 ACT Survey data aim to investigate net expenditure linked to characteristics of individuals. AGS data include money lost in ACT venues by people who do not reside in the ACT. On the other hand the 2009 ACT Survey data include money that has been lost gambling by ACT residents when outside the territory. These are overarching limitations in the comparability of all AGS and survey data.

AGS includes data about a range of gambling activities including: (i) racing; (ii) the ACT Casino; (iii) EGMs; (iv) instant lottery (scratch tickets); (v) Keno; (vi) lotteries, lotto games and pools; (vii) minor gaming; and (viii) sports betting.

Racing: Gambling on races can be done through a large number of venues, both on and off course. AGS data for races includes net expenditure from betting on horse and greyhound races via on-course and off-course bookmakers, on-course totalisers and the TAB. However, there are only limited data available regarding losses via off-course bookmakers. In the ACT (and some other jurisdictions) there are no such data available. In contrast, the 2009 ACT Survey contained four items covering net expenditure on horse or greyhound races: (i) at a race track; (ii) at an off course venue (defined as a TAB, club, hotel or casino); (iii) by 'phone; and (iv) via the internet. Consequently, the AGS and ACT Survey data are not directly comparable.

Table games at a casino: In the ACT there is only one casino and there are no EGMs in this venue. Data on keno (see below) is reported separately from table games. The 2009 ACT Survey included a single question covering net expenditure on 'table games at a casino'. As such AGS net expenditure data from the casino is comparable with the survey item.

Electronic gaming machines: As mentioned above, there are no EGMs in the ACT Casino. EGMs are only located in clubs and hotels/pubs (with the vast majority in the former). AGS notes that "gaming machines accurately record the amount of wagers played on the machines" so turnover and expenditure reflect actual figures for each jurisdiction (Australian Gambling Statistics, 2014: p3). The 2009 ACT Survey asked a single item directly covering net expenditure on 'poker and gaming machines'. The AGS and 2009 ACT Survey data were considered comparable.

Scratch tickets (instant lottery): AGS notes that prizes in the instant lottery are paid on a set return to player and are based on the number of tickets in a set, the cost to purchase the tickets, and a set percentage retained by the operator for costs (Australian Gambling Statistics, 2014: p4). AGS data reflect all expenditure on scratch tickets sold within the ACT. In contrast, the 2009 ACT Survey only asked people who reported purchasing at least some instant scratch tickets for themselves about their net expenditure. Otherwise the data sources were considered comparable.

Keno: In the ACT, only the TAB runs Keno. The 2009 ACT Survey asked a single item assessing net expenditure on Keno and, as such, the data sources were considered comparable.

Lotteries, lotto and the Pools: AGS defines *lotteries* as involving 'three main components, the purchase of a ticket, a draw and a prize (Australian Gambling Statistics, 2014: p4). A person whose ticket is selected in a lottery wins a prize. There are a wide range of *Lotto* games including Tattslotto, Lotto and Powerball. AGS defines *Lotto* as games 'where a player selects eight numbers from 1 to 45 in anticipation that those numbers will be among those, randomly drawn from these 45 balls. A player wins if their selected numbers match those randomly drawn in set combinations' (p 5). Pools is defined as 'a numbers game of chance where the winning numbers are based on the results of the United Kingdom or Australian soccer matches. Each week 38 soccer matches are selected to form a 'match list'. Each match is assigned a number from 1 to 38. Players select six numbers from the 38. If the selected numbers are the same as the official results numbers, the player wins one of five prize divisions' (Australian Gambling Statistics, 2014: p3). The same operators may conduct lotto, pools, and instant lottery and data for these three types of games were combined for the purposes of this report.

The 2009 ACT Survey asked people whether they had played lotto or any other lottery game like Tattslotto, Powerball, the Pools or $2 jackpot lottery in the last 12 months. People who reported doing so for themselves were read a more detailed list of such games and given a single item assessing their net expenditure on 'lotto or any other lottery game'. These games are referred to as lottery in the current report and data sources are considered comparable.

Sports betting: In AGS, sports betting is defined as 'wagering on approved types of local, national or international sporting activities (other than the established forms of horse and greyhound racing), whether on or off-course, in person, by telephone, or via the internet' (Australian Gambling Statistics, 2014: p6) . Information about sports betting was not available in AGS for the ACT. In contrast the 2009 ACT Prevalence Survey asked three items assessing net expenditure betting on 'sporting or special events like football, cricket, tennis, a TV show or election' (i) in person, (ii) by phone, and (iii) via the internet. The data sources were not comparable.

Minor gaming: The AGS defines minor gaming as a collective name given to raffles, bingo, lucky envelopes and the like (Australian Gambling Statistics, 2014: p5). It was not possible to get a break down of individual activities, such as bingo, in the ACT. Therefore items included in the 2009 ACT Survey, including bingo, were not comparable to AGS industry data.

6.1 Statistical methods

Population estimates

To maximise comparability of industry and survey data, the methods used in this report replicate the AGS report. Given that AGS is largely collated for taxation purposes, the estimates pertain to financial years. The ABS provides population size estimates for calendar years. To estimate the total ACT adult population during the period of a financial year (as opposed to the population at the end of the calendar year) AGS reports annual per capita expenditure based on the adult population averaged over adjacent years.

The ACT Survey interviews were undertaken through October and November 2009 and asked about gambling behaviour during the last 12 months. The questions on net gambling expenditure therefore spanned both the 2008-09 and 2009-10 financial years. In order to ensure that the population size reflected the time period of

survey items the adult population size for both financial years was calculated by averaging the adjacent calendar years (Australian Bureau of Statistics, 2010). In the financial years 2008-09 and 2009-10 the adult population was estimated at 271,307 and 276,664, respectively. The average of the 2008-09 and 2009-10 financial year population estimates was then calculated (i.e. 273,985 adults). All survey estimates of net expenditure for the total adult ACT population were scaled to reflect 273,985 adults. For the purposes of the current report, the average of the 2008-09 and 2009-10 AGS figures on expenditure was used and, consequently, the industry data also represent net expenditure for 273,985 adults. Per capita and ACT adult population losses are reported for each activity (where feasible) from both the 2009 ACT Survey and AGS data.

In the following chapter all survey data analysis were weighted to compensate for potential bias arising from the finding that higher frequency gamblers were more likely to have missing data on total expenditure than lower frequency gamblers (see section 3.7 of Chapter 3).

Chapter 7: Comparing industry and survey data

The main aims of this chapter are to:

1. report AGS industry gambling expenditure data alongside findings from the 2009 ACT Prevalence Survey;
2. adjust the ACT prevalence survey data to match the AGS industry data on specific gambling activities; and
3. evaluate the impact of compensating the ACT Survey data to better match AGS industry data.

Parallel analyses using the capped financial loss measures are presented in the Appendix (Tables 10.16 through 10.20).

7.0 Per capita and aggregate expenditure: comparing industry and survey data

Table 7.1 shows net expenditure by type of activity (A) averaged over 2008/09 and 2009/10 financial years from the ACT AGS data and (B) during the last 12 months as reported in the 2009 ACT Survey. For industry data, per capita and ACT population estimates are given. For survey data, mean net expenditure was estimated and these figures were multiplied by the number of ACT adults to reflect ACT population losses. As discussed in the previous chapter, AGS industry data on expenditure were not available for some activities (e.g. sports betting) or was not comparable to the 2009 ACT Survey data (e.g. for races). However, several activities were comparable and the differentials between the AGS and 2009 ACT Survey data were estimated for these activities, by dividing the AGS by the ACT Survey estimates (ratios in last column). In this column, a value of 1 would indicate that the ACT Survey estimates and AGS industry data provided exactly the same figures. Values greater than 1 indicate that the AGS figures are larger than the ACT Survey estimates. Values less than 1 indicate that the survey estimates are less than the industry figures. Table 7.1 only includes activities that were assessed as comparable.

In terms of individual activities, AGS industry data indicate that more than $19 million was lost on lottery in the ACT ($70 per capita). In contrast, the ACT Survey data indicate that ACT adults lost more than $32m on lottery ($118 per adult). In this instance, net expenditure as determined by survey data was substantially greater (almost 70% greater) than that reported in industry data. Similarly, for scratch tickets the amount of money lost was substantially greater in the 2009 ACT Survey than the AGS industry data (double). In contrast, for EGMs and table games at a casino, the AGS industry data on net expenditure for the ACT were 3.7 and 3.0 times greater respectively than indicated by self-reports in the ACT Survey.

Table 7.1: Per capita and ACT population gambling losses by activity: derived from AGS industry data and the ACT Prevalence Survey.

Activity	(A) AGS INDUSTRY DATA*		(B) ACT SURVEY DATA**		Ratio of industry to survey data (A/B)
	Per capita expenditure	ACT population losses	Mean expenditure	ACT population losses	
Lottery	$70	$19,111,838	$118	$32,328,187	0.59
Scratch tickets	$7	$2,020,546	$14	$3,906,322	0.52
EGMs	$636	$174,298,529	$172	$47,175,447	3.69
Casino	$70	$19,307,725	$24	$6,519,370	2.96
Keno	$3	$926,256	$11	$2,894,973	0.32

*Source: Australian Gambling Statistics (2014).
**Source: Table 4.1, p45

7.1 Expenditure by type of activity using compensated survey data

This section presents a hypothetical scenario, but has the aim of deriving a concrete outcome. As discussed in the introduction, there are instances where the advantages of industry and survey data have been acknowledged and estimates have been combined. For instance, the Productivity Commission applied the problem gambling expenditure share proportions (as estimated in self report surveys) to the baseline expenditure figures reported by industry, in order to estimate the total amount of money lost by moderate risk/problem gamblers in Australia. It is also possible to adjust survey data to compensate for lower estimates of gambling losses compared to those indicated by industry data. This adjustment would take into account any 'underreporting' of expenditure common to self-report surveys. The purpose of this section is to test the feasibility of adjusting survey data in this manner, and to assess the consequences of compensation. Table 7.1 showed that net expenditure on EGMs and table games at a casino were lower in the ACT survey data compared with AGS industry data. We therefore adjusted the ACT Survey data for these two activities, using the ratios obtained in Table 7.1.

