GAMBLING & ADDICTIONS RESEARCH CENTRE
NATIONAL INSTITUTE FOR PUBLIC HEALTH & MENTAL HEALTH RESEARCH
AUT UNIVERSITY

OFFSHORE GAMBLING BY NEW ZEALANDERS STUDY

Provider Number: 467589

Agreement Number: 353536/00

FINAL REPORT

11 September 2015

Prepared for:
Ministry of Health
PO Box 5013
Wellington

Authors:
Dr Maria Bellringer
Dr Nick Garrett
Dr Komathi Kolandai-Matchett
Professor Max Abbott

ACKNOWLEDGEMENTS

This report has been prepared by the Gambling and Addictions Research Centre, National Institute for Public Health and Mental Health Research, School of Public Health and Psychosocial Studies, Faculty of Health and Environmental Sciences, Auckland University of Technology, Private Bag 92006, Auckland 1142, New Zealand.

The authors would like to thank Dr Sally Gainsbury who peer reviewed this report and provided some very useful comments and suggestions.

The study was funded by the New Zealand Ministry of Health.

Disclaimer

CONTENTS

LIST OF TABLES

LIST OF FIGURES

EXECUTIVE SUMMARY

This report presents and discusses results of secondary analyses of the New Zealand National Gambling Study (NGS) data related to past year offshore gambling participation and expenditure, and associated risk factors. Offshore gambling is defined as gambling that is conducted in a country other than New Zealand (NZ) and can physically occur at a venue (whilst a NZ citizen is visiting the overseas country) or by remote interactive means via telephone, internet (e.g. through a desktop computer, laptop, iPad, iPhone or any other handheld device) or interactive television[1] (whilst physically situated in NZ). Data from the first three years of the NGS (Wave 1 - 2012, Wave 2 - 2013 and Wave 3 - 2014) were analysed. Offshore internet/remote interactive gambling (referred to as offshore online/remote gambling) was compared with local (i.e. New Zealand-based) internet/remote interactive gambling and land-based (i.e. at a venue) gambling. There was a specific, but not exclusive, focus on sports and horse/dog race betting.

In brief, the NGS comprised a randomly selected national sample of 6,251 people aged 18 years and older living in private households who were interviewed face-to-face in 2012 (Wave 1). The response rate was 64% and the sample was weighted to enable generalisation of the findings to the New Zealand adult population. Wave 2 was in 2013 when 3,745 participants were re-contacted and re-interviewed. Due to budgetary constraints, attempts were only made to re-contact 5,266 of the original 6,251 participants; a 71% response rate was achieved. Wave 3 took place in 2014 with 3,115 participants re-interviewed (83% response rate).

The survey instrument covered 12 key areas:

1. Leisure activities and gambling participation
2. Past gambling and recent gambling behaviour change
3. Problem gambling (including help-seeking behaviours and gambling in households)
4. Life events and on-going hassles
5. Attitudes to gambling in New Zealand
6. Mental health (general psychological distress, quality of life)
7. Alcohol use/misuse
8. Substance (tobacco, other drugs) use/misuse
9. Health conditions
10. Social connectedness
11. New Zealand Individual Deprivation Index
12. Demographics.

Full methodological details for the NGS are reported elsewhere (Abbott, Bellringer, Garrett & Mundy-McPherson, 2014a).

Only gambling modes where it was possible to participate both within New Zealand and offshore and/or where online or other remote interactive gambling were possible, are included in this report. These were commercial poker gambling; lotteries/raffles gambling; Lotto and keno gambling; land-based casino gambling; horse/dog race betting and sports betting at an event, physically at a TAB[2], online/remotely with the New Zealand TAB or online/remotely with an offshore TAB or betting organisation/exchange; and other offshore online gambling.

Strengths of this study are the good response rates over the three years of data collection, analysis of data from the same participants over time and the ability for subgroup analyses to be conducted, particularly for New Zealand Lotto/keno gambling, and overall horse/dog race

[1] As offshore gambling was not the primary focus in the design of this study, there are some inconsistencies and differences in the way offshore gambling questions were worded.
[2] Totalisator Agency Board.

and sports gambling. However, data for offshore online/remote horse/dog race and sports betting, offshore online commercial poker gambling and other offshore online gambling are limited by small sample size. For lotteries/raffles gambling, offshore online gambling is inextricable from offshore land-based gambling[3].

Results

The following results should be treated with caution and considered indicative rather than absolute due to small sample sizes and, in some cases, overlapping confidence intervals for many of the subgroups investigated. Key results for horse/dog race and sports betting have been italicised and key results for offshore gambling have been underlined.

Gambling participation

Online/remote interactive gambling both within New Zealand and on offshore sites is participated in by only a small percentage of the population and over the three years of the study generally declined for the different modes of gambling, with the exception of Lotto online in New Zealand which increased over time. Overall, the prevalence of offshore online/remote gambling was 1.7%, 1.2% and 0.9% for 2012, 2013 and 2014 respectively[4]. The most common mode of online gambling was Lotto on the New Zealand MyLotto website (5%, 6% and 8% for 2012, 2013 and 2014 respectively[5]). New Zealand TAB online gambling (horse/dog race betting and sports betting combined) was 3.7%, 2.9% and 2.7% whilst the prevalence of gambling at an offshore TAB/betting organisation/exchange either online or by other remote interactive means was more stable at 0.7%, 0.5% and 0.6% (horse/dog race betting 0.4%, 0.3% and 0.4%; sports betting 0.4%, 0.2% and 0.2%). The declining trend in participation was also noted for horse/dog race and sports gambling overall (in-venue, at event and online) at 14%, 12% and 11% for each year respectively.

In Wave 1 (2012), no horse/dog race bettors gambled exclusively via offshore online/remote methods and only 2% of sports bettors did so. Only 5% of horse/dog race bettors and 7% of sports bettors gambled exclusively online/remotely via the New Zealand TAB. *The majority of horse/dog race and sports bettors gambled online as an adjunct to betting at a New Zealand TAB venue or track event*.

A similar finding was noted for Lotto gambling with only 2% of Lotto participants exclusively buying tickets online (NZ) and 6% buying online plus from stores (NZ). However, for keno and poker, higher percentages for exclusive online gambling or online plus land-based gambling were noted. Of keno gamblers, 18.5% exclusively gambled online (NZ) and 5.5% gambled both online and via land-based means (NZ). The respective percentages for poker gamblers were 6% (offshore) and 18.5% (offshore online and NZ land-based combined). These percentages were similar to the prevalence for casino gamblers with 18% gambling exclusively at offshore (land-based) venues and 14% gambling both at offshore and New Zealand land-based venues. These appear to be modes of gambling where physical venue access is more restricted, particularly in regard to locations of casinos and commercial poker venues.

[3] Offshore gambling was not the primary focus in the design of the National Gambling Study.

[4] This excludes gambling online on overseas lotteries as the question was phrased as buying "a ticket in an overseas raffle or lottery (includes tickets bought in an overseas shop, by telephone, through the post, or online)".

[5] This corresponded with Lotto NZ annual reports which detailed that MyLotto sales were 4.7% of sales in 2011/12, 6.2% in 2012/13 and 7.5% in 2013/14.

Sociodemographic characteristics of participation

A higher proportion of males participated in sports betting (about three-quarters, via all modes of access not just online), horse/dog race betting (70%, NZ online; 60% physically at a TAB) and in commercial poker gambling (86%, offshore online; 82% NZ land-based). A gender difference was less noticeable for lotteries/raffles participation, Lotto and keno participation, casino gambling and other offshore online gambling[6].

Younger adults comprised the largest proportion participating in sports betting (about three-quarters, 18-44 years, via all modes of access not just online), commercial poker gambling (about three-quarters, 18-34 years, offshore online and NZ land-based) and other offshore online gambling (90%, 18-44 years). *This was not the case for horse/dog race betting offshore online/remotely with a greater participation (61%) amongst the 45-64 year age groups*. The youngest age group (18-24 years) comprised the smallest proportion (< 10%) who participated in NZ Lotto gambling.

For all modes of gambling analysed, the greatest participation was by European/Other participants (about 60% or greater) with much lower participation by other ethnicities. Generally, there did not appear to be specific ethnic preferences for online compared to land-based modes of participation.

Participation and gambling behaviour

A majority of the participants (52% - 71%) appeared to gamble infrequently on online or land-based gambling. The exceptions were for offshore online commercial poker gambling where a greater percentage were regular continuous gamblers (53%), keno gambling with 26% of in-store gamblers and 21% of online (NZ) gamblers being regular continuous gamblers, and for *online (NZ and offshore) horse/dog race betting where there was a more even spread amongst infrequent gamblers (47% NZ; 39% offshore), regular non-continuous gamblers (17%; 25%) and regular continuous gamblers (both 36%).*

A majority of participants (67% - 95%) had typical monthly expenditure on gambling in the higher range (usually $51 or higher) for all modes of gambling examined apart from raffles/ lotteries and Lotto which showed a more even spread of monthly expenditure. There were no major differences between land-based and online modes of gambling although online raffles/ lotteries (offshore) and Lotto (NZ) gamblers tended to have slightly higher typical monthly expenditure than did land-based counterparts.

