A STUDY OF GAMBLING IN VICTORIA

PROBLEM GAMBLING FROM A PUBLIC HEALTH PERSPECTIVE

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DEPARTMENT OF JUSTICE

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A Study of Gambling In Victoria - Problem Gambling from a Public Health Perspective

This research report - A study of gambling in Victoria - problem gambling from a public health perspective is Victoria's largest study on gambling and is underpinned by a public health philosophy and methodology. A representative sample of Victorians was surveyed using Computer Aided Telephone Interviewing (CATI). The findings from the survey enable us to describe the epidemiology of problem gambling in Victoria. The report examines not only the distribution of gambling behaviour in the State, but focuses on health and well-being issues of gamblers in an effort to understand the possible determinants of problem gambling.

All gamblers (all adults who had gambled in the past year) were asked nine questions that categorise gamblers into the following risk groups, based on their scored answers: problem gamblers, moderate risk gamblers, low risk gamblers and non-problem gamblers. The scale used is the Problem Gambling Severity Index (PGSI) within the Canadian Problem Gambling Index (CPGI) (refer glossary for terms).

Categorising gamblers into risk segments, enables the Victorian Government to plan prevention and early intervention strategies to reduce gambling-related harm and provides valuable information for planning effective treatment services. Gamblers are grouped according to these risk segments throughout the report.

The PGSI also enables an estimate of the prevalence of problem gambling to be calculated - in this case during the preceding 12-month period. Survey respondents were additionally administered the NODS-CLiP 2 (refer to glossary) which estimates the lifetime prevalence of both problem and pathological gambling (refer to glossary). Lifetime prevalence includes the total number of persons known to have had a disease or health condition (ie. problem gambling) for at least a part of their lives. This data is useful in understanding the pathways in to and out of problem gambling, which is critical to the public health aims of prevention and early intervention.

Respondents were asked a series of questions about their mental well-being in the study. These questions comprise the Kessler Psychological Distress Scale (K-10). This screen is widely used in Australia both at national and jurisdictional levels. The K-10 is based on 10 questions about negative emotional states experienced during the four week period leading up to the survey and categorises respondents into the following segments, based on their scoring: likely to be well, likely to have a mild disorder, likely to have a moderate mental disorder and likely to have a severe mental disorder.

Key questions were asked of gamblers about their health and well-being, including questions on their cigarette, alcohol and drug use. Respondents were asked four questions from the CAGE screen (refer to glossary), a screening tool for alcoholism and alcohol use disorders. This screen diagnoses alcohol problems over a lifetime and is one of the oldest and shortest screening instruments in use.

Screens and questions on co-morbidities (such as substance abuse and mental disorders) assist, not only in the planning of effective treatments for problem gamblers, but are crucial to prevention and early intervention strategies in problem gambling.

Questions on community connectedness were similarly included. This is consistent with a public health approach in that the study explores some of the social determinants of health and well-being.

A Study of Gambling in Victoria - Problem Gambling from a Public Health Perspective

August 2008 to October 2008

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for the Department of Justice, Victoria.

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Glossary

CAGE	A screening tool for alcoholism and alcohol use disorder. C - cut down on drinking- have tried repeatedly without success, A - annoyed by criticisms about drinking habits, G - Guilty feelings about drinking, and E - Eye opener drink needed in the morning.
CALD	Culturally and Linguistically Diverse Populations.
CATI	Computer Aided Telephone Interviews.
Confidence interval	The computed interval with a given probability (e.g. 95%) that the true value of a variable such as a mean, proportion, or rate is contained within the interval.
CPGI	Canadian Problem Gambling Index. This screen contains questions about gambling participation, behaviour, feelings, experiences and socio-demographic characteristics. Nine of these questions are scored to assess risk of gambling problems and are known as the Problem Gambling Severity Index (PGSI). (Ferris, J & Wynne, H. 2001, The Canadian Problem Gambling Index: user manual, Report to the Canadian Inter-Provincial Task Force on Problem Gambling, Ottawa, ON: Canadian Centre on Substance Abuse).
DSM-IV	Diagnostic and Statistical Manual of Mental Disorders Fourth edition, 1994 - American Psychiatric Association.
EGM	Abbreviation for Electronic Gaming Machines.
Epidemiology	The study of the distribution and determinants of health related states or events in specified populations, and the application of this study to the control of health problems (John M Last Dictionary of Epidemiology Oxford University Press, 1995).
Incidence	The number of new events, e.g. new cases, in a defined population (John M Last Dictionary of Epidemiology Oxford University Press, 1995).
K-10	Abbreviation for Kessler-10. The K-10 is a short measurement scale (containing ten questions) which measures general psychological distress.
LGA	Local Government Area.
LOTE	Language other than English.
NODS-CLiP2	The NODS-CLiP2 is a brief screen that measures lifetime prevalence of pathological gambling. The original 3-item NODS-CLiP was developed by Marianna Toce-Gerstein and Rachel Volberg. (Toce- Gerstein, M., & Volberg, R. A. (2003). The NODS-CLiP: A New Brief Screen for Pathological Gambling. Paper presented at the 17th National Conference on Problem Gambling. Louisville, KY. July 17- 19, 2003). The NODS-CLiP2, used in this study, is not published. It was developed by Rachel Volberg and Yoku Shaw Taylor.
OR	Abbreviation for odds ratio. Odds ratios are a method for comparing the odds of a certain event between two groups (e.g. problem gamblers and non-problem gamblers). An odds ratio of '1' implies that a result is equally likely in both groups. An odds ratio greater than '1' implies that the event is more likely in the second group, compared to the reference group. An odds ratio less than '1' implies that the result is less likely in the second group (compared to the reference group).

Prevalence	The number of events, e.g. instances of a given disease or other condition, in a given population at a designated time. When used without qualification, the term usually refers to the situation at a specified point in time (point prevalence). Note that this is a number not a rate. (John M Last Dictionary of Epidemiology Oxford University Press, 1995). Lifetime prevalence - The total number of persons known to have had the disease or attribute for at least part of their lives (John M Last Dictionary of Epidemiology Oxford University Press, 1995) (estimated by NODS-CLiP2 in this study).
p value	Probability value – see Statistical Significance.
Pathological gambling	A persistent and recurrent maladaptive gambling behaviour as indicated by five (or more) behaviours, listed in the DSM-IV, where the gambling behaviour cannot be accounted for by a manic episode (Source: Diagnostic and Statistical Manual of Mental Disorders Fourth edition, 1994 - American Psychiatric Association).
PGSI	Abbreviation for Problem Gambling Severity Index - 9 questions from the Canadian Problem Gambling Index, which measures risk for problem gambling.
Problem gambling	Problem gambling is characterised by difficulties in limiting money and/or time spent on gambling which leads to adverse consequences for the gambler, others, or for the community (Neal P, DelFabbro P, O'Neil M Problem gambling towards a national definition, 2005 Gambling Research Australia).
Readiness to Change Scale	A scale based on the Transtheoretical Model of behavioural change and developed by Rollnick, Heather, Gold and Hall (1992). The scale measures whether a gambler is in a precontemplation stage (not yet thinking about reducing their gambling), contemplation stage (actively thinking to reduce their gambling) or an action stage (already actively trying to reduce their gambling) of behavioural change.
Risk segment	The risk status allocated to gamblers who completed the survey as measured by the Problem Gambling Severity Index: non-problem gamblers score 0; low risk gamblers 1-2; moderate risk gamblers 3-7 and problem gamblers 8 or higher.
Standard error	The standard deviation of an estimate.
Statistical significance	Statistical methods which allow a test of the probability of two groups being the same or an association occurring between variable. A statistically significant result suggests that the theoretical chance of two groups being the same is very low probability. Usually the level of significance is stated by the p value. For instance, $p<.05$ indicates that the theoretical chance of two groups being the same is less than 5%.
Victorian Government Regions	All Victorian State Departments with a regional presence have adopted common regional boundaries. These are based upon those currently used by the Department of Human Services and align with local government areas. The result is eight standard administrative regions – five in provincial Victoria and three in metropolitan Melbourne.

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Executive summary

Overview

This report presents findings of a study of the epidemiology of problem gambling in Victoria. Epidemiology is the study of the distribution and determinants of health related states or events in specified populations, and the application of this study to control health problems. In this context, the current study investigated the prevalence and distribution of problem gambling in Victoria, along with the various factors associated with increased risk for problem gambling.

The current study takes a very different and perhaps unique approach to examining problem gambling in Victoria. Unlike past studies, this study examined gambling patterns in the community from a population health perspective. This involved *not only* measuring the prevalence of different forms of gambling, *but also* importantly, the health and well-being determinants of problem gambling. From this viewpoint, problem gambling is viewed as an important health and well-being issue for Victorians and similar to other health issues, is influenced by a diverse range of health, social and other determinants.

Largest study ever for Victoria

The current study is also the largest study ever of problem gambling in Victoria. A total of 15000 respondents were interviewed via Computer Aided Telephone Interviewing (CATI) to ensure high quality data for Victoria and its population health planning regions. For this reason, the sample was stratified across the eight Victorian Government regions. This sampling methodology was important to allow a solid foundation of knowledge to be developed about gambling for metropolitan and regional Victorian communities. Interviewing was conducted July-October 2008.

New perspectives on gambling

In the epidemiological study, a new approach was taken to defining 'gambling'. This included differentiating the measurement of gambling activities from the channels through which gambling activities are delivered (eg. pokies can be played through clubs, pubs or online). New activities measured included participation in event wagering (eg. wagering on the outcomes of TV shows), participation in SMS or phone-in competitions and participation in speculative stock investments (such as day-trading in stocks and shares). The survey instrument used in the study is presented in the Appendix.

Specific gambling activities measured in the study were:

- Informal private betting for money (like playing cards at home)
- Playing the pokies or electronic gaming machines (EGM)
- Betting on table games like blackjack, roulette and poker
- Betting on horse or harness racing or greyhounds - excluding sweeps
- Betting on sports and event results - like on football or TV show results
- Lotto, Powerball or the Pools
- Keno
- Scratch tickets
- Bingo
- Competitions where you pay money to enter by phone or leave an SMS
- Raffles, sweeps and other competitions
- Speculative stock investments like day trading (without a long term strategy)

Interesting design features of the study

The epidemiological study of problem gambling included many design features that had not been previously trialed in past prevalence studies. Notable design features of the study included:

- concentration of study sampling within high Electronic Gaming Machine (EGM) expenditure Local Government Areas (LGA) across Victorian Government regions
- use of random digit dialling to ensure improved coverage of households in Victoria (given that a current version of electronic Whitepages is no longer available on disk)
- screening of all past year gamblers for risk for problem gambling
- screening of all people who had ever gambled for risk for lifetime problem gambling
- use of a range of validated health measurement scales including use of the Kessler-10 (measurement of generalised psychological distress), the CAGE alcohol screen (measurement of clinically significant alcohol abuse), the Gambling Readiness to Change Scale (for measurement of readiness to reduce gambling) and measurement of a diverse range of health conditions and health behaviours (eg. general health, health conditions and disabilities, smoking, alcohol and drug use, suicide ideation, illegal activities etc.)