Figure 7.1a shows the distribution of net expenditure across different types of activity. Figure 7.1b shows net expenditure after applying the compensation ratios for EGMs and table games at a casino. The proportion of losses attributed to these activities necessarily increases after compensation.

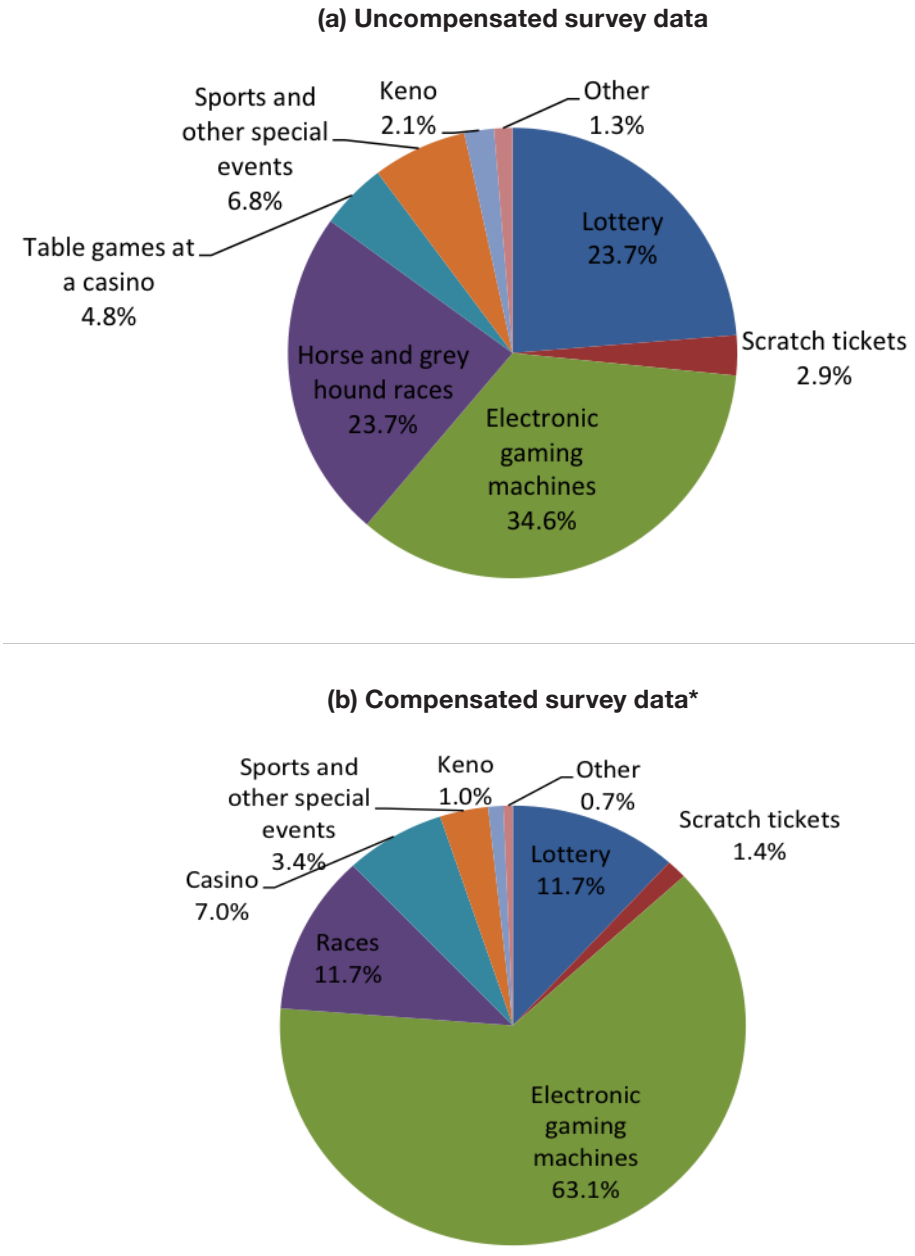

Figure 7.1: Total net expenditure by type of activity across all survey participants.
*Compensated so that EGMs and table games at a casino reflect industry-reported expenditure.

Figure 7.2 shows the distribution of net expenditure across different types of activity taken from industry data only. Comparing across figures, the compensated survey data (Figure 7.1b) more closely resemble the industry data than do the uncompensated survey data (Figure 7.1a). This is to some extent inevitable as the proportions in figure 7.1b were calculated by forcing dollar expenditure on EGMs and casino table games from the ACT Survey to equal the figures reported by the AGS. However, it can be seen that the compensation also has the effect of reducing the proportions of expenditure on other activities, notably races and lottery, bringing them more into line with industry estimates.

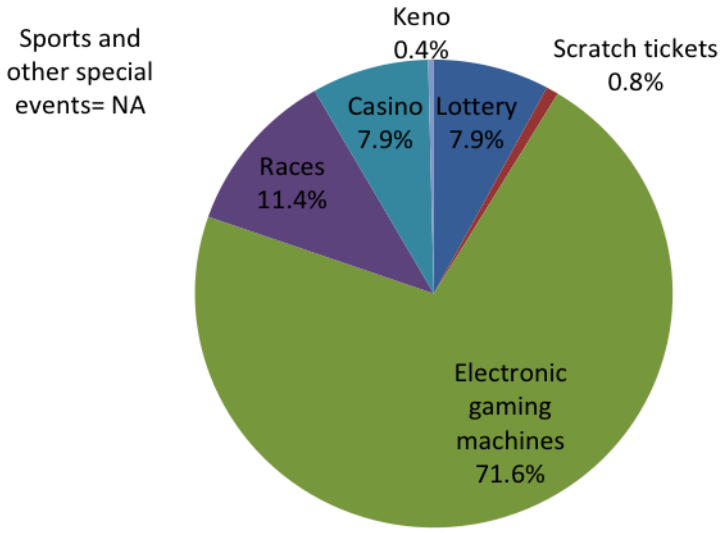

Figure 7.2: Total net expenditure by type of activity using industry data.

Source: Australian Gambling Statistics (2014).

7.2 Problem gambling expenditure shares for all activities using compensated survey data

It is possible that 'underreporting' might have biased the estimation of problem gambling expenditure shares presented in Chapter 4. We therefore assessed the impact of adjusting the ACT Survey data on EGM and casino table game losses by repeating the estimates of net expenditure across PGSI categories using compensated data. Table 7.2 shows net expenditure on all activities across PGSI categories using the compensated data. This table simply shows that the compensation necessarily increases the estimate of total net expenditure (relative to uncompensated findings shown in Table 4.2) to over $276M, i.e. more than doubling the original estimate.

Table 7.2: Expenditure on all activities in the last 12 months using compensated survey data[†] by the PGSI.

PGSI category	N ACT population	Proportion adult population	Expenditure shares (95% CIs)	Mean losses	ACT population losses
Non-gambler	88,894	32.4%	-	$0	$0
Non-problem	170,769	62.3%	36.7% (30.3-44.9%)	$593	$101,320,801
Low risk	9,338	3.4%	30.2% (22.2-39.7%)	$8,918	$83,274,997
Moderate risk	3,664	1.3%	19.8% (14.7-27.0%)	$14,893	$54,568,658
Problem	1,320	0.5%	13.4% (10.4-18.5%)	$28,005	$36,966,833

[†]Compensated so that EGMs and table games at a casino reflect industry-reported expenditure.

Figure 7.3 depicts the distribution of net expenditure on all activities by level of problem gambling. The left-hand side of the graph (labelled 'a') is exactly as presented in Chapter 4. Column (a) of Figure 7.3 indicates that 55.1% of net expenditure on gambling came from people with gambling symptoms (PGSI 1+) based on uncompensated data and that 27.1% was accounted for by moderate risk/problem gamblers (PGSI 3+). The middle section of the graph (labelled 'b') compensates for the lower survey-reported net expenditure on EGMs and table games at a casino relative to AGS industry data. After compensation, 63.3% (95% CI 53.1-76.8%) of net expenditure was attributable to people with some gambling symptoms, and 33.2% (95% CI 26.6-42.4%) was accounted for by moderate risk/ problem gamblers (PGSI 3+). The right-hand side of the graph presents the distribution of problem gambling in the adult gambling population. Overall, this figure shows that compensating survey data, so that they better reflect industry data on the two activities, increases estimates of the proportion of expenditure coming from people with gambling problems.