A majority of the participants across the modes of gambling examined were non-problem gamblers or low-risk gamblers (72% - 97%). However, there were exceptions for two modes of gambling. A greater proportion of offshore online commercial poker players were categorised as problem gamblers (13.8%) compared to New Zealand land-based poker players (3.7%) and 11.9% of other offshore online gamblers were problem gamblers.

Associated factors for offshore or online/remote gambling

Problem gambling severity was not associated with either higher or lower likelihood for participating online or remotely on any mode of gambling in comparison with participating in the equivalent land-based mode of gambling.

[6] 'Other offshore online gambling' relates to online gambling on the following: casino games and EGMs (not cards), bingo, event betting, skill games, virtual sport and other non-specified gambling.

Being a migrant (vs. NZ born) was associated with *greater likelihood* (OR 2.6) for gambling on *offshore online/remote horse/dog race and sports betting combined* vs. gambling on New Zealand land-based equivalents (horse/dog race or sports gambling at an event or TAB). Being a migrant was also associated with greater likelihood for gambling on offshore (land-based and online) raffles/lotteries (OR 9.1) and New Zealand Lotto online through the MyLotto website (OR 1.8) vs. gambling on New Zealand land-based equivalents of those modes of gambling.

Having higher average monthly gambling expenditure (> $500 vs. $1-$10) was associated with *greater likelihood* (OR 13.3) for gambling on *offshore online/remote horse/dog race and sports betting combined* vs. gambling on New Zealand land-based equivalents (horse/dog race or sports gambling at an event or TAB). Similarly, higher average monthly gambling expenditure ($101+ vs. $1-$10) was associated with *greater likelihood* (OR ≥ 11.6, increasing with increasing expenditure) for gambling on *online/remote horse/dog race betting (NZ and offshore combined)*. Higher average monthly gambling expenditure ($31+ vs. $1-$10) was also associated with greater likelihood for New Zealand Lotto online gambling (OR ≥ 4.5, increasing with increasing expenditure).

Other associations with greater likelihood for online/remote gambling included gambling on a higher number of activities, for gambling on offshore raffles/lotteries (land-based and online, 3+ activities vs. 1-2, OR ≥ 3.2) and gambling in offshore casinos (land-based, 7+ activities, OR ≥ 7.0). The likelihood was greater for gambling in this way compared with New Zealand land-based gambling with increasing likelihood the more activities participated in. Participants who were unemployed (vs. employed, OR 15.1) or who had a lower quality of life (below median vs. above median, OR 8.4) had greater likelihood for gambling on commercial poker via offshore online sites than gambling within New Zealand at venues.

Being religious (vs. non-religious) was associated with *lower likelihood* for gambling on *online/ remote (NZ and offshore combined) horse/dog race* (OR 0.6) and *sports betting* (OR 0.4) compared with land-based gambling. Being religious was also associated with lower likelihood for participating in offshore online commercial poker gambling (OR 0.1) compared with New Zealand land-based commercial poker gambling.

Ever having smoked more than 100 cigarettes in their lifetime (vs. not having done so) was associated with *lower likelihood* (OR 0.5) for participating in online/remote sports betting (NZ and offshore combined) vs. gambling on New Zealand land-based equivalents (at an event or TAB). Ever having smoked was associated with lower likelihood for participating in offshore raffles/lotteries (land-based and online, OR 0.6) and New Zealand Lotto online (OR 0.7), and participants who smoked at least weekly had lower likelihood (OR 0.5) for participating in offshore casino gambling (land-based).

Ethnicity was not an associated factor for any mode of offshore or online/remote gambling in comparison with gambling on the equivalent land-based mode, with the exception of New Zealand online Lotto participation for Pacific people who had lower likelihood (OR 0.3) compared to Pacific in-store Lotto participants.

Expenditure

Total population self-reported annual expenditure on online gambling in New Zealand was $133.7 million, $128.1 million and $132.4 million in 2012, 2013 and 2014 respectively. For offshore online gambling, the amounts were $47.6 million, $14.6 million and $36.2 million respectively.

The corresponding total population annual expenditure on horse/dog race and sports betting online with the New Zealand TAB in 2012, 2013 and 2014 was $81.7 million ($66.0m horse/dog; $15.8m sports), $62.1 million ($48.6m; $13.5m) and $45.9 million ($34.5m; $11.3m). For offshore online horse/dog race and sports betting, the amounts were $19.4 million ($8.0m horse/dog; $11.4m sports), $5.9 million ($3.0m; $2.8m) and $6.9 million ($3.6m; $3.3m) respectively.

These annual total population expenditure estimates have been derived from self-reported data which have inevitably included some level of recall bias and thus will not directly match actual expenditure figures. However, the NGS self-reported expenditure on horse/dog race and sports betting overall was comparable to official Department of Internal Affairs expenditure in the three years examined, giving confidence in the NGS data.

Median monthly expenditure per participant was higher on horse/dog race betting compared to sports betting. For example, in Wave 1, overall median monthly expenditure on horse/dog race and sports betting combined (land-based and online) was $25; the median was $22 for horse/dog race betting and $17 for sports betting. Median expenditure on horse/dog race betting online/remotely when gambling with the New Zealand TAB was similar to that when gambling with offshore TABs/betting organisations ($16 vs. $17). For sports betting, the median monthly expenditure was $9 online/remotely via New Zealand TABs vs. $8 with offshore TABs/betting organisations. *Overall, median monthly expenditure on horse/dog race and sports gambling combined, in Waves 2 and 3, appeared to be relatively stable with a slight increase in overall offshore online/remote expenditure*.

In Wave 1, the highest median monthly expenditure (excluding horse/dog race and sports gambling) was for overall (land-based NZ and offshore) casino gambling ($28) followed by New Zealand housie/bingo and other offshore online gambling (both $19) then commercial poker (land-based and online) and land-based pub/club electronic gaming machine (EGM) gambling (both $18). Expenditure increased in Waves 2 and 3 for casino gambling, housie/bingo and poker gambling in a private residence. A reduction in median monthly expenditure for other offshore online gambling was noted over time. Median expenditure increased in Wave 2 for commercial poker then subsequently reduced again in Wave 3; this finding is probably misleading and is likely due to very small samples with skewed results. New Zealand Lotto expenditure remained relatively stable in all waves.

Transitions into and out of online/remote gambling participation over time

For horse/dog race gambling or sports betting online/remotely (NZ and offshore combined) or offshore online/remote gambling overall, there was fluctuation in people moving into and out of gambling on those modes. A majority of online gamblers who took up participation in Wave 2 or Wave 3 were horse/dog race or sports gamblers from land-based modes rather than people who participated in other modes of gambling.

For New Zealand online Lotto gamblers, generally past-year gamblers continued to gamble over the three years of the study, with only a minority stopping gambling at each wave. For non-online Lotto gamblers in Wave 1 who took up online Lotto gambling in Wave 2, a majority continued online gambling in Wave 3. This trend was similar to that seen for overall gambling participation.

Online horse/dog race and sports gambling total population and expenditure estimates

In 2014 (Wave 3), almost 100,000 people (96,334) participated in online gambling with the New Zealand TAB. Online gambling with an offshore TAB/betting organisation was a fifth of that number (19,865). *Online TAB/betting organisation gamblers were a quarter (26%) of the New Zealand online gambling population and almost two-thirds (61%) of the offshore online gambling population.*

The corresponding total population expenditure estimates for 2014 were $45.9 million for New Zealand online TAB gambling and $6.9 million for offshore online TAB/betting organisation gambling. *Online TAB/betting organisation gamblers comprised about one-third (35%) of the New Zealand online gambling expenditure and about one-fifth (19%) of the offshore online gambling expenditure.*

Reasons for differences between surveys

The NGS results presented in this report for offshore gambling participation and expenditure are substantially lower than results in the 2010 and 2015[7] 'Online Gambling Survey' reports published by Nielsen for the New Zealand Racing Board and, in some cases, slightly lower than preliminary results from the 2014 Health and Lifestyle Survey.

There are several reasons for these differences including survey methodology (e.g. the population sampled and processes for sampling, recruitment time frame), response rates, and how the questions are asked (different wording can lead to different responses and recall bias).

Summary of key horse/dog race and sports betting findings

The evidence from this nationally representative National Gambling Study indicates that internet gambling is not currently a growing problem. Online/remote gambling both within New Zealand and on offshore sites is participated in by a very small percentage of the population and, over the three years of the study, the trend appeared to be a decline, with the exception of gambling on New Zealand Lotto online. Despite the convenience of gambling by online or remote interactive methods, horse/dog race and sports gamblers generally were more likely to physically visit a New Zealand venue (race/track event or TAB) to place their bets. Similarly, the percentage of people seeking help from full intervention services for problems with online/remote gambling was very low (less than 3% both for offshore and NZ, and less than 5% overall). The highest percentage was in 2014 due mainly to slightly higher New Zealand-based and offshore online/remote gambling (particularly horse/dog race and sports betting, and offshore casino EGM gambling) in that year compared with previous years.