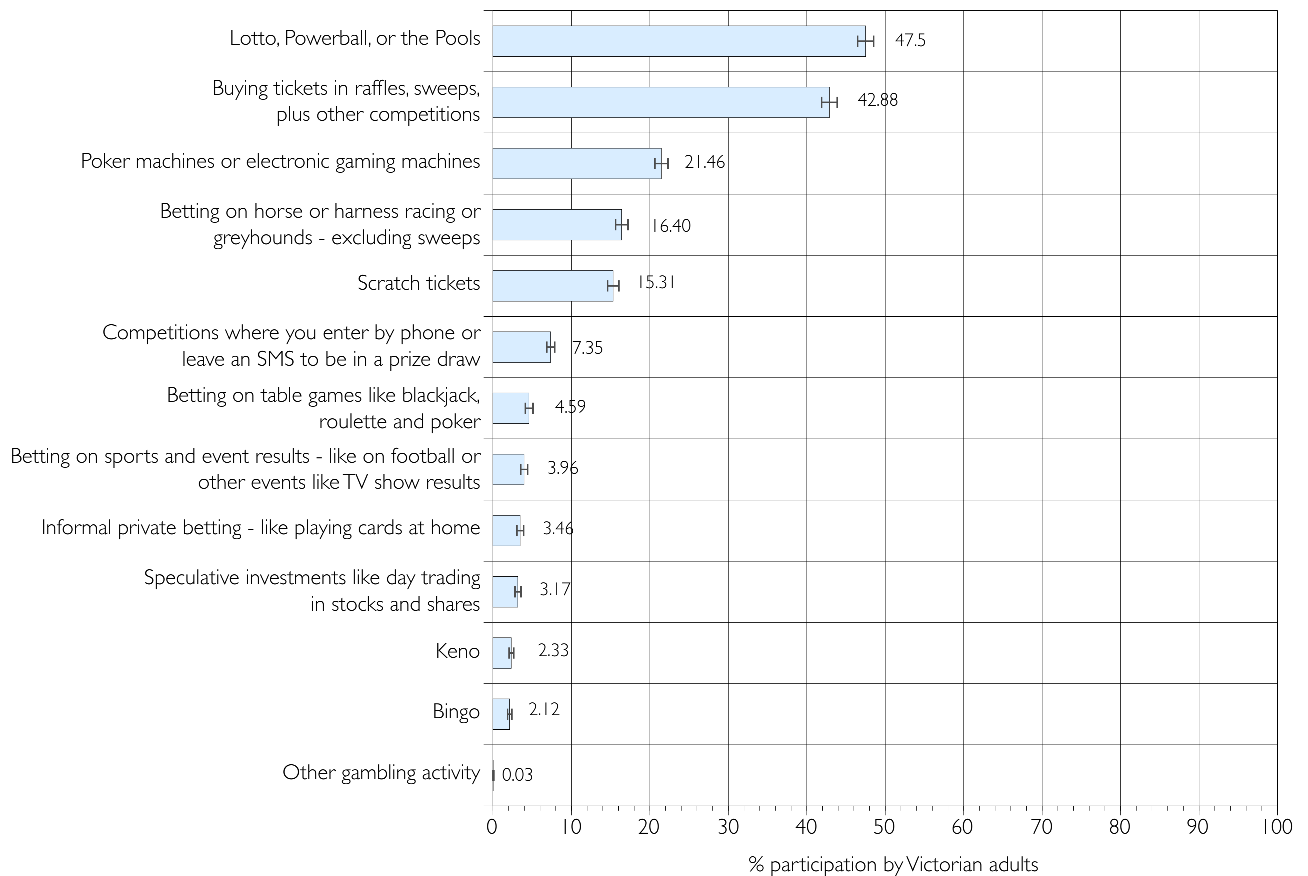
Major findings and insights from the epidemiological study

KEY FINDINGS RELATING TO MAJOR GAMBLING ACTIVITIES

Participation in gambling

In total, 73.07% of Victorian adults reported participating in some form of gambling in the past twelve months. Figure 1 presents the specific range of gambling activities played. This highlights that lotto/Powerball/Pools were most popular (47.5% of adults), follow by raffles/sweeps/competitions (42.88% of adults), poker or electronic gaming machines (21.46%), horse/harness/greyhound racing - excluding sweeps (16.40%) and scratch tickets (15.31%).

Figure 1. Participation in different gambling activities in Victoria in past year - All Victorian adults (July-October 2008 - N=15000)[a]



a. Question - On which of the following activities have you spent any money on in the past 12mths? (Base: All Victorian adults)

Prevalence of problem gambling

The prevalence of problem gambling in the Victorian adult population was measured through the nine-item Canadian Problem Gambling Severity Index (PGSI). In the epidemiological study, every adult gambler in the study was screened for risk for problem gambling (with gambling defined as participation in any activity listed).

Segmentation of the Victorian adult population in terms of risk for problem gambling (along with non-gambling) is presented in Table 1. Based on scores on the PGSI:

- 0.70% of Victorian adults are problem gamblers (lower CI=0.55, upper CI=0.90)
- 2.36% of Victorian adults are moderate risk gamblers (lower CI=2.06, upper CI=2.70)
- 5.70% of Victorian adults are low risk gamblers (lower CI=5.23, upper CI=6.21)
- 64.31% of Victorian adults are non-problem gamblers (lower CI=63.30, upper CI=65.31)
- 26.93% of Victorian adults are non-gamblers (lower CI=25.99, upper CI=27.88)

Table 1. Prevalence of problem gambling in Victorian adults by Canadian Problem Gambling Severity Index (N=15,000 - July-October 2008)[a]

Risk for problem gambling	% Victorian adults[b]			
	%	SE	Lower	Upper
Non-problem gamblers (score of 0)	64.31	0.51	63.30	65.31
Low risk gamblers (score of 1-2)	5.70	0.25	5.23	6.21
Moderate risk gamblers (score of 3-7)	2.36	0.16	2.06	2.70
Problem gamblers (score of 8-27)	0.70	0.09	0.55	0.90
Non-gamblers	26.93	0.48	25.99	27.88

a. Question - Based on Score on Canadian Problem Gambling Severity Index (Base: All Victorian adults)

b. SE denotes standard error, Lower/Upper denote lower and upper confidence limits

While sampling in the study covered the whole of Victoria, sampling was focused on higher EGM spend bands (ie. LGAs where average EGM expenditure for adults was higher). Consistent with the sampling frame design intent (ie. to focus sampling in locations where there is likely to be increased risk for problem gambling), findings revealed that the odds of problem gambling (as opposed to not being a problem gambler) was significantly higher in medium EGM spend bands (OR=16.10, p<.001) and high EGM spend bands (OR=15.54, p<.001), compared to lower EGM spend band regions.

Lifetime problem gambling

As part of the epidemiological study, lifetime risk for problem gambling was measured through use of the NODS-CLiP2 scale. This scale presents an efficient method for measuring an individual's lifetime risk for problem gambling. An estimated 1.13% of Victorian adults were classified as 'lifetime pathological gamblers', 1.18% were as 'lifetime problem gamblers' and 4.57% as 'lifetime at-risk problem gamblers'. In contrast, 93.12% were classified as 'lifetime non-problem gamblers' using the NODS-CLiP2 scale.

Segment profiles

A profile of gambling risk segments and non-gamblers, compared to the Victorian adult population, is illustrated in the following A4 figures. While gambling risk segments are largely compared with Australian Bureau of Statistics Census data (data is typically either from or based on the 2006 Census), segments are also compared with a small number of 'overall' results from the epidemiological study.

Within this context, it should be noted that PGSI risk segments form part of the overall Victorian adult population. This implies that risk segments are being compared with an overall group from which they are also part (so limitations of this comparison should naturally be considered).

Figure 2 also presents gambling activities by risk segment. Segment comparisons on specific gambling activities are summarised in Table 2.

Table 2. Significant trends comparing non-problem gamblers with other risk segments (odds ratios displayed as OR)

Comparison group	Compared to non-problem gamblers, gamblers in the segment to the left were significantly MORE LIKELY to:	Compared to non-problem gamblers, gamblers in the segment to the left were NO MORE LIKELY to[a]:
Low risk gamblers	• participate in informal private betting (OR=3.24, p<.001) • play pokies or electronic gaming machines (OR=3.67, p<.001) • play table games (OR=4.45. p<.001) • bet on horse/harness racing/greyhounds (OR=2.04, p<.001) • bet on sport and event results (OR=3.89, p<.001) • bet on keno (OR=2.35, p<.001) • play scratch tickets (OR=1.82, p<.001) • play bingo (OR=2.14, p<.001) • engage in speculative trading (OR=2.19, p<.01)	• play lotto/Powerball/Pools (ns) • participate in phone-in/ SMS competitions (ns)
Moderate risk gamblers	• participate in informal private betting (OR=5.50, p<.001) • play pokies or electronic gaming machines (OR=10.35, p<.001) • play table games (OR=6.86. p<.001) • bet on horse/harness racing/greyhounds (OR=2.58, p<.001) • bet on sport and event results (OR=4.88, p<.001) • bet on keno (OR=2.98, p<.001) • play lotto/Powerball/Pools (OR=1.47, p<.05) • play scratch tickets (OR=1.65, p<.01) • play bingo (OR=4.75, p<.001)	• participate in phone-in/ SMS competitions (ns) • engage in speculative trading (ns)
Problem gamblers	• play pokies or electronic gaming machines (OR=30.98, p<.001) • play table games (OR=7.16. p<.001) • bet on horse/harness racing/greyhounds (OR=1.95, p<.001) • bet on sport and event results (OR=4.36, p<.001) • bet on keno (OR=4.52, p<.001) • play lotto/Powerball/Pools (OR=1.73, p<.05) • play scratch tickets (OR=2.30, p<.01) • play bingo (OR=4.13, p<.001)	• participate in informal private betting (ns) • participate in phone-in/ SMS competitions (ns) • engage in speculative trading (ns)

a. 'ns' denotes non-significant differences.