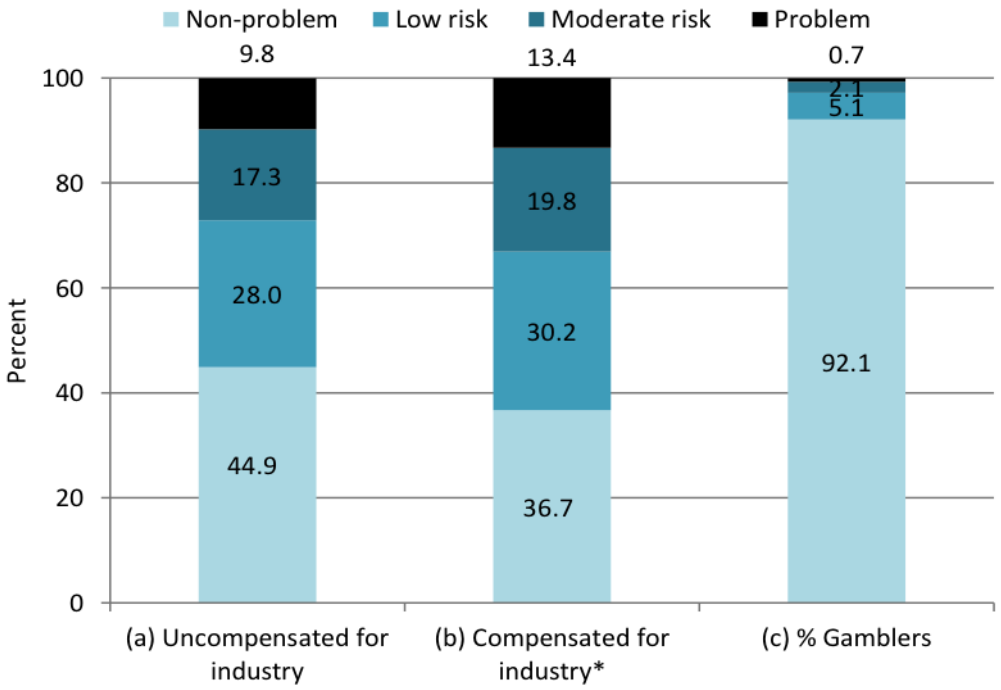

Figure 7.3: Proportion of expenditure on all activities by level of problem gambling.

*Compensated so that EGM and table games at a casino reflect industry data.

7.3 Socioeconomic and demographic gambling expenditure shares for all activities using compensated survey data

We also investigated the impact of compensation on estimates of socioeconomic and demographic expenditure shares for all activities combined. The third column in Table 7.3 shows the proportion of net expenditure for socioeconomic and demographic subgroups based on uncompensated data, as presented in Chapter 5. Columns 4 to 6 of the table are based on the ACT Survey data compensated for potential underreporting of expenditure on EGMs and table games at a casino. These additional analyses demonstrate that compensation makes little difference to the estimation of expenditure shares across sex, age, marital status and qualification groups.

Overall, the findings suggest that socioeconomic and demographic expenditure shares estimates are robust and little influenced by the underreporting of gambling losses in self-report surveys.

Table 7.3: Net expenditure (in dollars) on all activities in the last 12 months by socioeconomic and demographic characteristics.

Measure	N ACT population	Proportion adult population	NOT COMPENSATED	COMPENSATED TO MATCH AGS INDUSTRY†		
			Expenditure shares	Expenditure shares (95% CIs)	Mean losses	ACT population losses
Sex						
Women	140,078	51.1%	26.7%	29.2% (22.9-36.2%)	$576	$80,628,694
Men	133,907	48.9%	73.3%	70.8% (61.3-81.6%)	$1,460	$195,502,595
Age						
18-24	44,848	16.4%	12.7%	14.0% (9.4-19.0%)	$859	$38,525,946
25-44	96,349	35.2%	43.4%	42.5% (33.7-51.7%)	$1,217	$117,299,688
45-64	95,432	34.8%	35.2%	34.4% (28.0-42.2%)	$994	$94,905,361
65+	37,357	13.6%	8.7%	9.2% (6.012.9%)	$680	$25,400,294
Married or de facto						
No	105,570	38.5%	49.9%	50.4% (41.7-60.2%)	$1,317	$139,067,913
Yes	168,415	61.5%	50.1%	49.6% (41.1-59.3%)	$814	$137,063,376
Highest completed qualification						
< Year 12	28,364	10.4%	18.8%	20.8% (15.5-27.0%)	$2,024	$57,403,589
Year 12	71,728	26.2%	39.4%	39.4% (30.9-48.7%)	$1,518	$108,877,042
Trade certificate or diploma	50,152	18.3%	22.5%	22.2% (16.4-25.8%)	$1,224	$61,380,411
Bachelor degree or higher	123,741	45.2%	19.3%	17.6% (12.8-22.8%)	$392	$48,470,246

† Compensated so that net expenditure on EGMs and table games at a casino reflected industry data.

Key Findings of Chapter 7

1. Industry and self-report survey data have different purposes, advantages and disadvantages.
2. For some activities, self-reported expenditure estimates were greater than industry figures (lottery and scratch tickets), but for other activities (EGMs and table games at a casino) self-report estimates were substantially less than industry figures.
3. Self-reported survey data for some activities can be compensated so that they more closely reflect industry figures.
4. Estimates of gambling expenditure share presented in previous chapters were robust in that they changed little after compensating the survey data. Problem gambling expenditure share is slightly increased by compensation.

Chapter 8: Discussion

8.0 Summary of main findings

Problem gambling expenditure share (PGES) for all activities combined

The PGES for overall net gambling expenditure (without the compensation adjustment) was estimated at 27% based on the cut-point of a PGSI score of three or more (Figure 4.2). That is, 27% of gambling revenue in the ACT is derived from the 3% of gamblers (and just 2% of the adult population) who were assessed as being moderate risk or problem gamblers. These estimates changed a little when the compensation adjustment was applied to self-reported net expenditure on EGMs and for casino games, which increased the PGES to 33%.

The present study looked beyond the use of the threshold of a PGSI score of three or more, however. If a lower threshold is applied so that any reported PGSI symptoms is used, then the estimate of PGES would be 55% based on non-compensated self-reports and 63% using compensated data. The majority of gambling revenue in the ACT is therefore derived from people that report some degree of problem gambling.

Problem gambling expenditure share for different activities

Estimates of PGES vary considerably across different types of gambling in the ACT. Based on the threshold of a PGSI score of three or more, the highest PGES estimates were found for EGMs (41%), sports/special events betting (41%), horse and greyhound racing (24%), and casino table games (20%). Much lower estimates of PGES were found for scratch tickets (10%) and for lotteries (5%). Again, higher estimates are obtained if any PGSI symptom is used to identify those with a degree of gambling problem. With the lower threshold, estimates of PGES are: EGMs (72%), sports/special events betting (55%), horse and greyhound racing (71%), casino table games (67%), scratch tickets (18%), and lotteries (13%). Other than betting on scratch tickets and lotteries, the majority of net expenditure on the main gambling activities in the ACT is by people with some degree of problem gambling.

Male gambling expenditure share (MGES)

The MGES for overall net gambling expenditure (without the compensation adjustment) was estimated at 73% based on the cut-point of a PGSI score of three or more (Figure 5.1), i.e. about three-quarters of gambling revenue in the ACT is derived from men. This estimate was little changed when the compensation adjustment was applied to self-reported net expenditure on EGMs and for casino games, which decreased the MGES to 71%.

MGES varies across different types of gambling activity. The highest estimates were 99% for sports/special events, 96% for casino table games, 91% for horse and greyhound races, and 67% for EGMs. For lotteries, men accounted for 60% of expenditure in the ACT, but only 46% of revenue on scratch tickets was derived from men.

Young people gambling expenditure share (YPGES)

The YPGES for overall net gambling expenditure (without the compensation adjustment) was estimated at 13% (Figure 5.2), i.e. about one-eighth of gambling revenue in the ACT is derived from adults aged 18 to 24 years. This group represents 16% of the adult population so they are slightly below average contributors to ACT gambling revenue and do not differ significantly from the population average. The estimate was little changed when the compensation adjustment was applied to self-reported net expenditure on EGMs and for casino games, which increased the YPGES to 14% (Table 7.3).

YPGES varies across different types of gambling activity. The highest estimates were 34% for casino table games and 32% for sports/special events. For EGMs, young people accounted for 15% of expenditure in the ACT. Only 13% of revenue from horse and greyhound races, 8% of revenue from scratch tickets and 2% of revenue from lottery gambling was derived from young people. In other words, young people in the ACT contribute more than the average to betting on sports/special events and casino table games, but less than average to other types of betting.

Older people gambling expenditure share (OPGES)

The OPGES for overall net gambling expenditure (without the compensation adjustment) was estimated at about 9% (Figure 5.2), i.e. less than one-tenth of gambling revenue in the ACT is derived from adults aged 65 years or older. This group represents 14% of the adult population so they are below average contributors to overall ACT gambling revenue. The estimate was little changed when the compensation adjustment was applied to self-reported net expenditure on EGMs and for casino games (Table 7.3).

OPGES varies across different types of gambling activity. The highest estimates were 19% for scratch tickets, 16% for lottery and 11% for EGMs. The proportion of revenue derived from older people was much lower for other types of gambling: just 0.6% for horse and greyhound racing; 0.8% for casino table games; and 0.2% for betting on sports and special events. So, older people in the ACT contribute more than the average to spending on lotteries and scratch tickets, but less than average to other types of betting.

Single people gambling expenditure share (SPGES)

The SPGES is an estimate based on adults who were not living with a spouse or partner at the time of their 2009 Survey interview, and includes people who were never married, divorced or separated, or widowed. The SPGES for overall net gambling expenditure (without the compensation adjustment) was estimated at 50% (Figure 5.3), i.e. one-half of gambling revenue in the ACT is derived from adults who are not living with a spouse or partner. This group represents about 39% of the adult population so they are above average contributors to ACT gambling revenue. The estimate was little changed when the compensation adjustment was applied to self-reported net expenditure on EGMs and for casino games.

SPGES varies across different types of gambling activity. The highest estimates were 66% for sports/special events, 60% for horse and greyhound races, and 52% for EGMs. For casino table games, single people accounted for 47% of net expenditure in the ACT, while 33% of revenue from scratch tickets and just 29% of revenue from lotteries was derived from single people. Single people in the ACT, therefore, contribute more than the average to expenditure on sports/special events, horse and greyhound races, and EGMs, but less than average to other types of betting.