Males were more likely to participate in sports betting (via all modes of access not just online), and horse/dog race betting (NZ online and physically at a TAB), with younger age groups more likely to participate in sports betting (via all access modes). The opposite was noted for offshore online/remote horse/dog race betting where the greatest proportion were aged 45 to 64 years. European/Other participants comprised the greatest percentage gambling on all modes of horse/dog race and sports gambling. No other major differences were noted between land-based and online/remote horse/dog race and sports gamblers.

Some factors associated with higher online/remote (NZ and offshore combined) horse/dog race and sports gambling including being a migrant and having a higher total monthly gambling

[7] Preliminary findings only.

expenditure. Associated with lower online/remote (NZ and offshore combined) horse/dog race and sports gambling were being religious and smoking tobacco. Ethnicity was not associated with higher or lower online/remote (NZ and offshore combined) horse/dog race and sports gambling.

Median monthly expenditure on horse/dog race betting was higher than for sports betting. Overall median expenditure on offshore online/remote gambling on horse/dog race and sports betting combined slightly increased over time. This was not noted for New Zealand online/ remote horse/dog race and sports betting combined.

There was some fluctuation in people transitioning into and out of horse/dog race and sports gambling over time and a majority of the online gamblers who took up online participation were already land-based horse/dog race and sports gamblers.

Conclusions

In conclusion, online gambling participation remains a very small proportion of gambling behaviour despite the increase in internet accessibility, and online gambling expenditure is substantially less than expenditure on land-based modes of gambling. Offshore online gambling occurs to a much lower extent than New Zealand-based online gambling. Online gambling appears to be an adjunct to gambling on the same modes by more traditional land-based means, with a very low percentage of adults gambling solely online. New Zealand seems to have a lower prevalence of internet gambling than some other Western countries which means that currently only a relatively small proportion of New Zealand funds (and potential tax revenue) is being 'lost' overseas. However, from a policy point of view, it will be important to monitor the situation and assess changes over time as ownership of mobile internet-capable devices increases and as ultra-fast broadband access becomes more widely available.

It is of note that there were higher proportions of problem gamblers amongst offshore online commercial poker players and other offshore online gamblers[8]. Although the percentages of the adult population taking part in these forms of online gambling were very small, this finding has implications for public health and intervention provision, particularly in regard to people who might transition into online modes from gambling on land-based activities.

[8] Other offshore online gambling relates to online gambling on the following: casino games and EGMs (not cards), bingo, event betting, skill games, virtual sport and other non-specified gambling.

1 BACKGROUND

The New Zealand National Gambling Study (NGS) is a nationally representative longitudinal survey of adults aged 18 years and older, providing information on the prevalence, nature and effects of gambling in New Zealand. Face-to-face household recruitment was used with data collected via computer-assisted personal interviews (CAPI). The NGS commenced in 2012 (Wave 1) and followed the same participants over time. The baseline (Wave 1) sample comprised 6,251 adults. It was a multi-stage, stratified, probability proportional to size sample with over-sampling of Māori, Pacific people and Asians. Wave 2 re-interviewed 3,745 participants 12 months after the initial interview and 3,115 participants were re-interviewed in Wave 3 (two years after initial interview).

The NGS survey instrument incorporated a range of measures including gambling participation and expenditure, gambling strategies and cognitions, gambling attitudes, problem gambling, health and well-being, psychological status, readiness to change, substance use/misuse, life events, social capital/support and demographic information. The data included questions pertaining to past year gambling accessed in various ways (where relevant) such as land-based in New Zealand and offshore (i.e. in a country other than New Zealand) and online/remotely in New Zealand and offshore[9] (whilst being situated in NZ). The main focus of the present study (secondary analyses of the NGS data) was to examine offshore gambling (land-based and online/remote interactive) in comparison to New Zealand land-based and online/remote interactive modes of access. The offshore gambling questions[10] related to:

- Buying a ticket in an overseas raffle or lottery (includes tickets bought in an overseas shop, by telephone, through the post or online)
- Playing poker for money or prizes online (e.g. via the internet through a personal computer, laptop, iPad, iPhone or any other handheld device) or interactive television
- Betting on horse or dog races through an overseas Totalisator Agency Board (TAB) or other overseas betting organisation or website
- Betting on sporting events through an overseas betting organisation or an overseas TAB by telephone, online (e.g. via the internet through a personal computer, laptop, iPad, iPhone or any other handheld device) or interactive television
- Played table games or electronic gaming machines at an overseas casino (in person)
- Other online gambling for money:
    - Bet on an event through an overseas website (e.g. on an election result or television show)
    - Played online casino games other than card games (e.g. roulette)
    - Played internet bingo
    - Played skill games online (e.g. chess, scrabble, mah-jong, bridge, backgammon)
    - Placed a bet on a virtual race or sports event
    - Participated in any other gambling or lottery activity (e.g. gaming machines or instant games) online through an overseas website for money.

[9] As offshore gambling was not the primary focus in the design of this study, there are some inconsistencies and differences in the way offshore gambling questions were worded.

[10] The wording here is the same as in the questionnaire though the questions were usually prefaced with a past 12 month qualifier.

Additionally, data were collected for past year New Zealand-based internet/remote interactive gambling[11] participation and expenditure, specifically:

- Buying Lotto tickets online from the MyLotto website
- Buying keno tickets online from the MyLotto website
- Betting on horse or dog races through the New Zealand TAB by telephone, online or SKYbet interactive television
- Betting on sporting events through the New Zealand TAB by telephone, online or SKYbet interactive television.

Previous analyses conducted for the main National Gambling Study reports have only detailed overall participation percentages for each offshore/internet gambling mode detailed above. More detailed examination was limited to 'other online gambling' with the other modes of offshore and New Zealand internet gambling collapsed into broader categories which included local land-based gambling.

Recently, a Ministerial working group "The offshore racing and sports betting working group" was established to address the issues of offshore betting by New Zealanders with local industry losing associated revenue to overseas organisations. The group is interested in understanding:

- The prevalence of offshore gambling and associated expenditure for the different modes of gambling
- Aggregated number of participants betting on offshore horse/dog races and sports
- Differences in risk factors between offshore gambling, including online gambling, and local gambling (in-venue and online) with greater emphasis on horse/dog race and sports betting
- A review of existing evidence and surveys relating to offshore gambling.

Consequently, the aim of the current study is to conduct and report supplementary analyses of the National Gambling Study offshore and online/remote interactive gambling data over the three years (2012, 2013 and 2014) to provide the working group with sufficient information to assist in their purpose.

Only gambling modes where it was possible to participate both within New Zealand (NZ) and offshore and/or where online or other remote interactive gambling[12] were possible, are included in this report. These were commercial poker gambling; lotteries/raffles gambling; Lotto and keno gambling; casino gambling; horse/dog race betting and sports betting; and other offshore online gambling. Throughout this report, reference to 'other offshore online gambling' relates to online gambling on the following: casino games and EGMs (not cards), bingo, event betting, skill games, virtual sport, raffle/lottery and other non-specified gambling.

[11] Online/remote interactive gambling in New Zealand is restricted to Lotto and keno gambling via the MyLotto website and to horse/dog race and sports betting via the New Zealand TAB. Other modes of gambling conducted online are with offshore websites.

[12] This could be by telephone, interactive television or through the post.

2 LITERATURE REVIEW

Participation in online gambling is relatively new compared to traditional land-based or in-person gambling modes. In the 1990s, with the introduction of the World Wide Web, now simply referred to as the internet, gamblers gained access to a whole new arena of gambling opportunities. The internet now offers gamblers a broad range of online gambling activities such as horse/dog race and sports betting, poker, electronic gaming machines and casino type games - electronic formats of gambling activities provided in land-based gambling venues.

This review summarises key findings from national surveys between 1999 and 2012 to provide an overview of *online offshore gambling* in New Zealand. This review also includes key points from the international literature of relevance to *internet gambling* in general and *offshore online gambling* in specific. These terminologies are clarified in Section 2.2.

2.1 Literature review methodology

A focused search on official websites was carried out to obtain final published reports on relevant national surveys between 1999 and 2012. Findings from the following national surveys were included in this review:

- New Zealand Health Surveys (NZHS) (Ministry of Health, 2006; 2009; 2012[13])
- Health and Lifestyle Surveys (HLS) (Devlin, 2011; Gray, 2011; HSC, 2010)
- Gaming and Betting Activities Survey (GBAS) commissioned by the Health Sponsorship Council (Health Sponsorship Council, 2007)
- People's Participation in, and Attitudes to, Gambling Surveys (PPAGS) commissioned by the Department of Internal Affairs (Department of Internal Affairs, 2008)
- National Gambling Study (NGS) surveys commissioned by the Ministry of Health (Abbott, Bellringer, Garrett & Mundy-McPherson, 2014a; 2014b).