A profile of characteristics of risk segments and non-gamblers relative to Victorian adults

NON-GAMBLERS

Compared to Victorian adults, characteristics of the segment included:

- higher proportion of adults 18-24yrs
- lower proportion of adults 35-49yrs and 50-64yrs
- higher proportion of LOTE speakers and people migrating to Australia in past 5 yrs
- larger households and higher proportion of group households
- higher proportion of university educated and lower proportion year 10 or lower
- lower proportion of managers, professionals, technicians/trades workers and clerical/administrative workers
- higher proportion of community/personal services workers, sales workers, machinery operators/drivers and labourers
- lower proportion of people personally earning under $31,199 and a higher proportion personally earning $52,000 or over
- lower proportion of households earning under $33,799 and a higher proportion of households earning $62,400 and over
- higher proportions of non-gamblers living in Eastern Metro and a lower proportion of non-gamblers in Barwon South West, Grampians, Hume and Loddon-Mallee
- lower proportion of full-time employed

NON-PROBLEM GAMBLERS

Compared to Victorian adults, characteristics of the segment included:

- lower proportion of males and a higher proportion of females
- lower proportion of adults 18-24yrs and 25-34yrs and a higher proportion of adults 35-49yrs and 50-64yrs
- lower proportion of people who speak LOTE and a lower proportion migrating to Australia in past five years
- lower proportion of professionals, technicians/tradesworkers and clerical/administrative workers and a higher proportion of community/personal services workers, sales workers, machinery operators/drivers and labourers
- lower proportion personally earning under $31,199 and a higher proportion personally earning in all other higher income brackets
- lower proportion of households earning in income brackets under $62,399 and a higher proportion earning $62,400 and over
- higher proportion of non-problem gamblers in Barwon South West, Gippsland, Grampians, Hume and Loddon-Mallee and a lower proportion in North-West metro

It should be noted that both data from the Census 2006 (including 2007 projections) and the Epidemiological Study are used to make the above comparisons. This implies that risk segments in some cases are being compared with an overall group from which they are also part (ie. within the same study). For this reason, limitations of this comparison should be considered. Tables 14 and Tables 18-20 should be referred to identify the source of data used in the above comparisons.

A profile of characteristics of risk segments and non-gamblers relative to Victorian adults

LOW RISK GAMBLERS

Compared to Victorian adults, characteristics of the segment included:

- higher proportion of males and a lower proportion of females
- lower proportion of university educated adults and a higher proportion of adults with year 10 as the highest education level
- lower proportion of professionals, technicians/tradesworkers and clerical/administrative workers and a higher proportion of community/personal service workers, sales workers, machinery operators/drivers and labourers
- lower proportion of people personally earning under $31,199 and a higher proportion earning $52,000 or higher
- lower proportion of households earning under $62,399 and a higher proportion earning $62,400 or higher
- higher proportion in full-time employment

MODERATE RISK GAMBLERS

Compared to Victorian adults, characteristics of the segment included:

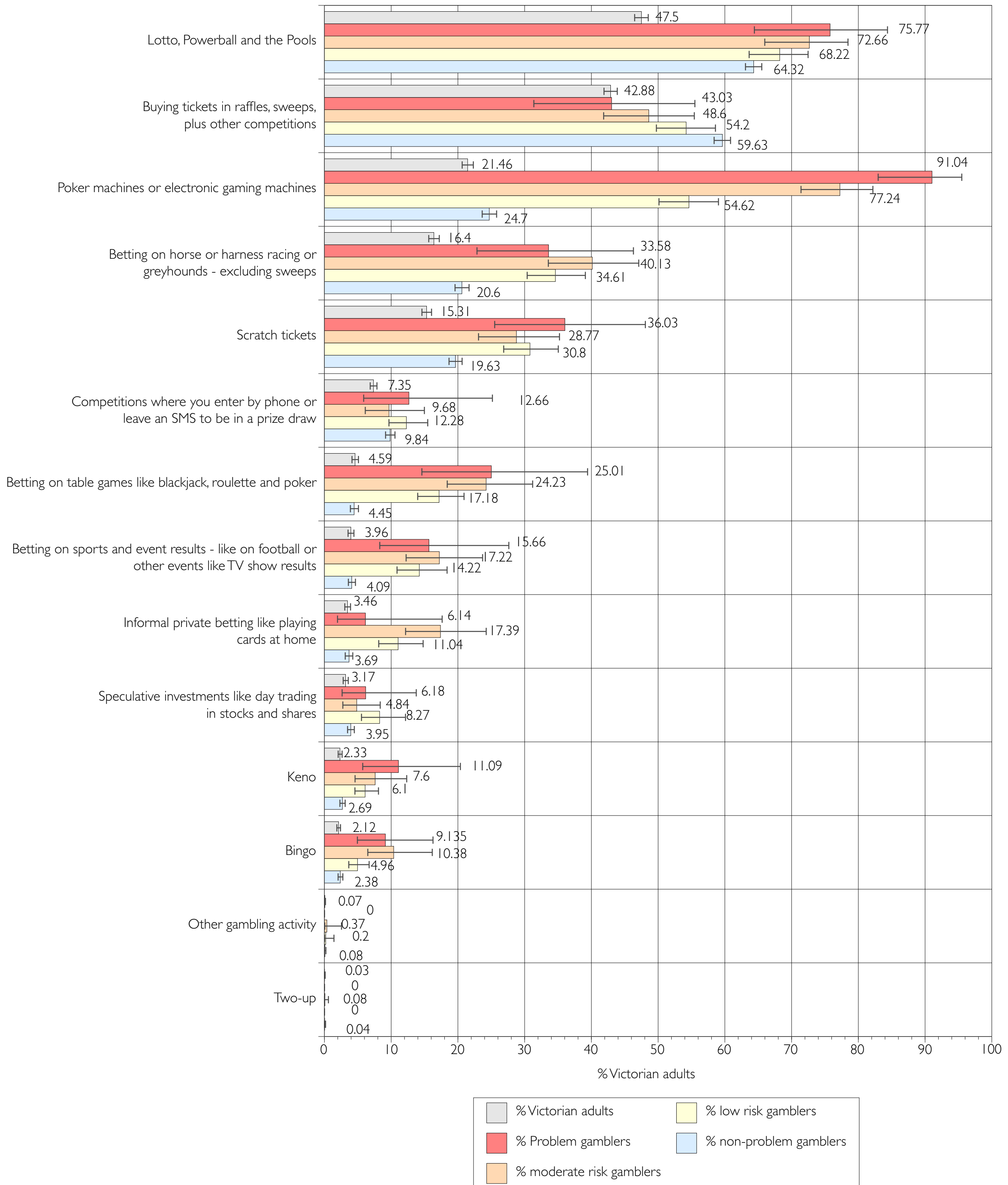
- higher proportion of males and a lower proportion of females
- higher proportion of adults 18-24yrs and lower proportion of adults 65yrs or older
- lower proportion of people with university qualifications and a higher proportion of people with year 10 or lower as the highest qualification
- lower proportion of managers, professionals, technicians/tradesworkers and clerical/administrative workers and a higher proportion of community/personal services workers, sales workers, machine operators and labourers
- higher proportion of people personally earning $52,000-$83,199 per year
- lower proportion of households earning under $33,799 per year and a higher proportion of households earning $62,400-$103,000 per year
- lower proportion of couples without children and a higher proportion of group households

PROBLEM GAMBLERS

Compared to Victorian adults, characteristics of the segment included:

- higher proportion of males and lower proportion of females
- lower proportion of people 65yrs and older
- higher proportion of people of Indigenous backgrounds
- lower proportion of people with a personal income of under $31,199 and a higher proportion with an income of $31,200-$51,999
- lower proportion of professionals, technicians/tradesworkers and clerical/administrative staff and a significantly higher proportion of sales workers, machinery operators/drivers and labourers
- lower proportion of households with an income of under $33,799 and a significantly higher proportion of households with an income of $62,400-$103,999
- lower proportion in Eastern Metro and Grampians
  lower proportion of people who have migrated to Australia in the past 5 years
  lower proportion of 'other households'

Figure 2. Participation in different gambling activities in Victoria in past year - Comparison by Canadian Problem Gambling Severity Index (July-October 2008 - N=15000)[a]



a. Question - On which of the following activities have you spent any money on in the past 12mths? (Base: All Victorian adults)

Highest spend gambling activities

Table 3 presents the highest spend channels for gamblers who identified their highest-spend gambling activity (only the top channels). While lotto/Powerball and Pools were the highest spend activity for all Victorian adult gamblers (39.99% of gamblers), the highest spend activity for problem gamblers was poker and electronic gaming machines (64.14% of problem gamblers). In addition, for problem gamblers, the second and third highest spend activities were table games (11.21%), lotto products (9.73%) and betting on horse or harness racing or greyhounds - excluding sweeps (9.47%).

A similar trend applied to moderate risk gamblers, where poker and electronic gaming machines was the highest-spend activity of 46.30% of moderate risk gamblers, but lotto products were the second highest-spend activity (17.27%), then betting on horse/harness racing or greyhounds (12.39%). However, only 8% of moderate risk gamblers reported table games as their highest-spend activity.

In the case of low risk gamblers, lotto products were the highest-spend activity (31.84% of low risk gamblers), followed by pokies (26.75%) and horse/harness racing/greyhound betting (16.21%). In the case of non-problem gamblers, highest spend activities were lotto products (45.55%), competitions (23.74%) and pokies (9.49%) (refer Table 37 for detailed results).

Highest spend channels for different gambling activities revealed a number of trends (Table 3).

Table 3. Highest-spend channels for gamblers identifying their highest-spend gambling activity (July-October 2008)[a]

For those who spent most money on...	Highest-spend channels (% refers to percent of players mentioning channel of their highest-spend channel)	For those who spent most money on...	Highest-spend channels (% refers to percent of players mentioning channel of their highest-spend channel)
Informal private betting	• card games (86.34%) • sports and event betting (5.80%) • mahjong (4.83%)	Keno	• newsagent (27.67%) • clubs (25.59%) • pubs (24.86%) • *Note: Tatts venue only (11.97%)*
Poker and electronic gaming machines	• clubs (46.65%) • pubs (31.62%) • casino (14.43%) • *Note: internet was only (0.24%)*	Scratch tickets	• newsagents (70.78%) • Tatts venue (25.78%)
Table games - like blackjack, roulette or poker	• casino (88.40%) • in other states (7.52%) • on a trip overseas (2.28%) • *Note: internet was only (0.92%)*	Bingo	• clubs (44.11%) • bingo hall (37.51%) • community hall (8.50%) • *Note: Church only (0.67%)*
Table games	• casino (88.40%) • in other states (7.52%) • on a trip overseas (2.28%) • *Note: internet was only (0.92%)*	Phone-in/ SMS competitions	• SMS competitions (64.70%) • phone-in competitions (30.17%)
Horse/harness/ greyhound wagering - excluding sweeps	• off-track at a TAB (45.31%) • pubs (18.29%) • race tracks (17.53%) • *Note: internet was only (8.29%) and phone was only (5.20%)*	Raffles/sweeps/ competitions	• schools (19.56%) • clubs (14.26%) • over the phone (12.38%) • at a workplace/office (11.77%) • shopping centre (8.89%) • mail (8.26%) • *Note: Internet only (0.64%)*
Sports and event betting - like on sports and TV shows	• TABs (41.24%) • internet (35.37%) • clubs (6.45%) • *Note: race track was only (1.70%)*	Speculative investments	• online (63.10%) • through a broker (30.59%)

a. (Base: Gamblers identifying a certain gambling activity as their highest-spend activity in the past 12 months)

Travel distance to venues

Overall trends showed that 53.74% of pokies players travelled no more than 5km to their preferred pokies venue. In contrast, table game players reported travelling much further, given that most were travelling to the casino (based in the Central Business District) (84.23% travelled more than 10km). In relation to horse/harness/greyhound racing venues, similar to the pokies, 63.55% travel 5km or less to reach their preferred venue. Overall trends thus suggest that most people do not travel very far to access venues. No significant differences were apparent between non-problem and problem gamblers for the pokies travel distances.