Low education gambling expenditure share (LEGES)

The LEGES for overall net gambling expenditure (without the compensation adjustment) was estimated at 19% (Figure 5.4), i.e. almost one-fifth of gambling revenue in the ACT is derived from adults who have not reached Year 12 education and who have no post-school qualifications. This group represents 10% of the adult population so they are above average contributors to overall ACT gambling revenue. The estimate was slightly increased when the compensation adjustment was applied to self-reported net expenditure on EGMs and for casino games, which increased the LEGES to 21%.

LEGES varies considerably across different types of gambling activity. The highest estimates were 24% for EGMs, 18% for lotteries and for betting on sports and special events, and 16% for scratch tickets. The proportion of revenue derived from people with lower education was less for other types of gambling at 14% for horse and greyhound racing; and just 1% for casino table game. In other words, people with lower education in the ACT contribute less than the average to spending on casino table games but more than average to net expenditure on all other types of betting. At the other end of the qualification spectrum, people with degree-level qualifications spend less on average across every type of gambling activity analysed here compared with those who do not have degrees. Their lower than average net expenditure was most marked for betting on sports and special events, EGMs and casino table games (Figure 5.4).

Comparison of self-report and industry reported expenditure data

For many types of gambling activity, it was not possible to make a direct comparison between published industry figures (AGS) for the ACT and the self-reported expenditure in the 2009 Survey. However, self-reported net expenditure for both casino table games and for EGMS were considerably less than might be expected from the AGS industry data. The self-reported figures for EGMs are highly likely to reflect under-reporting by participants although there could also be a contribution from bias due to non-responding. That is, people' who spend more money than average on EGMs may have been less likely to participate in the interviews, either because they could not be contacted by 'phone or because they refused to participate if contacted.

It is difficult to interpret the low self-reports for expenditure on casino table games because we have no information on how much ACT residents spend on this type of gambling at venues outside of the ACT or, conversely, how much non-residents of the ACT spend on table games in the Canberra casino. Crucially, however, the use of compensation factors to weight self-reported expenditure, so as to bring up the total reported spending on EGMs and casino table games to match the industry data, made very little difference to the important analyses presented throughout this report, either for PGES and for other estimates of gambling expenditure shares. This demonstrates that general concerns about the validity of self-reported expenditure data are of little relevance to the aims of the present study or the particular analyses carried out.

In addition to the low estimates of self-reported net expenditure on casino table games and EGMs, the 2009 Prevalence Survey yielded extremely high estimates of betting on Keno. There is no simple explanation for this, although a contributory factor could be the expenditure of ACT residents outside of the territory. We have not presented separate findings for betting on Keno specifically (although this type of betting is included in overall self-reported net expenditure).

8.1 Placing the ACT findings in context

Problem gambling expenditure share (PGES)

Our estimates of PGES are similar to estimates from a number of previous studies. The 2011 and 2013 Tasmanian surveys have been the only Australian studies to estimate the PGES using the PGSI. The 2011 Tasmanian survey, conducted closer in time to the 2009 ACT Survey, reported a PGES of 23% (The Allen Consulting Group *et al.*, 2011) compared with 27% in the ACT. Other Australian studies reporting PGES have used SOGS as a measure for problem gambling and are not directly comparable with the current study (Productivity Commission,1999; Young *et al.*, 2006). Estimates of PGES in Canada using the PGSI cut of three

or more have ranged from a low of 19% in Manitoba to a high of 38% in Ontario (Williams & Wood, 2004) so problem gamblers in the ACT are in the middle of the range of estimates of the share of gambling expenditure for their counterparts in Canada.

When over a quarter of gambling revenue comes from 3% of gamblers (and just 2% of the adult population) the implication is that those with problems are spending a great deal more than other gamblers. Moderate risk/problem gamblers are, on average, spending 13 times as much as other gamblers (Table 4.2). If this calculation is further refined by making a comparison with the spending of gamblers who report no symptoms at all on the PGSI measure, then moderate risk and problem gamblers are spending, on average, 20 times the amount of problem-free gamblers. The group considered to be low-risk gamblers (PGSI scores of 1 or 2), who account for 28% of gambling revenue in the ACT are spending 11 times as much, on average, as gamblers who consider themselves as problem-free (Table 4.2). Clearly, they are spending less on average compared with the moderate risk and problem gambling group but they are spending substantially more than reported by those that are altogether free of gambling problems. This reinforces recent findings that so-called "low risk" gamblers are distinctly different to non-problem gamblers and are more similar to moderate risk gamblers (Currie *et al.*, 2013).

Estimates of PGES across all types of gambling combined will necessarily be closer to the values for specific forms of gambling that represent a bigger proportion of industry totals. EGMs account for a major share across Australian states and territories with the exception of WA. Our estimate for the PGES relating specifically to EGMs (41%) is similar to the estimate of 48% from the 2011 Tasmanian Survey (The Allen Consulting Group *et al.*, 2011) and indicates that it is the form of gambling in the ACT with the highest proportion of revenue derived from people who are identified with moderate risk or problem gambling. However, if the criterion of reporting any gambling-related problems is used (PGSI scores of one or more) then the combined group encompassing low-risk, moderate risk, and problem gambling accounts for over 70% of net expenditure on EGMs by the ACT adult population (Figure 4.1). Again, this is close to the comparable estimate from the 2011 Tasmanian Survey (The Allen Consulting Group *et al.*, 2011).

Other estimates of PGES were similar between the ACT and Tasmania, including for lottery (5% for both), scratch tickets (10% for both), horse and greyhound races (23% and 24% respectively). The estimate of PGES for sports betting was higher in the ACT than Tasmania (41% compared with 26%) whereas that for casino table games was lower in the ACT (20% compared with 35%). Generally, however, similar findings were obtained from the two jurisdictions.

Expenditure share for socioeconomic and demographic groups

We have not identified any previous attempts to estimate expenditure shares for demographic or socio-economic subgroups of the general population, so there are no direct points of comparison for the figures we derived for men (and women), younger and older people, people without partners, or low (and high) education groups. However, the findings are broadly what might be expected from what is known about levels of gambling participation and levels of problem gambling in different sections of the population. Most significantly, men, people without partners, and people with low education spend more than the population average on gambling. This is without making any form of adjustment for differences in income between these groups. The clearest examples of groups contributing relatively less to net gambling expenditure were, firstly, women (so men are obviously spending more) where buying scratch tickets was the only activity analysed where women spent as much (indeed slightly more) in total than men (Figure 5.1). The second example of lower net expenditure is seen in people with higher qualifications. Those with degree-level qualifications are consistently low spenders across all forms of gambling (Figure 5.4) and this is indicative of the regressivity of the consequent tax revenue. A third group with low net expenditure are those aged over 65. This applies to most activities but they are above average spenders on lotteries and scratch tickets (Figure 5.2). And, fourth, people with partners (either married or de facto) typically have lower net expenditure than single people; the only departure being for losses on lotteries (Figure 5.3).

Moving beyond the above generalisations, there are notable differences in patterns of socioeconomic and demographic expenditure shares across different gambling activities (Figures 5.1 to 5.4) and these patterns were described more fully in Chapter 5. Differences in net expenditure between men and women (Figure 5.1) reflect the greater levels of participation of men in particular types of betting. Patterns for different age groups should be interpreted cautiously, particularly in regard to whether the cross-sectional findings from a single survey in 2009 represent the gambling preferences of different birth cohorts (older people were obviously born long before younger people) or whether the findings reflect developmental age differences. If the latter is the case, then we would anticipate the younger age groups becoming more like their older counterparts if they were re-surveyed in the future. Alternatively, these younger groups could retain their patterns of expenditure into the future in which case the profile of ACT gambling losses would be very different in the future from the present profile.

Stepping back from the particular findings for specific socioeconomic and demographic groups, the broader canvas of results reinforces the anticipation in the introduction to this report that a disproportionate amount of gambling revenue comes from the poor, vulnerable and disadvantaged.

Comparison between self-reported expenditure and industry data

Not all types of gambling could be compared directly between the ACT Survey self-reports and AGS industry-reported figures. Where these were most comparable, instances were found where the ACT Survey data yielded higher estimates of net expenditure for the ACT and other instances yielded lower estimates (Table 7.1). It is possible that over- and under-reporting contributed to these differences but there are other sources of variability to consider. It could also be that some part of the low estimation of net EGM and casino table game expenditure in the 2009 prevalence survey is a consequence of people who play these activities being less likely to participate in the survey. Another source of variation is that the survey records losses by ACT residents regardless of where their gambling takes place whereas the industry data include net expenditure by non-residents. For example, some part of the higher level of spending on Keno estimated from the survey data may include spending that occurred in other jurisdictions.

Nevertheless, the losses reported both for EGMs and casino table games in the survey are substantially less that the industry data and it is highly likely (given similar findings from other studies) that many individuals under-report their spending on these activities. This is the primary justification for utilising the method of compensation when estimating PGES (and other shares for socioeconomic and demographic groups) for total net gambling expenditure. This technique, similar to the approach adopted by The Productivity Commission (1999), does not (and cannot) deal with over-reporting or under-reporting by individuals. What it does is to adjust the relative importance of different gambling activities when estimating PGES across all activities.

8.2 Limitations and strengths

Limitations

There are a number of limitations that should be considered when assessing and interpreting the findings of the present study. First, the survey was conducted in a confined geographical region with a particular demographic profile (atypical even for Australia), at a particular point in time with a specific range of available gambling products, so the results may not generalise to other locations and contexts. That said, the similarity of most of

the findings on PGES to earlier analyses reported for Tasmania (The Allen Consulting Group *et al.*, 2011) suggest that there is some degree of consistency of results across time and location.