Additionally, findings from industry-commissioned surveys implemented by market research companies (Colmar Brunton, 2010 as cited in NZ Lotteries, 2012; Nielsen, 2010) were also included in this review.

To obtain relevant international literature, a search was carried out in June 2015 using several electronic databases (e.g. Ovid, Springer Link) and the search engine Google Scholar. Search terms used included "interactive gambling", "online gambling", "internet gambling", "iGambling", "remote gambling" and "offshore gambling".

2.2 Existing terms and clarification of terms used within the context of this study

In the New Zealand Gambling Act and Gambling Amendment Act, *remote interactive gambling* is defined as "gambling by a person at a distance by interaction through a communication device" (New Zealand Government, 2013, p. 31) or the conduct of such a gambling activity by a person (New Zealand Government, 2015, p. 9). *Remote interactive gambling* includes internet-based gambling as well as gambling using a telephone (including text messaging) and interactive television (Department of Internal Affairs, 2008).

The abbreviated terms *remote gambling* and *interactive gambling* are used interchangeably in the literature. The term *interactive gambling* may be used on its own as an overarching term which includes a range of gambling activities that occur through interactive communication

[13] Preliminary data only.

media such as the internet, telephone or digital television (Commonwealth of Australia, 2009). Similarly, *remote gambling* is defined in the British Gambling Act 2005 as gambling through "remote communication including: the internet, telephone, television, radio" or "any other kind of electronic or other technology for facilitating communication" (Gambling Commission, 2015a). The word 'remote' in this definition relates to gambling services provided via 'remote' communication as well as the use of 'remote' gambling equipment (Gambling Commission, 2015a). In this sense, the term 'remote' is referring to remote access or remote technology. *Remote gambling*, however, includes services located locally and abroad (Ranade, Bailey & Harvey, 2006).

The adjective 'remote' also means located far away; therefore, the term *remote gambling* could be used in reference to subscription of remote gambling services provided by offshore operators and may thus be mistakenly assumed as synonymous to the terms *offshore gambling* and *overseas gambling*. Potentially adding to the confusion, *offshore* or *overseas gambling*, in general, could include gambling in land-based gambling facilities overseas.

In some studies (e.g. Wood & Williams, 2007a), the term remote gambling is distinguished from internet gambling. However, the term *interactive gambling* may simply refer to gambling using a medium connected to the internet, and is thus used interchangeably with *internet gambling* or *online gambling* (Gainsbury, 2012; Hing et al., 2014). Synonymous terms for internet gambling noted in the literature included *wireless gambling* (Monaghan, 2008) and *cyber-gambling* (Rrychlak, 2011).

Interactive gambling is regarded as a somewhat wider term which includes remote gambling methods using digital technological devices (Gainsbury, 2012). *Interactive gambling* is also considered a wider term as it includes both internet-based gaming and wagering (Hing et al., 2014). In Australia, *online wagering* which involves race and sports betting is legal while *online gaming*, which involves internet-based casino or poker machine games, is illegal (Parliament of New South Wales, 2014). The internet and other interactive devices are used:

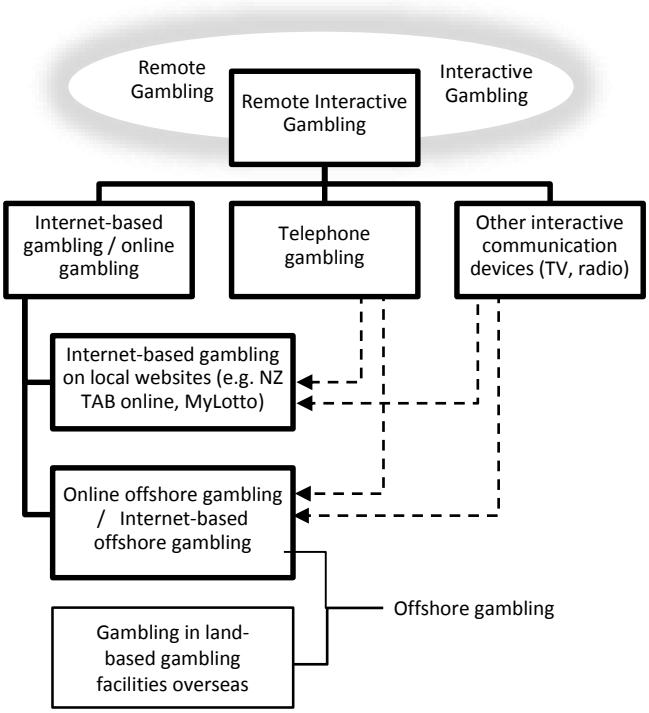
(a) To offer consumers gambling services
(b) To enable users to bet or gamble against other users (e.g. through online poker)
(c) As a sales distribution channel (e.g. enabling users to purchase lottery tickets online) (Gainsbury, 2012).

In New Zealand, with the exception of online gambling products and services offered by the New Zealand Racing Board and the Lotteries Commission, all other provision of *remote interactive gambling* is prohibited under the New Zealand Gambling Act 2003 (Department of Internal Affairs, 2008). However, using online gambling services provided by overseas operators is not illegal (Department of Internal Affairs, 2008).

Such differences from a legal perspective and the various features and uses of online gambling services suggest the need for clearly defined sub-categories of online gambling in future research. Considering the plethora of inter-related terms and some seemingly synonymous terms used in the literature, clarification of terms used in the present report appear vital.

In the context of the present review of literature, reference to *offshore gambling* is limited to *remote interactive gambling* as defined in the New Zealand Gambling Act 2003 and is focused on *internet-based offshore gambling* (see Figure 1). Remote devices such as smartphones, mobile phones, tablets and other communication devices with internet capabilities may generally fall as a sub-set within internet-based gambling. However, the use of such devices may be referred to more precisely as *mobile gambling* and is differentiated from 'traditional' internet gambling by the limitations to graphics on mobile phones and to payment transaction when games are not internet-based (Owens, 2010).

Figure 1: Online offshore gambling within the context of remote interactive gambling



To ensure language consistency, the term *offshore online gambling* is used throughout this report. The more generic terms, *internet gambling* or *online gambling*, are also used when citing items from literature in which those terms were used. It should be kept in mind that such generic terms may include both offshore online gambling and internet-based gambling on local websites.

2.3 Offshore online gambling prevalence

2.3.1 Offshore online gambling prevalence among New Zealanders

Table 1 provides a summary of findings on gambling participation from various surveys carried out in New Zealand between the years 1999 and 2012. Presented in this way, the table provides a rough overview of gambling prevalence across the different modes of gambling and across the years. This summary, however, should be interpreted with caution, as comparability strength was reduced due to differences in sample sizes, minimum age of participants, survey item descriptions and reporting methods.

The table does not provide a comprehensive summary of all data reported in the individual surveys. One-off unique items reported in some survey reports were not included as these were incomparable with other survey findings. Combinations of different gambling modes reported in some surveys, when different from the majority of other surveys, were also not included for similar reasons. For instance, the 2006/07 GBAS aggregated percentage estimate for betting on "horse or dog races and sports events" was not included in the table as most other surveys reported horse/dog race betting separately from sports betting. The GBAS combined percentage for lottery tickets which included "Lotto, Keno, Strike, Powerball, Big Wednesday, Instant Kiwi and other scratch tickets" and PPAGS combined percentage for "NZ raffle or lottery" were also not included in the table for similar reasons.

In some survey reports, different modes of gambling (e.g. local and offshore) were combined into a single category. For instance, NZHS reports provided an "other gambling activities" category which included "housie, table games or other games at a casino, overseas website gambling and other gambling activities". Such data were not included in the table.

Despite this cautionary approach to reduce incomparability, the generalised categories in Table 1 still need to be interpreted with caution as related items have been described variably in the surveys. For example, telephone gambling includes "games for money on a mobile" (HLS), "text game for money" (GBAS) and "0900 telephone gambling" (PPAGS). Such variability in survey item description was noted even for more common gambling activities. For instance, while Lotto is presented as a single category in the table below, questions on Lotto purchases contained varying details in the different surveys. Such differences reduce comparability across surveys.