Reasons why people gamble

The major reported reasons people reported gambling were to win money (52.94%), general entertainment (31.76%) and social reasons (30.30%). Compared to non-problem gamblers, problem gamblers were significantly more likely to report social reasons for liking their highest-spend activity (OR=1.75, p<.05) and this relative trend also applied to the low (OR=1.47, p<.001) and moderate risk groups (OR=1.48, p<.05).

Compared to non-problem gamblers, problem gamblers were not significantly more likely to play to win money. However, compared to non-problem gamblers, low risk gamblers were more likely to play to win money (OR=1.23, p<.05).

Possibly the most other interesting differences were in relation to gambling to take your mind off things, to relieve stress and due to boredom. In particular, compared to non-problem gamblers, problem gamblers were significantly more likely to gamble to take their mind off things (OR=14.1, p<.001), to relieve stress (OR=25.39, p<.001) and for reasons of boredom (OR=6.10, p<.001). Problem gamblers were also more likely to gamble out of habit (OR=5.39, p<.01). Compared to non-problem gamblers, problem gamblers were also significantly less likely to gamble to raise money for charity (OR=0.04, p<.01).

Compared to problem gamblers, moderate risk gamblers were significantly less likely to gamble to take their mind off things (OR=0.41, p<.01), to relieve stress (OR=0.22, p<.001) and to gamble out of habit (OR=0.19, p<.001). Also noteworthy is that compared to moderate risk gamblers, low risk gamblers were significantly less likely to gamble to take their mind off things (OR=0.25, p<.001), to relieve stress (OR=0.13, p<.001) and for reasons of boredom (OR=0.04, p<.001).

Other interesting trends relating to problem gamblers

Relative to non-problem gamblers, findings of research also showed the following trends.

Poker and electronic gaming machines

- influence of linked jackpots on EGM play - findings overall showed that reported influence significantly increased with increasing risk for problem gambling (OR=2.62, p<.001). However, overall 83.97% of players reported 'no influence'
- credits bet per line during EGM play - compared to non-problem gamblers, problem gamblers were considerably more likely to bet greater than a single credit per line (OR=3.37, p<.001)
- the denominations preferred by most problem gamblers were the two cent (26.80%) and five cent machines (26.48%). However, the moderate risk, low risk and non-problem gamblers each reported mostly using one cent machines. Compared to non-problem gamblers, it was additionally apparent that problem gamblers were significantly more likely to play $1 machines (OR=8.89, p<.001)

Horse/harness racing/greyhounds

- horse/harness racing/greyhounds - problem gamblers were significantly less likely to bet each way (OR=0.28, p<.05), significantly more likely to place trifectas (OR=4.4, p<.001), significantly more likely to place quinella bets (OR=3.88, p<.05), significantly more likely to place multi-bets (OR=17.04, p<.05), and significantly more likely to place Exacta bets (OR=33.54, p<.01)
- While the overall rate of use of batch betting was quite low (only 1.57%), problem gamblers were significantly more likely to use batch betting compared to non-problem gamblers (OR=28.45, p<.01)

Sports and event wagering

- By far AFL (FootyTab) was the most common type of sport bet on (73.06%), followed by soccer (21.57%), cricket (13.13%), tennis (10.71%) and rugby (8.93%). Compared to non-problem gamblers, problem gamblers were more likely to bet on tennis (OR=13.05, p<0.01), cricket (OR=7.54, p<.05), soccer (OR=5.50, p<.05), basketball (OR=15.63, p<.05) and motorsports (OR=18.03, p<.05)

Lotto/Powerball/Pools

- There was not a clear linear relationship between the volume of numbers picked and risk for problem gambling. However, compared to non-problem gamblers, problem gamblers were significantly less likely to pick the standard 6-7 numbers (OR=0.47, p<.05) and significantly more likely to pick 8-10 numbers (OR=2.92, p<.05)

Bingo

- compared to non-problem gamblers, problem gamblers were significantly more likely to purchase four or more bingo books (OR=19.94, p<.001)
- 38.77% of adults played two books at a time, while 26.63% played three books. In contrast, roughly only one in four players (24.22%) played a single book at once. Once again, findings also showed that, compared to non-problem gamblers, problem gamblers were significantly more likely to play four or more books at once (OR=17.76, p<.001)

Responsible gambling practices of gamblers

Results suggested that 30.81% of gamblers brought between $50-$100, 27.20% brought only up to $20 and 20.61% brought between $20-50 to gambling. Findings similarly showed that, the more money people generally brought to gambling, the higher the risk of the gambler (OR=1.85, p<.001). Problem gamblers were significantly more likely to bring their EFTPOS/ATM card (OR=5.97, p<.001).

Problem gamblers were significantly more likely than non-problem gamblers to use their cards twice per session (OR=100.33, p<.001), three times per session (OR=307.21, p<.001) and four times per session (OR=82.01, p<.001). It was also worth noting that 41.16% only used their card about once per session or slightly less.

PROBLEM GAMBLING IN A PUBLIC HEALTH CONTEXT

As problem gambling is an important health and well-being issue for the Victorian community, the survey also explored a range of health and well-being determinants of problem gambling. A summary of particularly interesting insights is presented below.

Life events

Compared to non-problem gamblers problem gamblers were significantly more likely to report a range of life events in the past year including:

- report the death of someone close to them (OR=3.76, p<.01)
- report a divorce (OR=4.68, p<.01)
- report legal difficulties (OR=3.20, p<.01)
- report a major injury or illness to either themself or someone they are close to (OR=3.16, p<.001)
- have had troubles with their work, boss or superiors (OR=2.80, p<.001)
- have experienced a major change to their financial situation (OR=6.64, p<.001)
- have had increase in the arguments with someone they are close to (OR=10.15, p<.001)

Smoking

The prevalence of smoking was also quite high in moderate risk gamblers and there was generally a strong linear relationship between smoking and increasing risk status for problem gambling. Significance testing also revealed that the difference in past year smoking comparing non-problem and problem gamblers was statistically significant ($OR=4.10$, $p<.001$), as was the difference relating to current smoking habits ($OR=4.46$, $p<.001$).

Compared to non-problem gamblers, problem gamblers were significantly more likely to smoke over 40 cigarettes per day ($OR=10.64$, $p<.05$) and 42.72% reported smoking 11-20 cigarettes per day, 22.92% reported smoking 5-10 cigarettes per day and 19.65% reported smoking 21-30 cigarettes per day. There was also a general trend for cigarettes smoked to increase with increasing risk status for problem gambling ($OR=1.46$, $p<.001$).

Alcohol

Alcohol consumption for problem gamblers was not significantly higher than non-problem gamblers, however, the result was tending towards significance ($OR=0.56$, $p=.06$). This seemed to be linked to a lower alcohol consumption rate in female problem gamblers, as male problem gamblers had consumed alcohol at a higher rate than female problem gamblers.

When problem gamblers consume alcohol, they also tend to consume larger amounts. Indeed, while non-problem gamblers consumed only an average of 6.88 alcoholic drinks per week, problem gamblers consumed an average of 10.97. Moderate risk gamblers also consumed 11.06 drinks per week.

Statistical significance testing also suggested a significant difference existed between the gambling risk groups ($F=6.95$. $p<.001$), with both problem gamblers ($t=-2.01$, $p<.05$) and moderate risk gamblers ($t=-3.64$, $p<.001$) consuming on average a significantly higher number of drinks per week, than non-problem gamblers.

In the case of males, findings showed that, compared to non-problem gamblers, moderate risk gamblers were significantly more likely to be in the risky alcohol consumption category, with 11.35% consuming over 29-42 drinks per week ($OR=3.35$, $p<.01$). However, the difference between non-problem and problem gamblers for males was not statistically significant.

In the case of females, compared to non-problem gamblers, problem gamblers were significantly more likely to report risky alcohol consumption ($OR=11.83$, $p<.001$), with 24.60% reporting drinking 15-28 drinks per week. In addition, female problem gamblers were also significantly less likely to report levels of alcohol consumption consistent with low risk, compared to non-problem gamblers ($OR=0.30$, $p<.05$). Moderate risk gamblers also showed similar trends, with again a statistically significant difference apparent, compared to non-problem gamblers on risky alcohol consumption ($OR=3.15$, $p<.01$).

Alcohol dependence

The CAGE alcohol screen was used in the study to screen for alcohol abuse and dependence. Findings overall showed that 73.16% of adult gamblers in Victoria reported no signs of clinical alcohol abuse, with not a single item of the CAGE screen endorsed. In contrast, 1.04% reported high levels of clinical alcohol abuse, 4.28% reported moderate levels of abuse, 8.41% reported signs of alcohol abuse and 13.11% were at-risk, having endorsed a single item. Findings also revealed that, compared to non-problem gamblers, problem gamblers were significantly:

- less likely to report no signs of clinical alcohol abuse ($OR=0.31$, $p<.001$)
- more likely to report signs of clinical alcohol abuse ($OR=2.56$, $p<.01$)
- more likely to report moderate levels of clinical alcohol abuse ($OR=5.13$, $p<.01$)
- more likely to report high level of clinical alcohol abuse ($OR=22.94$, $p<.001$)

Similar trends applied to moderate risk gamblers, with moderate risk gamblers being significantly less likely to report no signs of alcohol abuse ($OR=0.34$, $p<.001$) and significantly more likely to report high levels of alcohol abuse ($OR=6.16$, $p<.01$).

Drug use

The patterns of drug use were also measured in moderate risk and problem gamblers in the study. This included prompting respondents about their use of certain classes of drugs and pharmaceuticals for non-medical purposes. Findings showed that the most common drugs for 'regular use' included prescription pain killers (3.96%), marijuana/hashish (3.75%) and amphetamines (2.24%). In contrast, the most common forms of drugs for 'occasional use' included marijuana/hashish (14.26%), prescription pain killers (10.18%) and amphetamines (6.78%). Ecstacy/designer drugs also followed closely based on 'occasional use' (6.16%).