A second limitation applies to the nature of the data collected in the 2009 Prevalence Survey, including the likely under-reporting (and over-reporting) of net expenditure, especially on certain activities. Our response to this has been to compensate the survey data so that the mix of activities representing overall gambling expenditure better reflects the known mix of revenue as reported in AGS industry data. At the same time, we acknowledge that it is impossible to compensate the survey data for potential biases in self-reported expenditure at the individual level. Our best guess would be that people with gambling problems are likely to under-report their spending more than other gamblers, but even this generalisation (however plausible) is difficult to establish and quantify. So, our estimates of PGES may be under-estimates but they are unlikely to be over-estimates. There is even less evidence on which to make judgements about our estimates of other gambling shares based on socioeconomic and demographic characteristics. The robustness of the reported findings will be shown by replication in other studies, especially studies that employ different methodologies.

A third limitation is that all analyses are constrained by sample size and statistical power. We have focussed on the six particular gambling activities that represented greater spending in the ACT (and were similarly more prevalent forms of betting) as well as overall net gambling expenditure across all activities. Even with this restricted set of activities, there are instances where other limitations impact on the reliability of findings. For example, the expenditure shares for problem gamblers with a PGSI score of 8 or more cannot be estimated with precision because of their small number in the survey. For that reason, we have utilised other thresholds to define gambling problems, including the commonly used level of a PGSI score of 3 or more. There are other instances where limitations of statistical power apply to our analyses, especially where participation in a particular gambling activity is uncommon for a particular demographic group. This does, of course, imply that their aggregate expenditure must be low but it also indicates uncertainty of the estimates obtained.

Strengths

The most obvious strength of the present study was the attempt to conduct the analyses in different ways in order to see whether the findings would be significantly changed by the variety of approaches. This applied to the technique of using Winsorised values for net expenditure, where extreme values (large wins and losses) are capped. The approach removes the impact that reports of atypical or unusual net expenditure may have on population means and totals. For the large majority of the analyses conducted, the use of capped and uncapped data made no appreciable difference to the substantive findings. The strategy also applied to the technique of compensating for potential under-reporting of particular types of expenditure (EGMs and casino table games). Again, the consequence of using two different ways of deriving estimates of gambling shares showed the findings to be remarkably robust given the magnitude of the compensation factors employed. Where there was some change, it was in the anticipated direction that problem gambling expenditure shares were somewhat increased by use of compensation. This is an inevitable outcome when it is already known that PGES is higher for EGMs and for casino table games than it is for most other gambling activities.

8.3 Conclusions

The conclusions and implications of the present study fall under three main headings of substantive findings, methodological developments, and future research priorities.

Substantive findings

The overriding and fundamental conclusion of the study is that gambling revenue is not drawn evenly from different groups in the community. Different types of people contribute very different amounts. The diversity is not trivial and sometimes it is huge. Some of these differences, relating to the characteristics of individual gamblers, raise issues of appropriateness and fairness, given that patterns of expenditure do not correspond to any obvious indicators of affordability or obligation to the community. The greater amount spent on gambling by people with the least education is striking. People without either Year 12 education or post-school qualifications spend more than four times the average seen for those with degree qualifications. The differences are even greater for some particular types of gambling, increasing to seven-fold for losses on EGMs. This form of gambling shows the greatest proportion of revenue being derived from the least educated section of the community.

The greatest differentials apply to symptoms of problem gambling and are most prominent for particular types of gambling, notably betting on EGMs, sports and special events, horse and greyhound races and casino table games. When the losses of gamblers labelled as “low-risk” are included along with the losses attributable to those with moderate-risk and problem gambling, then the majority of net expenditure on the four activities listed is derived from people with some level of gambling problem, even though they constitute less than 8% of all gamblers in the population.

Methodological developments

The collection of self-report data on gambling expenditure is feasible and, whilst the appropriate analysis of these data presents significant challenges, valuable results can be obtained. The reliability of the findings and their interpretation rests on the adoption of multiple approaches to analysis. Gambling expenditure data have been under-collected and under-utilised because of expressed fears about the underreporting of expenditure at the individual level. However, this circumstance is no different from many fields of research, including expenditure on other areas of personal or household budgets, or from comparable investigations of risks to health and wellbeing such as alcohol consumption, where underreporting is commonplace. The point is that valuable findings can be obtained, using appropriate techniques, in spite of evident underreporting at the individual level. Monetary expenditure is fundamental to gambling in all its forms and its place in gambling research is a necessity, however challenging.

Future research

It is important that the findings in this report are replicated in other studies, including surveys conducted in other parts of Australia and in jurisdictions with a different mix of available gambling products. There is also a need to refine the methodology employed in such studies and this would require different types of data collection to help identify weaknesses in existing survey methodology and help develop better measures of expenditure for use across a range of settings. Such measures could be used as replacements for existing survey questionnaire items or they could supplement existing items in ways that might allow validation, adjustment or inclusion of sensitivity analyses. The continuous development of measures is fundamental to healthy progress across many fields of research. A trend in gambling research, most notable in Australia, has been to minimise the collection and use of self-report data on expenditure. Reversing this trend is essential.

Chapter 9: References

Abbott, M. W. & Volberg, R., A, (2000). Taking the Pulse on Gambling and Problem Gambling in New Zealand: A Report on Phase One of the 1999 National Prevalence Survey. Department of Internal Affairs: Wellington.

ACIL Allen Consulting, the social research centre and the problem gambling research and treatment centre (2014). Third Social and Economic Impact Study of Gambling in Tasmania: Volume 2, 2013 Tasmanian Gambling Prevalence Survey. Melbourne.

Adbdel-Ghany, M. & Sharpe, D. L. (2001). Lottery expenditures in Canada: regional analysis of probability of purchase, amount of purchase, and incidence. *Family & Consumer Sciences* 30, 64-78.

American Psychiatric Association (2013). *Diagnostic and Statistical Manual of Mental Disorders.* American Psychiatric Publishing: Arlington, VA.

Australian Bureau of Statistics (1999). Regional Statistics, (cat. no. 1313.8). Retrieved from: http://www.abs.gov.au.

Australian Bureau of Statistics (2010). Population by Age and Sex, Australian States and Territories, (cat. no. 3201.0). Retrieved from: http://www.abs.gov.au.

Australian Gambling Statistics, 30th edition (2014). Queensland Government Statistician's Office, Queensland Treasury and Trade: Queensland.

Australian Gambling Statistics, 31st edition (2015). Queensland Government Statistician's Office, Queensland Treasury and Trade: Queensland.

Baseline Market Research Ltd (1996). Final report: 1996 prevalence study on problem gambling in Nova Scotia. Baseline Market Research: Halifax, Nova Scotia.

Blaszczynski, A., Dumlao, V. & Lange, M. (1997). "How much do you spend gambling?" Ambiguities in survey questionnaire items. *Journal of Gambling Studies* 13, 237-52.

Currie, S. R., Hodgins, D. C. & Casey, D. M. (2013). Validity of the problem gambling severity index interpretive categories. *Journal of Gambling Studies* 29, 311-327.

Davidson, T. & Rodgers, B. (2010). 2009 Survey of the nature and extent of gambling, and problem gambling, in the Australian Capital Territory: Final Report. ACT Gambling and Racing Commission: Canberra.

Davison, A. C. & Hinkley, D. V. (1997). *Bootstrap Methods and Their Applications*. Cambridge University Press: Cambridge.

Desai, R., Maciejewski, P., Dausey, D., Caldarone, B. & Potenza, M. (2004). Health correlates of recreational gambling in older adults. *The American Journal of Psychiatry* 161, 1672-1679.

Ferris, J. & Wynne, H. (2001). The Canadian Problem Gambling Index: Final Report. Canadian Centre on Substance Abuse (CCSA): Ontario.

Forrest, D. & Gulley, D. O. (2009). Participation and level of play in the UK National Lottery and correlation with spending on other modes of gambling. *International Gambling Studies* 9, 165-178.

Gemini Research and Angus Reid Group (1994). Social gaming and problem gambling in British Columbia: report to the British Columbia Lottery Corporation.

Gerstein, D., Hoffman, J., Larison, C., Engelman, L., Murphy, S., Palmer, A. & Volberg, R. (1999). Gambling Impact and Behavior Study. National Gambling Impact Study Commission: Chicago.

Hing, N., Gainsbury, S., Blaszczynski, A., Wood, R., Lubman, D. I. & Russell, A. (2014). Interactive Gambling. Office of Liquor, Gaming and Racing and Department of Justice, Victoria: Victoria.

Lesieur, H. R. (1998). Costs and treatment of pathological gambling. *Annals of the American Academy of Political and Social Science* 556, 153-171.

MacDonald, M., McMullan, J. L. & Perrier, D. C. (2004). Gambling households in Canada. *Journal of Gambling Studies* 20, 187-236.

Morasco, B. J. & Petry, N. M. (2006). Gambling problems and health functioning in individuals receiving disability. *Disability and Rehabilitation* 30, 619-623.

Ogilvy Illumination (2012). Prevalence of Gambling and Problem Gambling in New South Wales. NSW Office of Liquor, Gaming and Racing: Sydney.

Orford, J., Griffiths, M. & Wardle, H. (2013). What proportion of gambling is problem gambling? Estimates from the 2010 British Gambling Prevalence Survey. *International Gambling Studies* 13, 4-18.

Perez, L. & Humphreys, B. R. (2011). Lottery Participants and Revenues: An International Survey of Economic Research on Lotteries. University of Alberta Faculty of Arts Department of Economics:

Pietrzak, R. H., Morasco, B. J., Blanco, C., Grant, B. F. & Petry, N. M. (2007). Gambling level and psychiatric and medical disorders in older adults: Results from the National Epidemiologic Survey on Alcohol and Related Conditions. *The American Journal of Geriatric Psychiatry* 15, 301-313.

Productivity Commission (1999). Australia's Gambling Industry: Inquiry Report. AusInfo: Canberra.

Productivity Commission (2010). Gambling: Productivity Commission Inquiry Report No. 50. Productivity Commission: Canberra.