Table 1: Gambling participation percentage by gambling activity in surveys conducted between 1999 and 2012

Gambling activity	PPAGS 1999 (N=6,452)	PPAGS 2000 (N=1,500)	NZHS 2002/03 (N=12,949)	PPAGS 2003 (N=12,929)	PPAGS 2005 (N=1672)	GBAS 2006/07 (N=1,973)	NZHS 2006/07 (N=12,488)	HLS 2010 (N=1,740)	Nielsen 2010 (N=1,206)	NZHS 2011/12 (N=9, 831)	HLS 2012 (N=2,672)	NGS 2012 (N=6,251)
Lotto	73	75	58.7	59	66	-	55.2	60	-	45.5	55.1	60.8
Keno/Bullseye	3	6	2.1	2	3	-	1.6	6	-	-	6.8	2.2
Housie/bingo	3	4	1.9	2	3	3	1.5	3	-	-	4	1.7
Instant Kiwi/scratch ticket	36	48	29.2	29	41	-	26.5	33	-	13.0	29.5	33.2
Raffle ticket/casino fundraising	48	67	-	-	55	52	-	43	-	-	33.9	47.1
Bets with friends/ workmates/family	17	24	-	-	22	10	-	29	-	-	-	15.3
EGM at pub/club	14	18	12.8	13	19	18	10.2	16	-	6.1	13.6	14.4
EGM at casino	11	14	-	-	10	8	7.7	10	-	3.9	10.7	8.4
Casino table games	5	6	8.3	-	4	3	2.1	3	-	-	7.4	3.9
Card games	3	5	-	-	4	-	-	-	-	-	-	4.5
Dice games	<1	2	-	-	<1	-	-	-	-	-	-	-
Track betting (horse/dog races)	18	17	11.3	11	14	-	8.7	12	-	8	14.7	12.1
Sports betting	5	8	4.2	4	4	-	5.2	4	-	-	7.9	4.9
Telephone gambling	3	3	<0.2	-	<1	2	-	<1	-	-	3.2	2.9
NZ MyLotto online (Lotto)	-	-	-	-	-	-	-	3.2	9.8	-	-	5.0
NZ MyLotto online (keno)								0.9				0.7
NZ TAB online	-	-	-	-	-	-	-	4.2	3.2	-	-	2.0
Internet gambling	<1	1	0.7	<1	<1	<1	0.4	-	-	-	-	-
Overseas internet gambling	-	-	-	-	-	-	-	2.1	3.6	-	1.4	0.7[#]
Overseas raffle/lottery	-	10	-	-	5	-	-	-	-	-	-	-
Overseas lotteries								0.2	0.6	-	-	-
Overseas online horse/dog race betting	-	-	-	-	-	-	-	0.2	-	-	-	0.4
Overseas online sports betting	-	-	-	-	-	-	-	0.3	-	-	-	0.4
Overseas online race or sports betting	-	-	-	-	-	-	-	-	0.7	-	-	-

[#] Overseas internet gambling = Not included in other overseas categories

In general, industry commissioned surveys provided a high level of prevalence estimates for offshore online gambling. As shown in Table 1, research by Nielsen (2010) indicated that 3.6% of New Zealanders engaged in offshore online gambling in 2010. In the same year, research

by NZ Lotteries indicated that 2% of New Zealand adults regularly engaged in overseas online gambling (Colmar Brunton, 2010 as cited in NZ Lotteries, 2012).

With the exception of the HLS 2010 survey (2.1%), other national surveys, HLS 2012 (1.4%) and NGS 2012 (0.7%) have indicated a relatively lower percentage of New Zealanders engaging in offshore online gambling. Earlier national surveys also recorded low percentages for internet gambling when compared to participation in land-based gambling modes. This implies that engagement in offshore online gambling would have been similar if not lower in those years.

Data in Table 1 indicate that online gambling using the MyLotto and New Zealand Totalisator Agency Board (TAB) websites were less popular than in-person gambling for related activities. Existing data do not enable reliable comparison with equivalent offshore online gambling as only a few national surveys have reported data for these sub-categories.

Offshore online lotteries, and sports and horse/dog race betting appear less prevalent than equivalent local land-based activities. However, these are only a tentative estimation of trends. In surveys that did not include an online category, respondents may have considered both online and land-based gambling activities they engaged in when providing responses.

Future national surveys should consider a greater level of precision in distinguishing between land-based and online gambling in general and between sub-categories of online offshore gambling if online gambling is to be further investigated. It is likely that online gambling and offshore online gambling will increase in popularity as interactive communication media become more accessible. The Department of Internal Affairs (2008) reported that in 2005 less than one percent of participants indicated a definite intention to engage in internet gambling in future and one percent indicated a probability of such engagement. Research by NZ Lotteries in 2010, found that five percent of those who had not previously engaged in offshore online gambling would consider this mode of gambling in future (Colmar Brunton, 2010 as cited in NZ Lotteries, 2012).

2.3.2 Online gambling: International prevalence trends

Gambling participation studies in other countries suggest a growth in online gambling (both local and offshore). A recent 2011 study in Australia (N=2,010) found that while there was an overall decline in gambling participation, there was an increase in the prevalence of interactive gambling and increase in engagement in both regulated and offshore sites among Australians (Gainsbury et al., 2015a). The study noted a prevalence rate of 8.1% for past-year participation in interactive gambling. Another earlier study in Victoria, Australia which provided gambling participation data from a random sample of 15,000 respondents in 2008 (Victorian Gambling Study) and a random sample of 8,479 respondents in 2003 (Victorian Longitudinal Attitudes Survey) found a 0.2% past year participation rate for internet casino betting in 2003 and 7.4% for phone competitions in 2008 (Abbott, Stone, Billi & Yeung, 2015).

Incidence rates of internet gambling from a longitudinal study in Sweden (N=8,165) indicated an increase in internet gambling prevalence from 8.6% in a baseline study (November 2008 to April 2009) to 13.3% in a follow-up study (December 2009 to March 2010) across all social demographic groups (Svensson & Romild, 2011).

In the United Kingdom, findings from the 2010 British Gambling Prevalence Survey (N=7,756) indicated that the prevalence of online gambling was 14% (Wardle, Moody, Griffiths, Orford & Volberg, 2011a; Wardle et al., 2011b). This percentage may have reduced in the following years. In a subsequent report on prevalence of gambling and problem gambling in Great Britain

which combined findings from the 2012 Scottish Health Survey (N=8,291 which included past year gambling participation data from 7,359 respondents) and the 2012 Health Survey for England (N=4,815 which included past year gambling participation data from 4,393 respondents), the prevalence reported for any past year online gambling (excluding the National Lottery) was seven percent (Wardle et al., 2014). Online gambling on slot machines, casino or bingo games was three percent, and online betting with a bookmaker was five percent.

To gain a clearer understanding of the characteristics, behaviours and motivations of internet gamblers, Wood and Williams (2009) carried out a telephone survey of 8,498 Canadian adults in 2006/07 and an international online survey of 12,521 adults from 105 countries in 2007. They found that in the Canadian sample, past year prevalence rate for internet gambling was 2.1% but that this rate was 3.5% when stock market gamblers were included. They also reported that although internet gambling remains the least common mode of gambling among Canadians, its prevalence has increased since 2004. In the international sample, prevalence of internet gambling varied significantly between countries "with higher rates occurring in European countries and the Caribbean, and lower rates occurring in North America, Asia, and Australia and New Zealand" (Wood and Williams, 2009, p. 85).

Online gambling is also likely to be gaining popularity in non-Western countries. For instance, a gambling participation survey in Singapore conducted in 2004/05 (N=2,004) reported a past year participation of 0.1% for online gambling (Ministry of Community Development, Youth and Sports, 2005). Surveys in 2007/08 (N=2,300), 2011 (N=3,315) and 2014 (N=3,000) noted that this percentage increased to, and stayed at, one percent in the following years (Ministry of Community Development, Youth and Sports, 2008; National Council on Problem Gambling, 2012; 2015).

2.4 Offshore online gambling expenditure

2.4.1 Consumer spending on offshore online gambling in New Zealand

At present, there are limited data providing expenditure estimates for offshore online gambling among New Zealanders. NZHS and HLS do not include gambling expenditure estimates for different gambling modes. The Department of Internal Affairs yearly gambling expenditure statistics do not split out data on online gambling and do not include offshore online gambling.

The PPAG surveys, the NGS surveys, and some industry commissioned surveys have included items that have enabled gambling expenditure estimates for specific gambling modes. However, stark variations in question wording, expenditure estimate methods, and reporting methods have removed the possibility of even a broad-brush comparison of reported findings (these are detailed in Section 2.8).

Findings from the aforementioned three sources are reported in the sub-sections below. Re-analysis of existing data would be required to enable a more reliable comparison between reported findings.

PPAG surveys

In the PPAG survey reports, annual expenditure is noted as providing indicative trends that should be treated cautiously (Department of Internal Affairs, 2008). This was due to expenditure figures being extrapolated from respondents' estimates of frequency and amount spent on different gambling activities.

PPAG expenditure estimates in Table 2 detail average annual expenditure as reported by respondents (i.e. all respondents in the survey) and by participants (i.e. weighted number of respondents who engaged in the respective gambling activities). The Department of Internal Affairs' estimates were that gambling expenditure increased for all gambling activities except for "Instant Kiwi/scratchies, internet gambling and sports-betting" between the years 2000 and 2005 (Department of Internal Affairs, 2008, p. 6).