Significance testing also showed that problem gamblers were not significantly more likely than moderate risk gamblers to use any of the drug classes. However, problem gamblers may use ecstacy/designer drugs somewhat less than moderate risk gamblers (ie. the result was tending towards significance - $OR=0.12$, $p=.09$).

Self-reported health

Findings showed that 32.99% of all gamblers reported their health as 'very good', 27.98% reported their health as 'good' and 23.03% reported their health as 'excellent'. There was also a strong tendency for health to decline with increasing risk status for problem gambling ($OR=1.54$, $p<.001$). Findings also showed that, compared to non-problem gamblers, problem gamblers reported:

- a slightly higher rate of diabetes (although this was only tending towards significance) ($OR=1.92$, $p=0.07$)
- a significantly higher rate of lung conditions including asthma ($OR=2.40$, $p<.01$)
- a significantly higher rate of depression ($OR=11.78$, $p<.001$)
- a significantly higher rate of anxiety disorders ($OR=10.82$, $p<.001$)
- a significantly higher rate of obesity ($OR=3.21$, $p<.001$)
- a significantly higher rate of other miscellaneous physical or mental health conditions ($OR=2.55$, $p<.01$)

Disabilities

Comparative analyses with non-problem gamblers also showed that problem gamblers were:

- significantly more likely to self-report depression as a disability ($OR=6.55$, $p<.001$) (a separate question from the unprompted health conditions above)
- significantly less likely to report hip/knee/shoulder injuries/problems/replacements ($OR=0.29$, $p<.05$)

Psychological distress

Findings overall suggested that 89.50% of Victorian adult gamblers were likely to be well, 5.56% were likely to have a mild psychological disorder, 2.68% were likely to have a moderate mental disorder and 2.26% were likely to have a severe mental disorder. Compared to non-problem gamblers, problem gamblers were also significantly:

- less likely to be well ($OR=0.06$, $p<.001$)
- more likely to have a mild disorder ($OR=4.80$, $p<.001$)
- more likely to have a moderate mental disorder ($OR=11.04$, $p<.001$)
- more likely to have a severe mental disorder ($OR=21.90$, $p<.001$)

There was also a general tendency for psychological distress to increase, as gambling risk status increased ($OR=2.38$, $p<.001$).

Suicide ideation and offending intentions

Results highlighted that 27.06% of problem gamblers and 6.07% of moderate risk gamblers considered taking their own life in the past year and respectively, 15.17% and 3.46% said their gambling led them to do something that is technically against the law.

Results also revealed that problem gamblers were significantly more likely to have considered taking their own life compared to moderate risk gamblers ($OR=5.74$, $p<.001$) and were also significantly more likely to have done something that is technically against the law (as a result of gambling) ($OR=4.99$, $p<.01$).

Experience of trauma and hardship in life

As part of the study, gamblers were also asked to report whether they had experienced any past trauma or hardship in life. A total of 20.81% of gamblers reported a lot of trauma, hardship and problems in their life or upbringing. Results also suggested that problem gamblers reported significantly more trauma and hardship than non-problem gamblers (OR=3.95, $p<.001$). This was also significantly higher in moderate risk gamblers (OR=2.03, $p<.001$), but not for low risk gamblers.

PROBLEM GAMBLING IN FAMILIES AND FRIENDS

Recognition of problem gambling

Most people (67.35%) recognised their gambling problem under 5 years ago. No significant differences were noticed between problem and moderate risk gamblers.

Problem or at-risk gambling in families

As part of the study, moderate risk and problem gamblers were asked to indicate whether they believed anyone in the family may be at-risk of either having or developing a gambling problem. It was more common that respondents knew a brother (4.76%) or father (4.42%) either with or at-risk of developing a gambling problem. Other family members included spouses/partners (3.83%), sisters (3.38%) and mothers (3.18%).

Findings showed that problem gamblers, relative to moderate risk gamblers, were significantly:

- more likely to believe their sister may have a problem or be at-risk (OR=4.40, $p<.05$)
- less likely to say 'no-one else' has a problem or is at-risk' (OR=0.46, $p<.05$)
- more likely to report their son/daughter to have a problem or be at-risk (OR=5.48, $p<.05$)

Whether friends or acquaintances are at-risk for problem gambling

Whether friends or acquaintances of moderate and problem gamblers were reported to be at-risk for problem gambling or recognised to have a problem was explored in the study. The most common response was to know a male friend who doesn't live with the respondent (19.06%), followed by knowing a female friend (8.69%). Seeing a male friend who they lived with at-risk or experiencing problem gambling was a further common response (3.53%).

EMERGENCE OF PROBLEM GAMBLING THROUGHOUT THE LIFESPAN

When gambling started

The age at which moderate risk and problem gamblers started gambling for money was measured in the study. As shown, while 50.01% started at age 18-24 years and 20.69% started under the age of 18. Reported triggers for commencing gambling included general entertainment (39.83%), social reasons (31.38%) and to win money (16.39%).

Help seeking for problem gambling

Whether moderate risk and problem gamblers sought help for problem gambling and from whom the help was sought was measured in the study. As shown, 8.78% of both groups sought help in the past year and this included 25.55% of problem gamblers. The tendency for help seeking was also significantly higher in problem gamblers, compared to moderate risk gamblers (OR=8.75, $p<.001$).

Findings also showed that 24.17% sought help from counselling professionals, 18.82% from a female relative and 13.55% from a male friend. Around 10.50% presented to Gambler's Help. Problem gamblers were significantly more likely to seek help from a counselling professional than moderate risk gamblers (OR=27.10, $p<.05$).

Type of help received and who made the referral

In terms of the type of help received for problem gambling, personal counselling was most commonly reported as the major type of help provided (37.86%), followed by informal friendship support (27.25%). Around 5.86% also received help for food/money or clothing. No significant differences, however, were observed between problem gamblers and moderate risk gamblers.

In relation to who referred the person to help, findings showed that 74.50% made a self-referral, 8.01% were referred to help by a male friend and 6.28% were referred by a doctor or medical professional. Once again, differences were not statistically significant.

Usefulness of activities to help reduce gambling

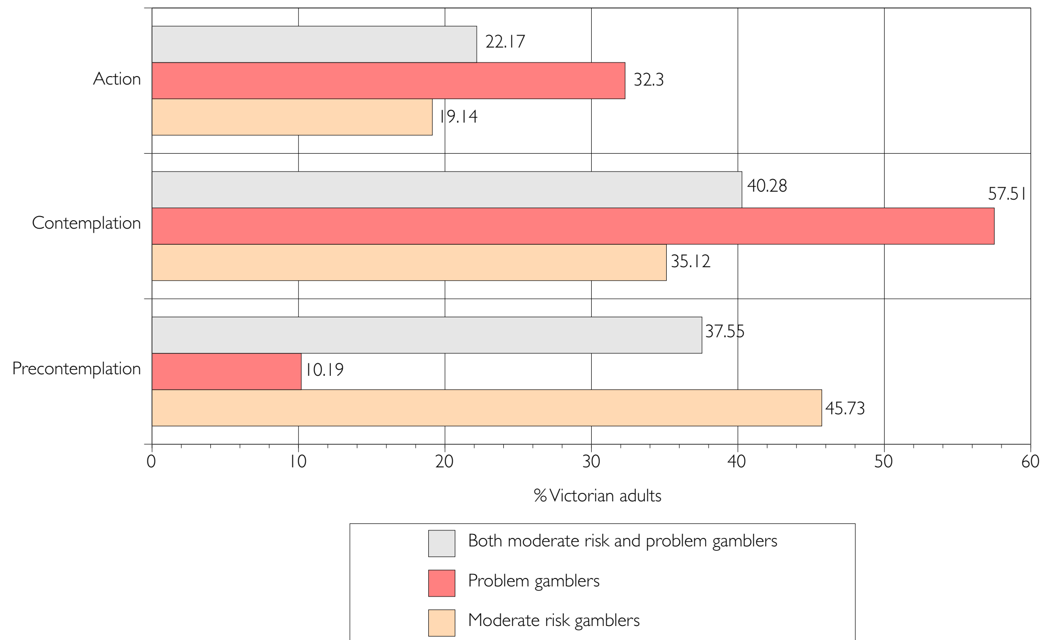
As part of the study, moderate risk and problem gamblers were asked to rate the usefulness of various activities to help reduce their gambling. Activities with the highest usefulness ratings included having more leisure interests (mean=3.42), having a wider social network (mean=2.67), having more money (mean=2.54), finding a relationship partner (mean=2.51) and information on the odds of winning in gambling (mean=2.45). Findings also revealed, that compared to moderate risk gamblers, problem gamblers rated the idea of having more leisure interests as more useful, although this was only tending towards significance ($t=-1.80$, $p=.07$).

Change-readiness of at-risk gamblers

The level of change-readiness of moderate risk and problem gamblers to changing their gambling behaviour was measured in the study. Findings overall suggested that 57.51% of problem gamblers were already thinking about reducing their gambling (in contemplation), 32.30% were already reducing their gambling (in action stage) and only 10.19% were in precontemplation. This emphasises that many problem gamblers are likely be cognisant that their gambling is somewhat problematic.

In the case of moderate risk gamblers, however, a much larger number were in precomtemplation (45.73%), 35.12% were in contemplation and 19.14% were in action. This highlights that moderate risk gamblers are generally more likely to not be thinking about changing their gambling and hence may not be convinced that their gambling is a problem.

Figure 3. Readiness to change gambling behaviour by Canadian Problem Gambling Severity Index (N=411, July-October 2008)[a]



a. Question - The following questions are designed to identify how you personally feel about your gambling right now. Using a scale where 1=strongly disagree and 5=strongly agree (3 is neutral), how much do you agree or disagree with the following statements? (Base: Moderate risk and problem gamblers)

Conclusion

Findings of the epidemiological study of problem gambling identify a diverse range of interesting new insights about the prevalence and the distribution of problem gambling in Victoria, along with insights relating to possible determinants of problem gambling from a public health perspective. Such findings will be instrumental in helping shape future policy and strategy for problem gambling across Victoria and will assist in designing effective responses to minimising the harms of problem gambling in the Victorian community.

Introduction

Overview

This report presents findings of a study of the epidemiology of problem gambling in Victoria. Epidemiology is the study of the distribution and determinants of health related states or events in specified populations, and the application of this study to control health problems. In this context, the current study investigated the prevalence and distribution of problem gambling in Victoria, along with the various factors associated with increased risk for problem gambling.

The current study takes a very different and perhaps unique approach to examining problem gambling in Victoria. Unlike past studies, this study examined gambling patterns in the community from a population health perspective. This involved *not only* measuring the prevalence of different forms of gambling, *but also* importantly, the health and well-being determinants of problem gambling. From this viewpoint, problem gambling is viewed as an important health and well-being issue for Victorians and similar to other health issues, is influenced by a diverse range of health, social and other determinants.