The ACT Gambling and Racing Commission (2001). Survey of the Nature and Extent of Gambling and Problem Gambling in the ACT. The ACT Gambling and Racing Commission: Canberra.

The Allen Consulting Group, Problem Gambling Research and Treatment Centre & the Social Research Centre (2011). Social and Economic Impact Study of Gambling in Tasmania, Volume 2: Gambling Survey. Tasmanian Department of Treasury and Finance: Melbourne.

Volberg, R. (1995). Wagering and problem gambling in Louisiana. Louisiana Economic Development and Gaming Corporation: New Orleans.

Volberg, R., Moore, L., Christiansen, E., Cummings, W. & Banks, S. (1998). Unaffordable losses: Estimating the proportion of gambling revenues dervied from problem gamblers. *Gaming Law Review* 2, 349-360.

Volberg, R. & Wray, I. (2007). Legal gambling and problem gambling as mechanisms of social domination: Some considerations for future research. *American Behavioral Scientist* 51, 56-85.

Volberg, R. A. (1993). Gambling and problem gambling among adolescents in Washington state. Albany, NY.

Volberg, R. A., Gerstein, D. R., Christiansen, E. M. & Baldridge, J. (2001). Assessing self-reported expenditures on gambling. *Managerial and Decision Economics* 22, 77-96.

Wallisch, L. (1996). Gambling in Texas: 1995 Surveys of Adult and Adolescent Gambling Behavior. Texas Commission on Alcohol and Drug Abuse: Austin, TX.

Welte, J. W., Barnes, G. M., Wieczorek, W. F., Tidwell, M. C. & Parker, J. (2002). Gambling participation in the U.S. -- results from a national survey. *Journal of Gambling Studies* 18, 313-337.

Williams, R. & Volberg, R. (2013). Gambling and Problem Gambling in Ontario. The Ontario Problem Gambling Research Centre & The Ontario Ministry of Health and Long Term Care:

Williams, R. J., Lee, C. K. & Back, K. J. (2013). The prevalence and nature of gambling and problem gambling in South Korea. *Social Psychiatry and Psychiatric Epidemiology* 48, 821-834.

Williams, R. J. & Wood, R. T. (2004). The proportion of gaming revenue derived from problem gamblers: Examining the issues in a Canadian context. *Analyses of Social Issues and Public Policy* 4, 33-45.

Wood, R. T. & Williams, R. J. (2007). 'How much money do you spend on gambling?' The comparative validity of question wordings used to assess gambling expenditure. *International Journal of Social Research Methodology* 10, 63-77.

Worthington, A., Brown, K., Crawford, M. & Pickernell, D. (2007). Gambling participation in Australia: Findings from the national household expenditure survey. *Review of Economics of the Household* 5, 209-221.

Worthington, A. C. (2001). Implicit finance in gambling expenditures: Australian evidence on socioeconomic and demographic tax incidence. *Public Finance Review* 29, 326-342.

Wynne Resources Ltd (1994). Gambling and problem gambling in Alberta. Wynne Resources: Edmonton, Alberta.

Young, M., Abu-Duhou, I., Barnes, T., Creed, E., Morris, M., Stevens, M. & Tyler, B. (2006). Northern Territory Gambling Prevalence Survey 2005. School for Social and Policy Research: Darwin.

Chapter 10: Appendices

10.0 Missing data analysis

Table 10.1: Valid responses and missing data amongst people with valid gambling frequency data (n=2074) across the measures used in the report.

Measure	N valid responses	N missing data	% missing
Socioeconomic and demographic measures			
Sex	2074	0	0.00
Age	2064	10	0.48
Current partner status	2066	8	0.39
Highest completed qualification	2068	6	0.29
All above socioeconomic and demographic measures	2053	21	1.01
Gambling measures			
PGSI	2073	1	0.05
Expenditure on:			
Lottery	2061	13	0.63
EGMs	2061	13	0.63
Horse or greyhound races	2072	2	0.10
Scratch tickets	2068	6	0.29
Table games at a casino	2072	2	0.10
Sports betting	2070	4	0.19
Total expenditure	2030	44	2.12
All above measures	2008	66	3.18

For each of the measures in Table 10.2, 44 participants were missing data on total expenditure. The n reflects a list-wise analysis of each measure against a dichotomous measure identifying people missing data on total expenditure. The percentages are weighted and the p-value was estimated using a chi-square analysis (weighted). Non-gamblers were excluded from this analysis because they cannot be missing data on expenditure.

Table 10.2: The proportion of gamblers with missing data on total expenditure by socioeconomic, demographic and gambling measures.

Measure	Unweighted n	Weighted %	P-value
Sex, n=1201			
Women	16	1.48	.099
Men	28	2.71	
Age, n=1198			
18-24	3	0.93	.069
25-44	12	2.10	
45-64	15	1.85	
65+	14	4.48	
Married or de facto, n=1198			
No	21	2.18	.886
Yes	23	2.07	
Highest completed qualification, n=1197			
< Year 12	12	3.82	.370
Year 12	9	1.69	
Trade certificate or diploma	12	2.15	
Bachelor degree or higher	11	1.87	
PGSI, n=1200			
Non-problem	33	1.81	<0.001
Low-risk	6	3.31	
Moderate risk	5	12.83	
Problem	0	0.00	
Frequency of gambling in the last 12 months (all activities), n=1201			
1-11	4	0.53	<.001
12-47	5	1.88	
48+	35	5.17	

10.1 Capped net expenditure by type of activity

Table 10.3: Net expenditure by type of activity in the ACT using capped measures.

Activity	Participation†	Expenditure shares (95% CIs)	Mean losses	ACT population losses
Lottery	46.1%	24.4% (20.4-29.8%)	$117	$31,987,440
EGMs	30.2%	35.1% (29.4-41.7%)	$168	$45,969,869
Horse and greyhound races	24.5%	21.3% (13.0-27.8%)	$102	$27,977,263
Scratch tickets	22.8%	3.0% (2.4-3.7%)	$14	$3,888,248
Table games at a casino	8.3%	4.9% (2.8-7.4%)	$23	$6,383,084
Sports and special events	7.9%	7.1% (4.2-10.2%)	$34	$9,252,952
Keno	5.8%	2.1% (1.2-3.1%)	$10	$2,705,985
Other activities*	10.8%	2.2% (-5.1-6.9%)	$11	$2,882,632
Sum across activities	69.8%	-	-	-

†Source: The 2009 ACT Survey (Davidson & Rodgers, 2010, p19).
*Other activities include bingo, private games like cards for money, casino type games on the internet and two-up.

10.2 Capped problem gambling expenditure shares

Table 10.4: Capped net expenditure (in dollars) on all activities in the last 12 months by level of problem gambling.

PGSI category	N ACT population	Proportion adult population	Proportion of gamblers	Expenditure shares (95% CIs)	Mean losses[a] (p-value[b])	ACT population losses
Non-gambler	88,894	32.4%	-	-	-	-
Non-problem	170,769	62.3%	92.1%	46.8% (38.8-55.9%)	$359[r]	$61,376,780
Low risk	9,338	3.4%	5.1%	26.7% (19.6-36.0%)	$3,748 (<.001)	$34,999,070
Moderate risk	3,664	1.3%	2.1%	17.6% (12.4-24.4%)	$6,295 (<.001)	$23,065,332
Problem	1,320	0.5%	0.7%	8.9% (6.8-12.3%)	$8,793 (<.001)	$11,606,290

a. Overall significance: differences between means across PGSI categories excluding non-gamblers (p<.001, df=3).
b. Significance of differences between means using paired contrasts.
r. Reference group mean.

Table 10.5: Capped net expenditure (in dollars) on lottery in the last 12 months by level of problem gambling.

PGSI category	N ACT population	Proportion adult population	Proportion of gamblers	Expenditure shares (95% CIs)	Mean losses [a] p-value [b]	ACT population losses
Non-gambler	88,894	32.4%	-	-	-	-
Non-problem	170,769	62.3%	92.1%	88.9% (81.9-96.8%)	$167[r]	$28,437,994
Low risk	9,338	3.4%	5.1%	6.6% (4.7-8.8%)	$228 (.150)	$2,125,872
Moderate risk	3,664	1.3%	2.1%	2.6% (1.6-4.0%)	$231 (.321)	$845,626
Problem	1,320	0.5%	0.7%	1.8% (0.7-3.2%)	$438 (.067)	$577,948

a. Overall significance: differences between means across PGSI categories excluding non-gamblers (p=.060, df=3).
b. Significance of differences between means using paired contrasts.
r. Reference group mean.

Table 10.6: Capped bet expenditure (in dollars) on EGMs in the last 12 months by level of problem gambling.

PGSI category	N ACT population	Proportion adult population	Proportion of gamblers	Expenditure shares (95% CIs)	Mean losses [a] (p-value [b])	ACT population losses
Non-gambler	88,894	32.4%	-	-	-	-
Non-problem	170,769	62.3%	92.1%	29.4% (23.2-37.1%)	$79[r]	$13,517,175
Low risk	9,338	3.4%	5.1%	29.4% (21.4-39.0%)	$1,445 (<.001)	$13,497,444
Moderate risk	3,664	1.3%	2.1%	23.0% (16.8-31.8%)	$2,888 (<.001)	$10,580,402
Problem	1,320	0.5%	0.7%	18.2% (14.0-25.2%)	$6,345 (<.001)	$8,374,848

a. Overall significance: differences between means across categories (p<.001, df=3).
b. Significance of differences between means using paired contrasts.
r. Reference group mean.

Table 10.7: Capped net expenditure (in dollars) on horse or greyhound races in the last 12 months by level of problem gambling.