Table 2: Participants'/respondents' reported average annual expenditure by activity

	2000		2005	
	Respondents ($)	**Participants ($)**	**Respondents ($)**	**Participants ($)**
Lotto	150	200	149	226
Non-casino gaming machines	98	542	96	517
Horse/dog betting NZ TAB	52	391	88	826
Instant Kiwi /scratchies	47	97	33	80
Casinos	44	280	32	286
Housie	14	385	19	602
Sports-betting NZ TAB	15	188	7	184
Keno	10	173	5	165
Internet gambling	2	183	4	719

Department of Internal Affairs, 2008, p. 30

NGS surveys

Table 3 provides the average typical monthly expenditure for the various types of gambling activities reported by NGS survey participants. To calculate monthly average expenditure for past year gambler participants for each activity, expenditure was totalled for all individuals in each group; this was then divided by the number of people who reported having engaged in that activity (Abbott et al., 2014a). Monthly average expenditure for all respondents was calculated by dividing expenditure by the total number of survey respondents (Abbott et al., 2014a).

Past year gambler participants reported higher monthly expenditure for gambling on card games, horse or dog races, overseas internet sites, casino table games, casino electronic gaming machines (EGMs), non-casino EGMs and sports games (Abbott et al., 2014a). Monthly expenditure was lower for housie or bingo, Lotto, keno, and betting with friends and workmates (Abbott et al., 2014a).

Table 3: Average typical monthly expenditure by gambling activity - past year participants and all respondents in each activity

	Typical total monthly expenditure $					
	Past year participants			All respondents		
Gambling activity	**Mean**	**(SD)**	**Range**	**Mean**	**(SD)**	**Range**
Cards for money	76.94	(285.68)	1 - 3,845	3.46	(59.43)	0 - 3,845
Bets with friends/workmates for money	11.21	(18.00)	1 - 200	1.71	(7.77)	0 - 200
Text game or competition	4.93	(14.52)	1 - 100	0.14	(2.37)	0 - 100
New Zealand raffle/lottery	9.62	(25.42)	1 - 1,610	4.53	(18.02)	0 - 1,610
Lotto	26.13	(33.26)	1 - 1,200	16.25	(29.34)	0 - 1,200
Keno	11.36	(15.43)	1 - 160	0.31	(3.47)	0 - 160
Instant Kiwi tickets or other Scratch tickets	7.30	(16.13)	1 - 410	2.42	(9.70)	0 - 410
Housie or bingo	35.46	(41.31)	1 - 480	0.59	(7.82)	0 - 480
Horse/dog race betting[†]	64.95	(152.50)	1 - 1,800	7.84	(53.57)	0 - 1,800
Sports betting	43.33	(145.13)	1 - 2,200	2.13	(29.60)	0 - 2,200
Casino table games or EGMs (NZ/overseas)	85.75	(211.46)	1 - 3,020	10.05	(73.37)	0 - 3,020
Casino table games (NZ)	70.75	(154.47)	1 - 1,200	2.74	(29.75)	0 - 1,200
Casino EGMs (NZ)	52.28	(99.21)	1 - 1,500	4.41	(31.07)	0 - 1,500
Non-casino EGMs	48.90	(171.14)	1 - 4,500	7.01	(64.97)	0 - 4,500
Short-term speculative investments	5,650.23	(9581.24)	10 - 50,000	46.91	(1,020.48)	0 - 50,000
Overseas internet gambling for money/prizes[#]	62.35	(109.61)	1 - 600	0.41	(9.63)	0 - 600

Abbott et al., 2014a, p. 65

[#] Overseas internet gambling = Not included in other overseas categories

[†] Excludes one response of $40,000 at track and $100,000 overseas (note, same person)

Total typical monthly gambling expenditure is shown in Table 4 (Abbott et al., 2014a, p. 64). The bulk of expenditure was channelled into short-term speculative investments, Lotto, horse or dog races, non-casino EGMs, raffles and lotteries, cards for money and casino table games. Total reported expenditure for text games or competitions and other overseas internet gambling were relatively lower than other modes of gambling.

Table 4: Total typical monthly expenditure estimates for New Zealand adult population

	Total typical monthly expenditure estimates for New Zealand adult population		
Gambling activity	**Total $**	**Proportion of total %**	**Proportion of total excl. short term investments %**
Cards for money	10,000,219.50	3.3	6.1
Bets with friends/workmates for money/prizes	4,939,622.17	1.6	3.0
Text game or competition	409,047.33	0.1	0.2
New Zealand raffle/lottery	13,062,588.62	4.4	8.0
Lotto	46,907,447.90	15.7	28.6
Keno	902,003.34	0.3	0.5
Instant Kiwi tickets or other scratch tickets	6,999,672.48	2.3	4.3
Housie or bingo	1,691,149.49	0.6	1.0
Horse/dog races[†]	22,621,145.80	7.6	13.8
Sports events	6,143,537.00	2.1	3.7
Casino table games or EGMs (NZ and overseas)	29,023,963.45	9.7	17.7
Casino table games (NZ)[††]	7,913,030.81	2.6	4.8
Casino EGMs (NZ) [††]	12,735,542.85	4.3	7.8
Non-casino EGMs	20,239,655.63	6.8	12.3
Short-term speculative investments	135,423,037.69	45.2	-
Overseas internet gambling for money/prizes	1,182,733.33	0.4	0.7
Total	*299,545,823.73*	*100*	*100*

Abbott et al., 2014a, p. 65

[#] Overseas internet gambling = Not included in other overseas categories

[†] Excludes one response of $40,000 at track and $100,000 overseas (note, same person)

[††] Excluded from calculation of *Total* row as included in 'Casino tables games or EGMs (NZ and overseas)'

Industry commissioned surveys

Research by NZ Lotteries in July 2010 estimated an annual spending of $115 million and an annual winning of $91 million on overseas online gambling (Colmar Brunton, 2010 as cited in NZ Lotteries, 2012).

Research carried out by Nielsen (2010) estimated that New Zealanders spent a total of $2,061 million per year on overseas online gambling which was consistent with their earlier finding of $2,053 million in 2008. Differing from both the PPAG and NGS surveys, the Nielsen survey provides expenditure estimates extrapolated from turnover estimates. Their breakdown for specific online gambling activities is detailed in Table 5. These are projected amounts based on mean annual turnover by New Zealanders on various overseas online gambling activities. Turnover measures the total amount spent on gambling including wins which are re-invested. This is different from net expenditure which measures the amount of money "lost" on gambling, that is to say, the amount of money gambled not including any winnings - the 'out-of-pocket' amount. Turnover estimates will, therefore, be higher than corresponding net expenditure estimates.

Table 5: Mean annual turnover by New Zealanders and the projected turnover by New Zealanders by activity

Activity	Mean turnover per online gambler per annum NZD (rounded to nearest 1000)	Projected turnover for New Zealanders per annum NZD (rounded to nearest 1000)
Racing or sports betting online through an overseas TAB, bookie or betting exchange	$30,000	$675 million
Online casino games (other than poker) such as blackjack, roulette etc.	$20,000	$557 million
Online poker	$7,000	$373 million
Online skill games such as chess, scrabble, mah-jong, backgammon, bridge etc.	$6,000	$185 million
Virtual racing or virtual sports betting	$11,000	$135 million
Online overseas lotteries	$7,000	$113 million
Online bingo	$2,000	$22 million
Total		*$2,061 million*

Nielsen, 2010, p. 16

2.4.2 International trends in online and offshore online gambling expenditure

Revenue from online gambling is predicted to increase at a rate that will "outpace the growth of the global gambling market and represent an increasing proportion of international revenues" (Gainsbury, 2012, p. 7). Current trends in consumer participation and expenditure show an ongoing increase in spite of some government attempts (such as in the United States of America [USA] and China) to restrict or prohibit such gambling activities (Gainsbury, 2012). However, within online gambling, the size and breakdown of the offshore gambling market can only be estimated (Gainsbury, 2012). Industry estimates have suggested that the global internet gambling market was worth US$28.32 billion in 2012 and predicted to increase to US$49.64 billion by 2017 (Global Betting and Gaming Consultancy, 2013 as cited in Gainsbury, Russell, Wood, Hing & Blaszczynski, 2015c).

In a report by United Kingdom (UK)-based, H2 Gambling Capital, the 2010 mobile gambling market which was valued at €2.22 billion was predicted to reach €5.4 billion in 2015 which was a 19.3% yearly growth rate (Baker, 2011). Comparisons with other modes of gambling suggested that at the end of 2010, the mobile gambling market accounted for 9.8% of the interactive gambling market and 0.6% of the global gambling market (Baker, 2011). It was also estimated that the mobile gambling market largely comprised horse/dog race betting (77%) with the Japanese Racing Association accounting for almost 57% of this figure (Baker, 2011). Mobile casino gambling and mobile lottery were predicted to gain popularity in the five years following the study.

More recent market research estimates indicate that in 2013 the global online gambling industry generated a total gross profit of US$35.3 billion, demonstrating a compound annual growth rate (CAGR) of 9.5% from 2009 to 2013 (Research and Markets, n.d.). The predicted CAGR of 9.6% between 2013 and 2018 mean that this industry's value will be US$55.8 billion in 2018 (Research and Markets, n.d.). H2 Gambling Capital predicts that the global online gambling market is likely to see an even higher CAGR of 10.6% between the year 2014 and 2018 (Stocks, 2015).