Largest study ever for Victoria

The current study is also the largest study ever of problem gambling in Victoria. A total of N=15000 respondents were interviewed via Computer Aided Telephone Interviewing (CATI) to ensure high quality data for Victoria and its population health planning regions. For this reason, the sample was stratified across the eight Victorian Government regions. This sampling methodology was important to allow a solid foundation of knowledge to be developed about gambling for metropolitan and regional Victorian communities. Interviewing was conducted July-October 2008.

New perspectives on gambling

In the epidemiological study, a new approach was taken to defining 'gambling'. This included differentiating the measurement of gambling activities from the channels through which gambling activities are delivered (eg. pokies can be played through clubs, pubs or online). New activities measured included participation in event wagering (eg. wagering on the outcomes of TV shows), participation in SMS or phone-in competitions and participation in speculative stock investments (such as day-trading in stocks and shares).

Specific gambling activities measured in the study were:

- Informal private betting for money (like playing cards at home)
- Playing the pokies or electronic gaming machines (EGM)
- Betting on table games like blackjack, roulette and poker
- Betting on horse or harness racing or greyhounds - excluding sweeps
- Betting on sports and event results - like on football or TV show results
- Lotto, Powerball or the Pools
- Keno
- Scratch tickets
- Bingo
- Competitions where you pay money to enter by phone or leave an SMS
- Raffles, sweeps and other competitions
- Speculative stock investments like day trading (without a long term strategy)

Interesting design features of the study

The epidemiological study of problem gambling included many design features that had not been previously trialled in past prevalence studies. Notable design features of the study included:

- concentration of study sampling within high Electronic Gaming Machine (EGM) expenditure Local Government Areas (LGA) across Victorian Government regions
- use of random digit dialling to ensure improved coverage of households in Victoria (given that a current version of electronic Whitepages is no longer available on disk)
- screening of all past year gamblers for risk for problem gambling
- screening of all people who had ever gambled for risk for lifetime problem gambling
- use of a range of validated health measurement scales including use of the Kessler-10 (measurement of generalised psychological distress), the CAGE alcohol screen (measurement of clinically significant alcohol abuse), the Gambling Readiness to Change Scale (for measurement of readiness to reduce gambling) and measurement of a diverse range of health conditions and health behaviours (eg. general health, health conditions and disabilities, smoking, alcohol and drug use, suicide ideation, illegal activities etc.)

Epidemiological study methodology and sampling design

Measurement of problem gambling

Problem gambling has been traditionally measured using a range of validated measurement scales. The accepted Australian national measurement scale for measuring risk for problem gambling is the nine-item Canadian Problem Gambling Severity Index (PGSI) (Ferris and Wynne, 2001). For this reason, the PGSI was also used in the current study.

In the Victorian Epidemiological Study of Problem Gambling, all 15000 respondents playing at least one gambling activity in the past year were screened using the nine-item PGSI. This included even players who played forms of gambling such as only lotto or scratch tickets. This was undertaken to explore potential risk for problem gambling across the whole of the Victorian population. This was also seen as important, given the changing nature of gambling and channels for accessing gambling.

The PGSI measures an individual's risk for problem gambling by segmenting gamblers into four key risk categories based on a total risk score out of 27. Specifically, these are:

- Non-problem gamblers (a score of 0 on the CPGSI)
- Low risk gamblers (a score of 1-2 on the CPGSI)
- Moderate gamblers (a score of 3-7 on the CPGSI)
- Problem gamblers (a score of 8 or higher on the CPGSI)

For consistency with other states in Australia, the Queensland Household Gambling Survey PGSI scale anchors were used in lieu of the original PGSI scale anchors.

Using ratings of Never *(score of 0)*, Rarely/Sometimes *(score of 1)*, Often *(score of 2)* and Always *(score of 3)*, defining items of the CPGSI ask an individual to think about the past year and rate *'How often you have'*:

- *Bet more than you could really afford to lose?*
- *Needed to gamble with larger amounts of money to get the same feeling of excitement?*
- *Gone back another day to try to win back the money you lost?*
- *Borrowed money or sold anything to get money to gamble?*
- *Felt that you might have a problem with gambling?*
- *Felt guilty about the way you gamble, or what happens when you gamble?*
- *Has your gambling caused any financial problems for you or your household?*
- *Had people criticize 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 you any health problems, including stress or anxiety?*

Measures

To ensure a detailed assessment of problem gambling in a public health context, a range of important health and well-being measures were examined in the study. This included, where possible, validated measurement instruments used in population health settings. Apart from the Canadian Problem Gambling Severity Index, discrete validated measurement instruments used in the survey included:

- The NODS-CLiP2 - was used to measure the lifetime prevalence of problem gambling/ pathological gambling. The 5 item scale is currently not published. It was developed by Rachel Volberg and Yoku Shaw Taylor
- The CAGE alcohol screen - was used to measure risk of clinically significant alcohol abuse (Ewing, 1984)
- Self-reported health - a measure of general health was assessed by asking respondents to indicate whether their health was excellent, very good, good, fair or poor. This has been shown to be generally a good predictor of ill-health, future health care needs and other behavioural and psychosocial risk factors (eg. Idler & Benyami, 1997)
- Kessler-10 - a measure of psychological distress was used, which has also been used in Australian Bureau of Statistics Health Surveys (Kessler et. al, 1992)

- Social capital items - as used as in Victorian Population Health surveys, these items explored issues such as social support and whether people liked living in their community
- The Gambling Readiness-to-Change Scale - the scale segmented gamblers into precontemplation, contemplation and action in terms of their preparedness to reduce their gambling behaviour, as devised by Rollnick et al. (1992)

In addition, a range of other comorbidities were also measured in the study including alcohol consumption, smoking, the influence of life events on problem gambling, health conditions, offending behaviours, suicide ideation, drug use and disabilities affecting a person's day-to-day life. A copy of the survey instrument is presented in the Appendix.

Ethical review

To ensure an ethically-sound approach to the research, a rigorous ethical review process was applied to the design and conduct of the study. This helped ensure that any vulnerable respondents were assisted with information and support where identified during the course of the research. This included design of the Computer Aided Telephone Interviewing program to automatically ensure that 'at-risk' respondents were offered help in line with their needs and a 'warm referral' process was offered where respondents were able to be called by counsellors. This was supported by the Gambler's Help line. National Health and Medical Research Council Guidelines were used to guide the ethical review process, in conjunction with advice from Department of Human Services.

Sampling

Random digit dialling (RDD) was used in the survey process for household selection. Random digit dial sample was generated to align to the Local Government Areas within Victoria. Random digit dialling is also necessary nowadays, given the limited availability of current electronic Whitepages residential listings on disk and the additional issue that a reasonable proportion of households have private numbers.

The approach to sampling included:

- Stratification of sampling in line with the key Victorian Government Regions - this implied that, if a certain percent of the population came from a certain Victorian Government region, this was set to the same percent of the total sample of N=15000
- Within each region of Victoria, three Electronic Gaming Machine Expenditure bands were formed - This included low, medium and high expenditure bands. Local Government Areas were then allocated to each band based on the per capita EGM expenditure for 2006-2007 (based on data supplied by the Victorian Commission for Gambling Regulation). In some cases, this implied that certain LGAs may have had only medium or high spend bands and hence no low expenditure bands - Spend bands cut-offs were defined by listing the per capita EGM expenditure amounts from low to high and allocating one-third to each band
- Within each spend band, RDD numbers relating to different LGAs were pooled and numbers randomly selected with approximately 70% of the total sample coming from the high spend band, 20% of the sample from the medium spend band and 10% of the sample from the low spend band - This implied that sampling favoured high EGM and medium EGM spend band areas. This was designed to improve identification of problem gambling
- From this point, sampling was completely random with no age or gender quotas, however, weighting allowed for gender and age adjustments. The 'most recent birthday' method was also used to select a respondent randomly within each household
- Participation of respondents by age and gender was closely monitored during the research. This also permitted strategies to assist in building a representative profile of respondents. For instance, in cases where low participation from young males was apparent, strategies were developed regularly to improvement engagement with young people during the early interview stage to improve response rates. Strategies to improve response rates were then continually trialled and refined in the context of the research

A 'batch and exhaust' style methodology was used to load sample progressively into the CATI system. This implied loading batches of phone numbers into the CATI system until each batch was exhausted. This was important to ensure that numbers were exhausted as far as possible prior to loading additional 'virgin' sample. As quotas were nearing at the Victorian Government region level, progressively smaller sample batches of RDD numbers were loaded prior to exhausting the sample (as low as 1% of the total sample). While not a perfect methodology, this methodology achieved a good balance between ensuring that all sample was exhausted as far as possible in the project, whilst still allowing interviewing to progress at a reasonable rate.

RDD number geographic concordance

As random digit dial numbers cannot be perfectly allocated to Local Government Areas (initial allocations are only a rough estimate of the likely location of the number), the following steps were used to achieve concordance between telephone numbers generated and the allocation of a respondent to a given LGA (and accordingly, to a correct EGM spend band):

- a large batch of RDD numbers for Victoria was generated using an RDD number generator with an aim to cover all post codes within Victoria
- approximate concordance between RDD phone numbers and post codes was determined using a phone pre-fix postcode concordance database - as phone prefixes can span across postcodes and LGAs, this first step was only an estimation of the location of the respondent in a postcode/LGA/Victorian Government region
- postcode to LGA concordance information was then sourced from the Australian Bureau of Statistics and RDD numbers were allocated to a 'predicted' LGA
- some postcodes which existed, yet were not in the ABS Concordance database were manually viewed from a postcode map and were allocated the nearest concording postcode (and in turn, LGA)
- once the estimated LGA concordance was established, a batch of numbers was allocated in proportions in line with the sampling frame (see below)
- during the survey, respondents were asked to confirm their true LGA during interview - this implied that some numbers (respondents) were then reallocated to a new LGA
- in the case that respondents did not know their LGA, a respondent's suburb was also requested - this allowed the correct LGA to be identified through a manual process

The location of respondents within Victoria was also screened prior to interview commencement. This allowed respondents in border areas in NSW and SA to be excluded from the sample.

Sample sizes within and across EGM expenditure bands are shown in Table 4. As shown, the sample size allocation to each EGM spend band was only approximately 70/20/10, given that expected LGAs (based on phone prefix numbers) did not perfectly concord with actual LGAs (which were confirmed during interviews or ascertained from respondents providing their suburb). In addition, some areas such as Gippsland were allocated zero sample in the low band as the area had per capita EGM expenditure levels, which could not be justifiably allocated to a low band.