PGSI category	N ACT population	Proportion adult population	Proportion of gamblers	Expenditure shares (95% CIs)	Mean losses[a] p-value[b]	ACT population losses
Non-gambler	88,894	32.4%	-	-	-	-
Non-problem	170,769	62.3%	92.1%	33.6% (16.3-55.9%)	$55[r]	$9,388,100
Low risk	9,338	3.4%	5.1%	44.7% (25.6-79.1%)	$1,339 (<.001)	$12,507,794
Moderate risk	3,664	1.3%	2.1%	17.8% (6.9-35.8%)	$1,356 (<.001)	$4,968,869
Problem	1,320	0.5%	0.7%	4.0% (0.3-10.8%)	$843 (.050)	$1,112,499

a. Overall significance: differences between means across categories (p<.001, df=3).
b. Significance of differences between means using paired contrasts.
r. Reference group mean.

Table 10.8: Capped net expenditure (in dollars) on scratch tickets in the last 12 months by level of problem gambling.

PGSI category	N ACT population	Proportion adult population	Proportion of gamblers	Expenditure shares (95% CIs)	Mean losses[a] (p-value[b])	ACT population losses
Non-gambler	88,894	32.4%	-	-	-	-
Non-problem	170,769	62.3%	92.1%	82.7% (72.5-93.8%)	$19[r]	$3,215,575
Low risk	9,338	3.4%	5.1%	7.7% (5.0-11.1%)	$32 (.061)	$300,987
Moderate risk	3,664	1.3%	2.1%	6.5% (3.7-10.4%)	$69 (.002)	$254,632
Problem	1,320	0.5%	0.7%	3.0% (0.4-6.8%)	$89 (.740)	$117,054

a. Overall significance: differences between means across categories (p=.002, df=3).
b. Significance of differences between means using paired contrasts.
r. Reference group mean.

Table 10.9: Capped net expenditure (in dollars) on table games at a casino in the last 12 months by level of problem gambling.

PGSI category	N ACT population	Proportion adult population	Proportion of gamblers	Expenditure shares (95% CIs)	Mean losses[a] (p-value[b])	ACT population losses
Non-gambler	88,894	32.4%	-	-	-	-
Non-problem	170,769	62.3%	92.1%	35.1% (14.9-62.5%)	$13[r]	$2,237,512
Low-risk	9,338	3.4%	5.1%	44.1% (19.9-76.4%)	$302 (<.001)	$2,816,933
Moderate risk	3,664	1.3%	2.1%	19.6% (6.0-40.0%)	$342 (.002)	$1,252,772
Problem	1,320	0.5%	0.7%	1.2% (0.0-3.7%)	$57 (.740)	$75,867

a. Overall significance: differences between means across categories (p<.001, df=3).
b. Significance of differences between means using paired contrasts.
r. Reference group mean.

10.3 Capped socioeconomic and demographic expenditure shares

Table 10.10: Capped net expenditure (in dollars) on all activities in the last 12 months by socioeconomic and demographic characteristics.

Measure	N ACT population	Proportion adult population	Expenditure shares (95% CIs)	Mean losses[a] (p-value[b])	ACT population losses
Sex					
Women	140,078	51.1%	27.6% (22.5-33.8%)	$258[r]	$36,118,414
Men	133,907	48.9%	72.4% (63.1-82.8%)	$709 (<.001)	$94,929,058
Age					
18-24	44,848	16.4%	14.1% (8.7-19.5%)	$411 (.435)	$18,419,851
25-44	96,349	35.2%	41.5% (32.9-50.7%)	$565 (.537)	$54,427,159
45-64	95,432	34.8%	36.3% (30.1-44.5%)	$499[r]	$47,612,302
65+	37,357	13.6%	8.1% (4.4-12.8%)	$283 (.036)	$10,588,160
Married or de facto					
No	105,570	38.5%	49.0% (40.7-58.4%)	$608 (.022)	$64,227,753
Yes	168,415	61.5%	51.0% (42.5-60.6%)	$397[r]	$66,819,719
Highest completed qualification					
< Year 12	28,364	10.4%	19.5% (14.7-25.3%)	$902 (<.001)	$25,594,531
Year 12	71,728	26.2%	38.6% (30.6-47.5%)	$705 (<.001)	$50,567,906
Trade certificate or diploma	50,152	18.3%	23.6% (18.2-29.9%)	$617 (<.001)	$30,925,640
Bachelor degree or higher	123,741	45.2%	18.3% (12.4-25.1%)	$194[r]	$23,959,396

a. Overall significance: differences between means across socioeconomic and demographic measures including non-gamblers (age p=.213, df=3; highest completed qualification p<.001, df=3).
b. Significance of difference between the mean and the reference group mean.
r. Reference group mean.

Table 10.11: Capped net expenditure (in dollars) on lottery in the last 12 months by socioeconomic and demographic characteristics.

Measure	N ACT population	Proportion adult population	Expenditure shares (95% CIs)	Mean losses[a] (p-value[b])	ACT population losses
Sex					
Women	140,078	51.1%	40.9% (35.9-46.6%)	$93 (<.001)	$13,093,380
Men	133,907	48.9%	59.1% (53.1-65.6%)	$141[r]	$18,894,061
Age					
18-24	44,848	16.4%	2.4% (1.0-3.5%)	$17 (<.001)	$768,389
25-44	96,349	35.2%	29.0% (24.4-33.8%)	$96 (<.001)	$9,273,671
45-64	95,432	34.8%	53.1% (47.2-59.4%)	$178[r]	$16,977,922
65+	37,357	13.6%	15.5% (12.4-18.7%)	$133 (.046)	$4,967,459
Married or de facto					
No	105,570	38.5%	28.4% (23.9-33.1%)	$86 (<.001)	$9,094,090
Yes	168,415	61.5%	71.6% (65.1-78.7%)	$136[r]	$22,893,350
Highest completed qualification					
< Year 12	28,364	10.4%	17.9% (14.3-21.5%)	$202 (<.001)	$5,724,609
Year 12	71,728	26.2%	26.2% (21.9-30.8%)	$117 (.019)	$8,388,916
Trade certificate or diploma	50,152	18.3%	24.6% (20.3-29.0%)	$157 (<.001)	$7,862,744
Bachelor degree or higher	123,741	45.2%	31.3% (26.9-36.1%)	$81[r]	$10,011,171

a. Overall significance: differences between means across socioeconomic and demographic measures including non-gamblers (age p<.001, df=3; highest completed qualification p<.001, df=3).
b. Significance of difference between the mean and the reference group mean.
r. Reference group mean.

Table 10.12: Capped net expenditure (in dollars) on EGMs in the last 12 months by socioeconomic and demographic characteristics.

Measure	N ACT population	Proportion adult population	Expenditure shares (95% CIs)	Mean losses[a] (p-value[b])	ACT population losses
Sex					
Women	140,078	51.1%	34.8% (26.0-44.0%)	$114 (.002)	$15,315,292
Men	133,907	48.9%	65.2% (54.5-77.7%)	$224[r]	$30,170,049
Age					
18-24	44,848	16.4%	13.5% (8.8-18.7%)	$138 (.365)	$6,192,738
25-44	96,349	35.2%	39.4% (29.2-49.6%)	$188 (.789)	$18,093,176
45-64	95,432	34.8%	36.3% (28.4-45.2%)	$175[r]	$16,681,155
65+	37,357	13.6%	10.9% (7.3-15.0%)	$134 (.266)	$5,002,800
Married or de facto					
No	105,570	38.5%	52.4% (42.3-63.6%)	$228 (.009)	$24,073,620
Yes	168,415	61.5%	47.6% (38.8-58.4%)	$130[r]	$21,896,248
Highest completed qualification					
< Year 12	28,364	10.4%	25.6% (17.9-34.0%)	$415 (<.001)	$11,758,847
Year 12	71,728	26.2%	35.6% (27.1-45.0%)	$228 (<.001)	$16,377,993
Trade certificate or diploma	50,152	18.3%	23.1% (15.4-31.0%)	$212 (<.001)	$10,619,454
Bachelor degree or higher	123,741	45.2%	15.7% (11.2-20.8%)	$58[r]	$7,213,575

a. Overall significance: differences between means across socioeconomic and demographic measures including non-gamblers (age p=.680, df=3; highest completed qualification p<.001, df=3).
b. Significance of difference between the mean and the reference group mean.
r. Reference group mean.

Table 10.13: Capped net expenditure (in dollars) on horse or greyhound races in the last 12 months by socioeconomic and demographic characteristics.

Measure	N ACT population	Proportion adult population	Expenditure shares (95% CIs)	Mean losses[a] (p-value[b])	ACT population losses
Sex					
Women	140,078	51.1%	9.6% (5.2-18.1%)	$19 (.001)	$2,679,482
Men	133,907	48.9%	90.4% (67.9-134.7%)	$189[r]	$25,297,781
Age					
18-24	44,848	16.4%	14.9% (5.1-29.4%)	$93 (.842)	$4,174,961
25-44	96,349	35.2%	60.6% (40.4-101.7%)	$176 (.028)	$16,950,730
45-64	95,432	34.8%	27.9% (18.2-50.7%)	$82[r]	$7,796,436
65+	37,357	13.6%	-3.4% (-23.7-13.5%)	$-25 .316)	$-944,863
Married or de facto					
No	105,570	38.5%	52.5% (33.0-89.7%)	$139 (.203)	$14,680,397
Yes	168,415	61.5%	47.5% (27.2-73.0%)	$79[r]	$13,296,867
Highest completed qualification					
< Year 12	28,364	10.4%	16.3% (8.0-32.0%)	$161 (.024)	$4,563,323
Year 12	71,728	26.2%	47.3% (28.7-82.3%)	$185 (.007)	$13,241,215
Trade certificate or diploma	50,152	18.3%	20.0% (8.4-39.0%)	$112 (.165)	$5,595,291
Bachelor degree or higher	123,741	45.2%	16.4% (-2.2-36.0%)	$37[r]	$4,577,435

a. Overall significance: differences between means across socioeconomic and demographic measures including non-gamblers (age p=.680, df=3; highest completed qualification p<.001, df=3).
b. Significance of difference between the mean and the reference group mean.
r. Reference group mean.