In the UK, the British regulated remote gambling sector held a market share of 12%; a large proportion of British consumers engaged in remote gambling activities on overseas regulated

sites. The overseas remote gambling market was estimated at £1.9 billion in 2010, which was three times larger than the British regulated remote market (Gambling Commission, 2011). Participation in remote gambling in the UK has also increased over the years, at 7.2% in 2006, 8.8% in 2007, 9.7% in 2008, 10.5% in 2009, 11.1% in 2010 and 11.2% in 2011. Increases were, however, largely driven by increases in online participation in the National Lottery. Results from recent gambling participation surveys in the UK show that online gambling participation rates had increased to 15% in 2013 (n=4,013), 2014 (n=4,002) and 2015 (n=4,004) (Gambling Commission, 2015b).

2.5 Sports and horse/dog race betting

Findings from the national surveys suggest that sports and horse/dog race betting are less prevalent when compared to other land-based gambling modes such as Lotto, Instant Kiwi and scratch tickets, and electronic gaming machines. Participation prevalence estimates also indicate that a higher percentage of gamblers engage in land-based sports and horse/dog race betting than in offshore online sports and horse/dog race betting.

Expenditure estimates between surveys were generally incomparable. Nevertheless, it was worthy of note that in both the PPAG surveys and NGS surveys, there appeared to be a higher level of expenditure estimates for horse/dog race betting than for sports betting.

2.6 Population characteristics and associated risks

Considering the international growth in online gambling participation and expenditure, it is critical to be aware of associated risks (detailed in Section 2.7) although such growth may still be at an early stage in New Zealand. At present there are no studies that have compared risks associated with internet-based and land-based gambling in New Zealand. Demographics of the offshore online gambler sub-group also remain largely unexplored.

In general, population groups that have been identified as being at greater risk of developing problem gambling include individuals between the age of 25 and 34 years, who are Māori or Pacific Islanders, who are employed, who live alone, and who have lower educational levels (Abbott et al., 2014b; Ministry of Health, 2006). However, the characteristics of online gamblers and offshore online gamblers may differ slightly to these overarching demographics. Studies carried out in Australia, the UK and the USA and studies involving participants from multiple countries have found that internet gambling tended to be more popular among men, young adults or those in younger age categories, and those who were single, well educated, in professional occupations, and with above-average incomes (Gainsbury et al., 2015a; Gainsbury et al., 2015b; Griffiths, Wardle, Orford, Sproston, & Erens, 2009; McBride & Derevensky, 2009; Wardle et al., 2011a; Wood & Williams, 2007a; Wood & Williams, 2009; Wood & Williams 2011; Woodruff & Gregory, 2005; Woolley, 2003). Findings from a longitudinal gambling study in Sweden indicated that while internet gambling was popular among youth (similar to other studies), it was also popular among people with lower educational levels, and was gaining popularity among women (Svensson & Romild, 2011). Such differences in trends suggest the possibility of online gambler characteristics being variable in different countries or an indication of changing trends.

The gambling behaviour of online gamblers may also differ from land-based gamblers. An Australian prevalence study (N=2,010) reported by Gainsbury et al. (2015a) found that those who engaged in interactive gambling also engaged in a significantly larger number of gambling modes and gambled more frequently, confirming that they tended to be highly involved gamblers. The authors reasoned that such gambling versatility could result from the

convenience of access to various types of online gambling or could be due to interactive gamblers already having a tendency to be highly involved.

To some extent, some of the aforementioned demographic variables may predict gambling problems and other associated risks among internet gamblers in New Zealand.

2.6.1 Gender

As reported in studies elsewhere, males in New Zealand are more likely than females to engage in online gambling and offshore online gambling and, therefore, are more likely to be at risk of harm associated with these modes of gambling.

- Even in the small sample of individuals who engaged in internet-based gambling activities in the PPAG surveys, the majority were males in both the 2000 survey (11 males, 8 females) and 2005 survey (9 males, 3 females).
- The 2006/07 NZHS found that males were significantly more likely to engage in internet gambling compared to females.
- In the 2006/07 GBAS there were more males than females among those who played an internet game for money. However, in the GBAS survey more females than males had played a text game for money.
- The 2010 HLS found that internet gamblers comprised twice as many males (12.8%) as females (5%) (Devlin, 2011). In the 2012 HLS, among those who engaged in internet games through overseas websites, 2.3% were male and only 0.5% female (Tu, 2013).
- The Nielsen (2010) survey found that males were more likely than females to gamble on overseas websites. In their report on the demographics of online gamblers, their online gambling population sample (n=396) was 67% male and 33% female. Their sample of TAB account holders who gambled online (n=810 was 88% male and 12% female.

The NGS survey, however, found there were no gender differences for offshore online gambling (Abbott et al. 2014a).

2.6.2 Age

Most findings from New Zealand national surveys indicated that adults in the younger age groups were more likely to engage in internet gambling and offshore online gambling.

- In the 2005 PPAG survey, the percentage of respondents who were aged 20-24 years who had engaged in internet gambling (2%) was slightly higher than those aged 25-54 years (1%) and the rest of the older and younger respondents (0%) (Department of Internal Affairs, 2008). The survey also found that people in the 20-24 year age group were more likely to indicate future intent to participate in internet gambling (Department of Internal Affairs, 2008, p. 177).
- In the 2006/07 GBAS, internet gambling was more common for participants aged 18-24 years than any other age group (Health Sponsorship Council 2007).
- In the NGS, 35-44 years, 45-54 years and 55-64 years age groups exhibited similar levels of engagement in all gambling modes (Table 6). The older age group (65+ years), however, had a lower level of participation in text games and overseas internet gambling (Abbott et al., 2004a).

- Nielsen (2010) reported that those aged 18 to 24 years were over-represented in the online gambling population (Table 6). They also reported that those aged 18-34 years were more likely to gamble online overseas.
- Showing a somewhat similar pattern, in the 2010 and 2012 HLS there was a higher percentage in the 18-24 year age group among internet gamblers (Table 6).

Table 6: Offshore online gambling participation by age group

Age group	Nielsen 2010 online gamblers (n=396) (%)	Nielsen 2010 TAB account holders who gamble online (n=810) (%)	NGS 2012 Overseas internet gambling (N=6,215) (%)	HLS 2010 Internet game through overseas website (N=1,740) (%)	HLS 2012 Internet game through overseas website (N=2,673) (%)
15-17 years	-	-	-	-	1.2
18-24 years	27	29	1.1	11.8	4.0
25-34 years	26	32	1.9	11.1	2.0 [#]
35-44 years	19	17	0.7	7.5	
45-54 years	16	14	0.1	10.7	
55-64 years	9	6	0.2	7.3	0.2 [##]
65 years +	4	2	-	4.2	

[#] For age group 25-44 years
[##] For age group 45+ years

NZHS findings, however, showed a relatively similar prevalence across all age groups for internet-based gambling. Those survey findings show that 0.7% of adults aged 15 years and older in 2002/03 and 0.4% in 2006/07 engaged in internet-based gambling. For adults aged 18 years and older, percentages were 0.6% in 2002/03 and 0.4% in 2006/07. For adults aged 20 years and older, the figures were 0.5% in 2002/03 and 0.4% in 2006/07.

Underage gambling was referred to as a possible risk in a brief note by the New Zealand Racing Board (2014) submitted to the Racing Minister. Understandably, the high usage of advanced online communication technologies among youth suggests a possibility of their engagement in online interactive gambling, despite the lack of supporting data (Commonwealth of Australia, 2009). However, in Australia it has been reasoned that age verification and the requirement to own a credit card to secure winnings from interactive gambling would make this gambling mode inaccessible to youth (Commonwealth of Australia, 2009). In New Zealand, the 2005 PPAG survey found that although a majority of teenagers (82%) had access to the internet "none of the teenage respondents had spent any money on internet-based gambling either in New Zealand or overseas" (Department of Internal Affairs, 2008, p. 209). While this finding suggests low risks for underage gambling, future research on offshore online gambling in New Zealand should consider age category as an important demographic variable. The aforementioned findings suggest that the younger age group (i.e. the more technologically savvy population group) is likely to be a predictive feature of online gamblers.

2.6.3 Ethnicity

Very little comparable data was found for the ethnic breakdown of online and/or offshore online gamblers. In some surveys the small sub-sample of internet gamblers provided little generalisable trends by ethnicity.

Findings reported in the 2010 Nielsen, 2012 HLS and 2012 NGS reports on the ethnic breakdown of offshore online gamblers are detailed in Table 7.