Table 4. Sample size within and across EGM Expenditure bands for the epidemiological study (N=15000, July-October 2008)

Type of LGAs	Barwon South-West	Eastern Metro	Gippsland	Grampians	Hume	Loddon-Mallee	North-West Metro	Southern Metro	Total N
Low EGM spend band	102 *(10%)*	329 *(11%)*	0 *(0%)*	68 *(11%)*	78 *(10%)*	104 *(12%)*	490 *(11%)*	298 *(8%)*	1469 *(100%)*
Medium EGM spend band	194 *(19%)*	566 *(19%)*	216 *(30%)*	136 *(22%)*	151 *(20%)*	166 *(19%)*	1095 *(24%)*	745 *(21%)*	3269 *(100%)*
High EGM spend band	740 *(71%)*	2022 *(69%)*	500 *(70%)*	409 *(67%)*	527 *(70%)*	607 *(69%)*	2911 *(65%)*	2546 *(71%)*	10262 *(100%)*
Totals	1036	2917	716	613	756	877	4496	3589	15000

Subsampling

As there was a desire to maximise the available sample for the study, following administration of the questions relating to gambling participation and the Canadian Problem Gambling Severity Index (where the entire population was screened), only non-problem gamblers were subsampled for completion of the main study. In total, 1 in 3 non-problem gamblers were selected for the main interview. This was primarily for reasons of cost-effectiveness. The design of the study was also structured such that non-gamblers completed very few questions.

The total sample achieved from the epidemiological study is presented in Table 5.

Table 5. Sample breakdown of epidemiological study (N=15000, July-October 2008)

CPGSI risk segments	Starting sample	Sample taking part in main study
Non-Problem Gamblers	9986	1 in 3
Low Risk Gamblers	837	1 in 1
Moderate Risk Gamblers	317	1 in 1
Problem Gamblers	95	1 in 1
Non-Gamblers	3765	Completed only a small number of questions and then survey demographics
Total	15000	15000

Data weighting

Data in the epidemiological study were weighted to ensure that the sample was as close to the Victorian population as possible. The purpose of weighting, in broad terms, is to correct for distortions in sampling. This typically includes making adjustments for the different probabilities of sampling within and across spend bands and Victorian Government regions (eg. due to the 70%, 20%, 10% EGM band sampling approach across 8 Victorian Government regions) and to adjust for population characteristics (eg. age, gender, region). A full description of the weighting methodology is presented in Methodology used for data weighting on page 274. This includes information on how the selection weights, intra-region sampling weights and the population benchmark weights were calculated. The weighting methodology was agreed to by Project Board members prior to implementation.

Data imputation

For data used in weighting, a data imputation methodology was followed. This involved inserting a value for a small number of cases where data was missing. This was needed to ensure that the full data set could be weighted. This included a random value imputation methodology for missing values for age and phone lines in household and a partial logic method for the total adults in the household variable. The approach is detailed in the section - Data imputation methodology for epidemiological data on page 281.

Outliers

Apart from correcting clearly obvious 'mistakes' during the data editing stage at the conclusion of the study, outliers were not excluded from the analysis (including multivariate outliers). However, ranges of values were formed in cases where outliers had the ability to disproportionately affect means. In ten cases, validating calls with respondents directly were also made to correct data values recorded.

Refusal conversions

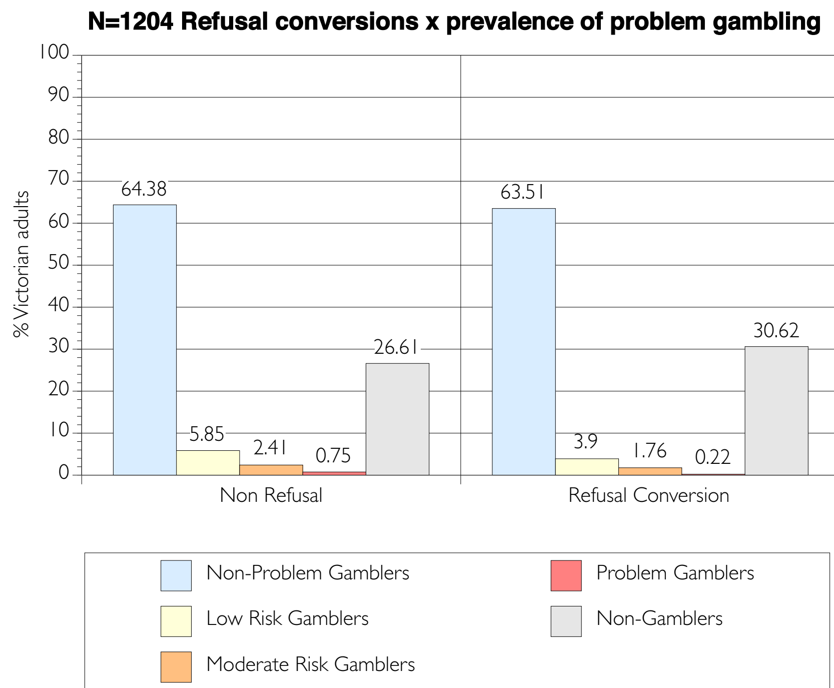
To further improve the representativeness of sampling, households or respondents who initially refused to complete the survey were coded into either a soft or a hard refusal. Soft refusals implied that there may be some likelihood that a respondent may be interested to take part in the survey at a later time. Typically, this was due to a respondent just being very busy at the time of the call and hence not able to reschedule a call back (eg. leaving the house at the time of the call, looking after a young baby or cooking dinner). Hard refusals, in contrast, were when the respondent was not at all interested to participate, usually evidenced through the reasons given for non-participation (eg. disliking surveys period) or intonation (eg. respondents being upset that they were randomly selected).

In total, 1204 refusal conversions were conducted as part of the project. This involved successfully converting an initial soft refusal to a complete survey. To avoid the encouragement of refusals by interviewers, a separate group of interviewers conducted the refusal conversion interview process.

This involved setting up a completely separate project which could be sensitively managed and monitored. Interviewers were also given training to understand the need for an appropriate balance in converting respondents to interview (eg. not to be pushy). A range of scripts were also trialled and evaluated for this purpose through the refusal conversion period. Safeguards were also put in place including careful monitoring by supervisors for sensitivities.

The prevalence rate of problem gambling achieved from the refusal conversion sample was marginally lower than the overall prevalence rate of problem gambling in non-refusal participants. Risk for problem gambling for the refusal conversion and non-refusal conversion samples is shown in Figure 4.

Figure 4. Refusal conversion sample - Highlighting prevalence of problem gambling (Refusal conversion sample N=1204)[a]



a. Based on the nine item Canadian Problem Gambling Severity Index risk category (Base: All Victorian adults)

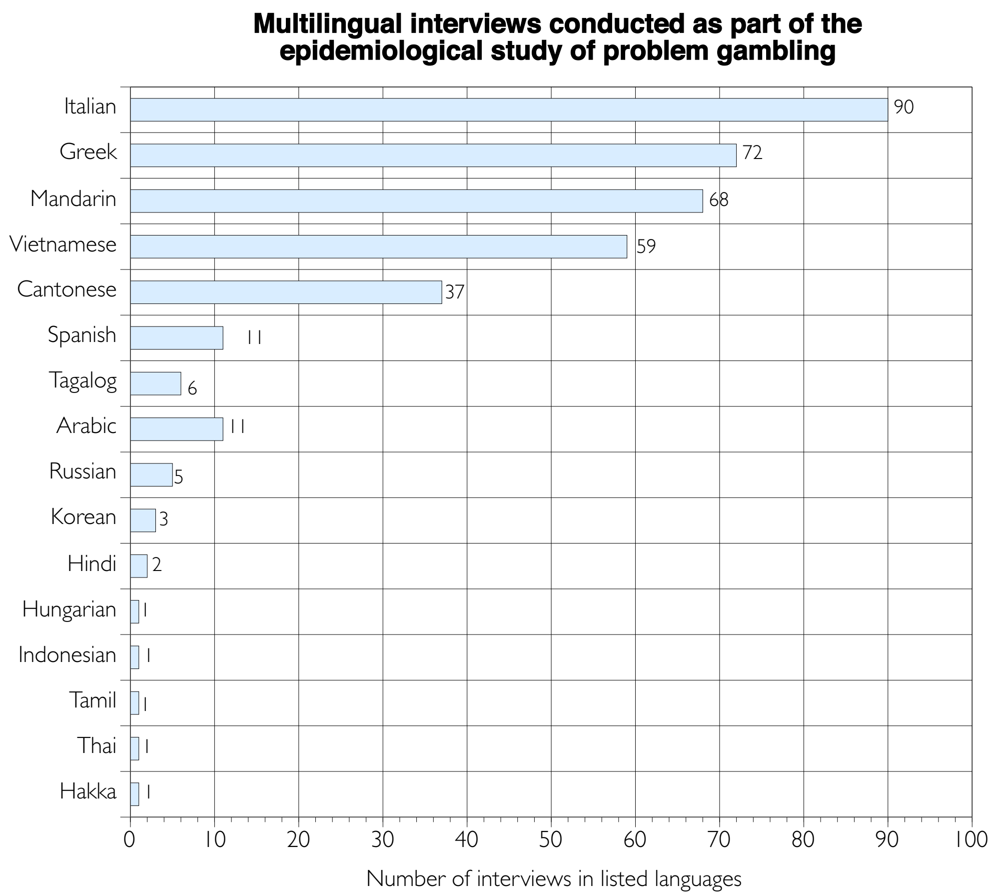
Multilingual interviewing

As part of the study, 369 multilingual interviews were undertaken in a range of non-English languages. The coverage of languages achieved through the multilingual interviewing is presented in Figure 5.

The approach to multilingual interviews included:

- having interviewers listen carefully for cases of non-English speaking households
- pooling of numbers that may be targeting a non-English speaking household
- where possible, using basic English to identify the type of language that was in the household
  (interviewers were also trained in methodologies for doing this)
- identifying the availability of native language interviewers for the target language
- randomly selecting a pool of non-English speaking households for interview
  (in line with available multilingual interviewing budgets)
- conduct of multilingual interviews in the target languages

Figure 5. Multilingual interviews conducted as part of the epidemiological study (N=369)



Length of survey

The CATI main study survey administered for the epidemiological study of problem gambling on completion was an average of 13-14 minutes in length. A breakdown of the minutes of different sections of the survey completed by different groups is presented in Table 6. As the survey length decreased with practice effects, some additional time available in the budget also allowed additional multilingual interviews (in addition to budgeted interviews) and a survey refusal conversion process, where soft refusals were attempted to be converted to a longer survey.