Table 10.14: Capped net expenditure (in dollars) on scratch tickets in the last 12 months by socioeconomic and demographic characteristics.

Measure	N ACT population	Proportion adult population	Expenditure shares (95% CIs)	Mean losses[a] (p-value[b])	Total ACT population losses
Sex					
Women	140,078	51.1%	53.2% (44.7-62.4%)	$15 (.651)	$2,066,798
Men	133,907	48.9%	46.8% (38.9-55.7%)	$14[r]	$1,821,450
Age					
18-24	44,848	16.4%	7.9% (4.9-11.0%)	$7 (<.001)	$306,704
25-44	96,349	35.2%	30.4% (23.4-37.8%)	$12 (.044)	$1,183,054
45-64	95,432	34.8%	44.7% (37.0-53.6%)	$18[r]	$1,738,995
65+	37,357	13.6%	17.0% (10.3-23.1%)	$18 (.875)	$659,495
Married or de facto					
No	105,570	38.5%	32.4% (25.7-39.7%)	$12 (.126)	$1,258,207
Yes	168,415	61.5%	67.6% (58.4-77.7%)	$16[r]	$2,630,040
Highest completed qualification					
< Year 12	28,364	10.4%	15.9% (10.7-21.3%)	$22 (.018)	$619,968
Year 12	71,728	26.2%	28.4% (21.3-35.4%)	$15 (.151)	$1,103,517
Trade certificate or diploma	50,152	18.3%	21.1% (16.0-26.5%)	$16 (.067)	$818,928
Bachelor degree or higher	123,741	45.2%	34.6% (27.3-42.4%)	$11[r]	$1,345,835

a. Overall significance: differences between means across socioeconomic and demographic measures including non-gamblers (age p=.012, df=3; highest completed qualification p=.052, df=3).
b. Significance of difference between the mean and the reference group mean.
r. Reference group mean.

Table 10.15: Capped net expenditure (in dollars) on table games at a casino in the last 12 months by socioeconomic and demographic characteristics.

Measure	N ACT population	Proportion adult population	Expenditure shares (95% CIs)	Mean losses[a] (p-value[b])	Total ACT population losses
Sex					
Women	140,078	51.1%	4.3% (1.5-9.2%)	$2 (<.001)	$271,547
Men	133,907	48.9%	95.7% (68.3-131.5%)	$46[r]	$6,111,537
Age					
18-24	44,848	16.4%	36.0% (18.3-66.0%)	$51 (.036)	$2,295,213
25-44	96,349	35.2%	47.9% (25.4-80.9%)	$32 (.164)	$3,059,927
45-64	95,432	34.8%	15.4% (-2.4-35.4%)	$10[r]	$985,078
65+	37,357	13.6%	0.7% (0.0-1.8%)	$1 (.539)	$42,866
Married or de facto					
No	105,570	38.5%	50.0% (28.8-85.1%)	$30 (.337)	$3,188,424
Yes	168,415	61.5%	50.0% (22.9-78.2%)	$19[r]	$3,194,660
Highest completed qualification					
< Year 12	28,364	10.4%	1.0% (0.3-2.3%)	$2 (.030)	$64,409
Year 12	71,728	26.2%	56.9% (31.8-90.1%)	$51 (.006)	$3,628,890
Trade certificate or diploma	50,152	18.3%	24.2% (5.4-47.1%)	$31 (.118)	$1,547,207
Bachelor degree or higher	123,741	45.2%	17.9% (7.6-35.1%)	$9[r]	$1,142,577

a. Overall significance: differences between means across socioeconomic and demographic measures including non-gamblers (age p=.012, df=3; highest completed qualification p=.052, df=3).
b. Significance of difference between the mean and the reference group mean.
r. Reference group mean.

10.4 Comparing industry and capped survey data

Table 10.16: Per capita and population net expenditure (in dollars) in the ACT by activity: derived from AGS industry data and the 2009 ACT Survey (capped).

Activity	AGS INDUSTRY DATA*		(B) ACT SURVEY DATA		Ratio of industry to survey data (A/B)
	Per capita expenditure	ACT population losses	Mean expenditure	ACT population losses	
Lottery	$70	$19,111,838	$117	$31,987,440	0.60
Scratch tickets	$7	$2,020,546	$14	$3,888,248	0.52
EGMs	$636	$174,298,529	$168	$45,969,869	3.79
Casino	$70	$19,307,725	$23	$6,383,084	3.02
Keno	$3	$926,256	$11	$2,894,973	0.32

*Source: Queensland Treasury and Trade, (2012)

Table 10.17: Uncapped net expenditure (in dollars) by type of activity using 2009 Survey data compensated to match AGS industry data†.

Activity	Proportion Participation	Proportion of total losses (95% CIs)	Mean losses	ACT population losses
Lottery	46.1%	11.7% (9.7-14.3%)	$118	$32,328,187
EGMs	30.2%	63.1% (56.3-70.1%)	$636	$174,298,213
Horse and greyhound races	24.5%	11.7% (6.9-16.4%)	$118	$32,335,704
Scratch tickets	22.8%	1.4% (1.1-1.8%)	$14	$3,906,322
Table games at a casino	8.3%	7.0% (3.8-10.7%)	$70	$19,307,690
Sports and special events	7.9%	3.4% (1.9-5.0%)	$34	$9,252,952
Keno	5.8%	1.0% (0.6-1.6%)	$11	$2,894,973
Other activities*	10.8%	0.7% (-3.3-3.2%)	$7	$1,807,248
Sum across activities	69.8%	-	$1008	$276,131,289

†Compensated so that net expenditure on EGMs and table games at a casino reflected industry data

Table 10.18: Capped net expenditure (in dollars) by type of activity using 2009 Survey data compensated to match AGS industry data†.

Activity	Proportion Participation	Proportion of total losses (95% CIs)	Mean losses	ACT population losses
Lottery	46.1%	11.7% (9.7-14.3%)	$117	$31,987,440
EGMs	30.2%	64.0% (57.9-70.3%)	$636	$174,298,212
Horse and greyhound races	24.5%	10.3% (5.9-14.1%)	$102	$27,977,263
Scratch tickets	22.8%	1.4% (1.1-1.8%)	$14	$3,888,248
Table games at a casino	8.3%	7.1% (4.1-10.7%)	$70	$19,307,690
Sports and special events	7.9%	3.4% (2.0-5.1%)	$34	$9,252,952
Keno	5.8%	1.0% (0.6-1.5%)	$10	$2,705,985
Other activities*	10.8%	1.1% (-2.4-3.4%)	$11	$2,882,632
Sum across activities	69.8%	-	$994	$272,300,421

†Compensated so that net expenditure on EGMs and table games at a casino reflected industry data

10.5 Capped problem gambling expenditure shares for all activities using compensated survey data

Table 10.19: Capped net expenditure (in dollars) on all activities compensated to match AGS industry data†, in the last 12 months by the PGSI.

PGSI category	n population	Proportion adult population	Expenditure shares (95% CIs)	Mean losses	ACT population losses
Non-gambler	88,894	32.4%	-	-	-
Non-problem	170,769	62.3%	38.1% (31.8-45.9%)	$607	$103,641,552
Low risk	9,338	3.4%	28.8% (22.0-37.7%)	$8,394	$78,381,986
Moderate risk	3,664	1.3%	20.2% (15.1-27.2%)	$15,049	$55,137,959
Problem	1,320	0.5%	12.9% (10.1-17.3%)	$26,620	$35,138,924

†Compensated so that net expenditure on EGMs and table games at a casino reflected industry data

10.6 Socioeconomic and demographic gambling expenditure shares for all activities using compensated and capped survey data

Table 10.20: Capped net expenditure (in dollars) on all activities in the last 12 months by socioeconomic characteristics using 2009 Survey data compensated to match industry data†.

Measure	n population	Proportion adult population	Expenditure shares (95% CIs)	Mean losses	ACT population losses
Sex					
Women	140,078	51.1%	29.9% (23.8-37.0%)	$580	$81,298,636
Men	133,907	48.9%	70.1% (61.1-80.2%)	$1,426	$191,001,786
Age					
18-24	44,848	16.4%	14.8% (10.3-19.7%)	$900	$40,354,741
25-44	96,349	35.2%	40.8% (32.5-49.3%)	$1,153	$111,131,427
45-64	95,432	34.8%	35.3% (29.2-42.6%)	$1,008	$96,173,606
65+	37,357	13.6%	9.0% (6.0-12.6%)	$660	$24,640,648
Married or de facto					
No	105,570	38.5%	50.6% (42.4-59.9%)	$1,306	$137,887,062
Yes	168,415	61.5%	49.4% (41.3-58.5%)	$798	$134,413,359
Highest completed qualification					
< Year 12	28,364	10.4%	21.5% (16.0-27.8%)	$2,064	$58,550,652
Year 12	71,728	26.2%	38.1% (30.3-46.2%)	$1,445	$103,636,161
Trade certificate or diploma	50,152	18.3%	23.4% (17.5-29.9%)	$1,270	$63,703,462
Bachelor degree or higher	123,741	45.2%	17.0% (12.7-21.9%)	$375	$46,410,147

†Compensated so that net expenditure on EGMs and table games at a casino reflected industry data

School of Sociology, ANU College of Arts and Social Sciences
sociology.cass.anu.edu.au/research/centre-gambling-research

ANU Centre for Gambling Research reports
www.gamblingandracing.act.gov.au/community/research