Table 6. Survey length breakdown of epidemiological study (N=15000, July-October 2008)

CPGSI risk segments	Main study minutes	Study minutes for multilingual interviews
Non-Problem Gamblers	13-14 minutes	16-17 minutes
Low Risk Gamblers	23-24 minutes	36-37 minutes
Moderate Risk Gamblers	32-33 minutes	43-44 minutes
Problem Gamblers	38-39 minutes	74-75 minutes
Non-Gamblers	7-8 minutes	8-9 minutes

Interviewer training

Prior to commencement of interviewing, all interviewers were trained in a number of areas and written briefing information was supplied. Training went for a period of four hours. This included developing knowledge and skills of the interviewers in:

- understanding problem gambling and sensitivities and vulnerabilities of respondents including how to best manage sensitivities during the project and any critical incidents or emergency events (eg. something unexpected happening to a respondent)
- how to engage potential interviewees to promote as high consent rates as possible
- understanding the range of gambling activities available in Victoria, along with the different channels for accessing gambling (and associated more technical gambling activity specific information - eg. different types of bets wagered etc.)
- understanding the objectives of the project including the need for measurement precision in particular areas of the survey such as administration of the PGSI and other validated instruments - this also included stressing the need to read the survey script carefully and word-for-word (with an emphasis on particular care in the PGSI and NODS-CLiP2)
- the need to reassure participants that their survey would only be presented in a de-identified format to ensure strict confidentiality of findings
- the need for interviewers to assist in cases where respondents wanted to access their survey results, as is a requirement of current privacy legislation.

The performance rate of every interviewer was also monitored on a daily basis, particularly in terms of their ability to achieve consent to interviews. In cases where interviewers were having difficulties achieving consent, coaching and training were offered. If some interviewers were finding it consistently difficult to achieve informed consent, they were allocated to different projects.

Piloting

Piloting of the study was conducted as part of the project. Prior to implementation of the methodology for the study, the sampling frame design, gambling activities and many other survey questions were also 'piloted' in a further separate study for Department of Justice of approximately N=1700. This implied that very few changes needed to be made in the study, given that the first study had given an opportunity to 'iron-out' most identified issues. The CATI script was also thoroughly and extensively checked prior to commencement of field work.

Response and consent rates

Calculation of response and consent rates is both an art and a science. Response rates for a survey are typically derived by working out the total potential of qualifying sample items and calculating a percent of surveys completed. Consent rate, in contrast, is best defined as the percent of respondents who agreed to a survey once contacted.

As there is wide debate about ways of calculating response rate and not an agreed approach (there is always debate about which numbers qualify as being 'in-scope'), a couple of variants for response rate are presented. One response rate calculation is less conservative, while the other is more conservative. Hence, both options are only showing potential response rate methodologies, as it is clear that methodologies can be interpreted differently.

Based on this analysis, the survey response rate was calculated to range from 43.50% (very conservative) to 52.65% (least conservative). The calculated consent rate based on only respondents refusing and participating was 59.37%. Findings also showed that the drop out rate once a survey had commenced was very low with 95.30% of people continuing to completion once commenced.

RDD studies frequently achieve lower response rates compared to studies based on the Whitepages (ie. residential listings), given that it is more difficult to confirm whether RDD numbers are actually qualifying numbers. For instance, RDD often generates a significantly higher proportion of 'dead numbers' that may ring, yet are never answered. Whitepages is only available on disk for 2004 and for this reason was not used in the research (as the database was too out-of-date for the study).

It is apparent from other prevalence studies that most tend to use less conservative methods of calculating response rate, so specific methodologies should be considered if any comparisons are drawn (particularly how 'in-scope' sample is defined). For this purpose, the least conservative response rate should be considered a rough benchmark, with comparative limitations acknowledged.

Table 7. Survey response rates and consent rates for the epidemiological study of problem gambling (July-October 2008)

Description of call statistics[a]	N	% of total RDD numbers dialled	Qualifying numbers considered 'in-scope'[b] and hence used in the calculation below are indicated		
			Less conservative method for response rate calculation	More conservative method for response rate calculation	Survey consent rate
Mid survey refusals	740	0.84	740	740	740
Other miscellaneous refusals	21	0.02	21	21	21
No english-Language identified	489	0.56	489	489	-
No english-Language not identified	1682	1.91	1682	1682	-
Away for 8wk field period (eg. living overseas)	308	0.35	-	308	-
Illness-away for 8wk field period	110	0.12	110	110	-
Unable to take part - other reason (other than refusals)	466	0.53	-	466	-
Refused Household - HARD Male (no questions)	2424	2.75	2424	2424	2424
Refused Household - SOFT Male (no questions)	285	0.32	285	285	285
Refused Household - HARD Female (no questions)	3054	3.47	3054	3054	3054
Refused Household - SOFT Female (no questions)	573	0.65	573	573	573
Refused Respondent - SOFT Male (no questions)	290	0.33	290	290	290
Refused Respondent - SOFT Female (no questions)	385	0.44	385	385	385
Refused Respondent - HARD Male (no questions)	1088	1.24	1088	1088	1088
Refused Respondent - HARD Female (no questions)	1405	1.60	1405	1405	1405
Engaged	141	0.16	-	141	-
No Answer	1675	1.90	-	1675	-
Answering machine-sounds like a residence	675	0.77	675	675	-

Table 7. Survey response rates and consent rates for the epidemiological study of problem gambling (July-October 2008)

Description of call statistics[a]	N	% of total RDD numbers dialled	Qualifying numbers considered 'in-scope'[b] and hence used in the calculation below are indicated		
			Less conservative method for response rate calculation	More conservative method for response rate calculation	Survey consent rate
Answering machine-can't tell if home or business	25	0.03	25	25	-
Complete	15000	17.04	15000	15000	15000
Arrange Call-back	2800	3.18	-	2800	-
Soft appointments	362	0.42		362	
Hard Appointments	239	0.27	-	239	-
Non-qualifier-Away duration	1	0.00	-	-	-
Cognitively impaired	113	0.13	113	113	-
No-one 18yrs OR over 18yrs in household	291	0.33	-	-	-
Non-qualifier-Lives outside VIC	61	0.07	-	-	-
Non-qualifier-Under 18	14	0.02	-	-	-
Hearing impaired	130	0.15	130	130	-
Answering Machine	1	0.00		1	-
Multiple land lines	99	0.11	-	-	-
Out of scope number - business	4733	5.38	-	-	-
Fax Machine	2918	3.32	-	-	-
Disconnected - Telstra message	34927	39.68	-	-	-
Disconnected	53	0.06	-	-	-
Call cycle dead after more than 10 attempts	10444	11.86	-	-	-
Total sample items (RDD numbers)	88022	100.00	28489	34481	25265
Percentages for response rates and consent rate			52.65%	43.50%	59.37%

a. Note that hard refusals are obvious refusals where the respondent states a firm position to not want to participate in the study (eg. becomes angry or verbally states a definitive 'no'). Soft refusals, in contrast, may be where the respondent is 'a bit busy at the moment' (or similar) and there is some indication that they may participate if circumstances had been different at the time (eg. Comments such as - It's sounds interesting, but I'm just a bit busy too busy at the moment).

b. In-scope refers to the numbers that can be counted as qualifying for the epidemiological study.

Interpreting results and trends in the epidemiological study

In reading the report findings, readers may wish to note the following pointers, which will help with any technical issues encountered in interpreting statistical information contained in the report.

Significant trends

Significance testing involves a range of statistical methods to identify what are termed 'statistically significant' differences and trends in data. Such methods allow a test of the probability of two groups being the same or an association occurring between two variables. For instance, this may assist to inform research questions of interest such as:

- Do problem gamblers significantly differ from non-problem gamblers on income?
- Is there a statistically significant relationship between education level and risk for problem gambling?

A statistically significant result suggests that the theoretical chance of two groups being the same (or a trend not occurring) is very low probability (with the probability indicated through a p value). For instance, a p<.05 indicates that the theoretical chance of two groups being the same is less than 5%. While only a theoretical basis, it provides some indication of the likelihood that a trend is 'real' (although is by no means a guarantee).

Odds ratios

Odds ratios (OR) are presented in many sections in the report. Frequently used in epidemiological studies, odds ratios present a method for comparing the odds of a certain event between two groups (eg. in the survey, groups such as non-problem and problem gamblers may be compared). Both binary and ordinal logistic regression were frequently used for significance testing.

An odds ratio of 1 implies that a result is equally likely in both groups. An odds ratio greater than one implies that the event is more likely in the second group compared to the 'reference group'. An odds ratio less than one implies that the result is less likely in the second group (compared to the reference group).

Odds ratios in the current report have been presented to allow identification of general trends in data at a top line level. While it is possible that odds ratios could be adjusted for a wide range of covariates (eg. age, gender, income, education level, psychological distress, alcohol use etc.)
(ie. covariates are essentially factors which may also in part explain trends), adjustments to odds ratios have not been conducted at this stage. However, it is acknowledged that a detailed study of covariates would present an interesting additional type of analysis.

Other significance testing

In addition to odds ratios, other minor types of statistical significance testing was also conducted depending on the nature of the data (eg. t-tests, F tests derived from ANOVAs). While p values broadly imply the same interpretation (ie. p<.05 or lower implies statistical significance), readers are primarily encouraged to understand how to interpret odds ratios, as this will assist with the appreciation of most study findings.

Pointers for readers

In summary, this implies that, from the reader's perspective, major points to note are:

STATISTICAL SIGNIFICANCE
p<.05 or lower all imply statistical significance - this means that the result is worth noting and may be an interesting trend.

ODDS RATIOS
Odds ratios (OR) indicate the probability of an event occurring with:

- Odds ratios - Less than 1 imply that an event is less likely to occur
- Odds ratios - More than 1 imply that an event is more likely to occur

(based on a comparison of one group with another group)

Standard error and confidence intervals

In the report, standard error and confidence intervals are provided. It should be noted that:

- The standard error of a statistic is a measure of the 'impreciseness' of a statistic in representing the real population value
- Confidence intervals define a band around a statistic which is likely to contain the true population value - 95% confidence interval means that we can be 95% certain that the population value (eg. mean, proportion) lies within the band

Statistical software

Findings in the study were analysed using Stata statistical package. This included ensuring that correct strata were defined in the data prior to analysis. Where possible, all significance tests were limited to the Stata survey 'svy' module to ensure the correct calculation of standard errors and confidence intervals (using a single-stage design).

This ensured that variance calculations needed to compute standard errors and confidence intervals took account of the 23 EGM spend strata in the project, the sampling weights and the primary sampling unit (which in effect was the respondent).

Report structure

Key findings of the epidemiological study are structured in line with following report sections:

- Participation in gambling by Victorian adults
- Prevalence of problem gambling
- Profile of problem gambling risk segments
- Comparison of problem gambling risk segments
- Results relating to the highest-spend gambling activities of Victorian adults
- Responsible gambling practices of gamblers
- Problem gambling from a public health perspective
- Recognition of at-risk gambling and reported help seeking
- Problem gambling in families and friends
- Emergence of problem gambling throughout the life span
- Help seeking for problem gambling
- Tables for reference
- Appendix