Table 7: Offshore online gambling participation by ethnicity

Ethnic group	Nielsen 2010 New Zealand online gamblers (n=396) (%)	Nielsen 2010 TAB account holders who gamble online (n=810) (%)	HLS 2012 Internet game through overseas website (N=2,673) (%)	NGS 2012 Overseas internet gambling (N=6,215) (%)
NZ European/ (European/Other)	68	77	1.1	0.7
NZ Māori/Māori	17	9	1.1	1.3
Samoan	4	2	-	-
Cook Island Māori	2	1	-	-
Tongan	0	1	-	-
Niuean	1	1	-	-
Pacific	-	-	0.3	0.6
Chinese	11	10	-	-
Indian	4	3	-	-
Asian	-	-	7	0.8
Other	7	8	-	-

Although the Nielsen study suggests a higher prevalence of offshore online gambling among New Zealand Europeans, the participants were a self-selected sample of people who use the internet and/or who place bets over the internet. In the NGS, it was noted that all ethnic groups exhibited "very low levels of overseas internet gambling with no differences between them" (Abbott et al., 2014a, p. 53). Among 12 internet gamblers who participated in the 2005 PPAG survey, "two were Asian and 10 were from the general population" (Department of Internal Affairs, 2008, p. 177). The PPAG survey report also noted that no Māori or Pasifika respondents indicated having participated in internet gambling.

2.6.4 Income

Comparable data on participant income in the different surveys is also limited. Nevertheless, as has been noted in the international literature, findings from some New Zealand surveys suggest that online gambling and offshore online gambling are likely to be more frequently accessed by those in higher income brackets.

A majority (10 out of 12) who engaged in internet gambling in the small sample in the 2005 PPAG survey were from households with over $60,000 average annual income. Seven individuals who indicated a definite intention to participate in internet gambling were also from this higher household income category (Department of Internal Affairs, 2008).

In the 2012 HLS, among those who indicated engagement in internet gambling through overseas websites, 1.4% had low income, 0.5% medium income and 1.6% high income (for household equivalised income). The personal income categories of offshore online gamblers reported by Nielsen is shown in Table 8.

Table 8: Demographics of online gamblers: Personal income

Personal Income	New Zealand online gamblers (n=396)	TAB account holders who gamble online (n=810)
$20,000 or less a year	23%	17%
$20,001 - $30,000	10%	10%
$30,001 - $50,000	22%	26%
$50,001 - $70,000	16%	20%
$70,001 - $100,000	13%	13%
More than $100,000	8%	9%
Refused	8%	4%

Nielsen, 2010, p. 23

Although limited, these data indicate the possibility of online gambling and offshore online gambling being more prevalent among higher income earners.

2.7 Risks associated with online gambling and online offshore gambling

In a recent NGS report, past year overseas internet gambling was identified as one of the gambling-related risk factors for current problem gambling (Abbott et al., 2014b). When participation in gambling activities during the past 12 months was considered in relation to Problem Gambling Severity Index (PGSI) level, a higher percentage of problem gamblers (11.7%) engaged in overseas internet gambling[14] than non-problem gamblers (0.7%), low-risk gamblers (1.4%) and moderate-risk gamblers (1.7%) (Abbott et al., 2014b). The report highlighted that about 10% of problem gamblers used overseas internet gambling sites[9] in the past year compared to less than one percent of adults generally (Abbott et al., 2014b, p.124). This suggested that while the majority of problem gamblers did not engage in offshore online gambling[9], problem gamblers had a greater tendency to engage in this type of gambling compared to non-problem gamblers, moderate-risk and low-risk gamblers.

Findings from other national surveys, however, did not provide clear associations between internet gambling and problem gambling severity. In the 2006/07 NZHS report, past year participation prevalence for internet-based gambling was 3.1% among problem gamblers, 6% among moderate-risk gamblers, 2.8% among low-risk gamblers and 0.4% for recreational gamblers (Ministry of Health, 2009). Among those who engaged in internet-based gambling in the past year, 3.2% were problem gamblers and 19.4% were moderate-risk gamblers (Ministry of Health, 2009). In the 2012 HLS, among those who indicated engagement in internet gambling through overseas websites, 1.9% were non-problem gamblers, 4.5% were low-risk gamblers, and 2.0% were moderate-risk or problem gamblers.

A number of recent international studies have indicated that internet gamblers tend to exhibit higher problem gambling levels when compared to land-based gamblers or general community samples (MacKay & Hodgins, 2012; McBride & Derevensky, 2009; Wood & Williams, 2011). A longitudinal study (2006 to 2011) of gambling and problem gambling in Canada, involving a sample of 4,121 adults found association between online gambling and problem gambling (Williams et al., 2005). The study also noted that this association was both a result of problem gamblers adding internet gambling to their existing range of gambling modes and online gambling causing the start of problem gambling, with the latter being a more common reason. In their study, while 30% of respondents had pre-existing gambling problems prior to starting online gambling, 44% developed problem gambling after engaging in online gambling. As noted in other studies, the authors suggested that internet gambling poses problem gambling risks because of the continuous modes of gambling it provides and its 24 hour convenient accessibility.

In a recent prevalence study in Australia (N=15,006), negative consequences reported by a minority of interactive gamblers included increased expenditure and disruptions to eating and sleeping patterns, which resembled harms associated with constant and conveniently available gambling opportunities (Gainsbury et al. 2015a). In another Australian study examining the risks of online gambling, Gainsbury et al. (2015c) found that in a sample of 2,799 online gamblers, a majority of problem gamblers (61.5%) indicated problems occurred after they started gambling online. A higher percentage of problem gamblers (compared to non-problem and at-risk gamblers) reported increased expenditure resulting from increased use of electronic funds, gambling between midnight and 6.00 am resulting in sleep disruptions, and disrupted

[14] Overseas internet gambling sites were all those excluding overseas sites covered elsewhere in the report, namely on sports and track betting, lotteries and poker.

food consumption. They also found that online problem gamblers were more prone to drug use while gambling, suggesting the use of stimulants to prolong online gambling sessions. The authors suggested unique problems brought on by internet gambling for problem gamblers included issues related to electronic payments and its constant availability. However, Gainsbury et al.'s (2015b) comparative study found that mixed mode gamblers and land-based gamblers had higher PGSI scores when compared to internet gamblers in Australia. The higher scores were attributed to a higher level of engagement in electronic gaming machines. Their results suggested that different modes of gambling were associated with different levels of problem gambling.

In Gainsbury, Suhonen and Saastamoinen's (2014) findings of an online survey of 10,838 online gamblers from 96 countries, it was noted that chasing losses (an indicator of at-risk and problem gambling) was higher among online casino players than among online poker players. Their study suggested different levels of harm associated with different types of online gambling. The study also noted that women tended to chase losses more than men, which suggested that women may be at greater risk of developing internet gambling problems than previously assumed.

Internet gambling has also been associated with problem gambling because of the high occurrence of problem gamblers in samples of internet gamblers (Gainsbury, 2012). A possible reason for such prevalence is the use of this mode of gambling by problem gamblers when other gambling modes are inaccessible; therefore, internet gambling could either sustain or intensify existing problems (Gainsbury, 2012). A study in Canada involving undergraduate students (43 online gamblers and 172 males), found that internet gamblers had a higher level of problem gambling severity and were more likely to report cognitive distortions than non-internet gamblers (MacKay & Hodgins, 2012).

In an examination of online and land-based gambling among respondents of the 2010 British Gambling Prevalence Survey (N=7756), Wardle et al. (2011a) found that a subgroup of online-only gamblers did not include anyone classified as problem gamblers based on DSM-IV scores. Mixed mode gamblers (i.e. those who engaged in both online and land-based gambling) had a significantly higher problem gambling prevalence than land-based only gamblers. They also noted that demographics, gambling involvement and problem gambling prevalence rates of online-only gamblers differed from the land-based only and mixed mode gambler groups. This, according to the authors, emphasised the existence of characteristic differences between individuals who subscribe to certain types of online gambling activities (e.g. purchasing lotteries online for convenience) and those who spend increasing amounts of time on online games.

A longitudinal study in Sweden found an association between gambling in unregulated sites and problem gambling (Svensson & Romild, 2011). While gamblers using regulated sites had a higher rate of problem gambling than non-internet gamblers, there was a lower percentage of problem gamblers among users of regulated sites than users of unregulated sites (Svensson & Romild, 2011). They drew attention to an earlier study in Sweden (Tryggvesson, 2007 as cited in Svensson & Romild, 2011) which noted differences in the demographic backgrounds between users of state-owned sites and unregulated sites. Higher rates of problem gamblers among users of unregulated sites could be due to high-frequency gamblers and problem gamblers finding these sites more attractive, or design of the sites and game features that increase chances of problem gambling development (Svensson & Romild, 2011).

Contrary to the aforementioned findings, a study using secondary data which corrected for missing variable biases found that past year online gambling participation was associated with decrease in problem gambling severity (Philander & MacKay, 2014). Gainsbury et al.'s (2015b) comparative study reported that mixed mode gamblers and land-based gamblers

exhibited higher PGSI scores when compared to internet gamblers in Australia. The higher scores were attributed to a greater level of engagement in electronic gaming machines. Gainsbury et al.'s results suggested that different modes of gambling were associated with different levels of problem gambling.

As noted earlier, findings from New Zealand surveys show inconsistent associations between problem gambling and online gambling which suggest a cautionary approach should be taken in related decision making. However, the strong associations reported in the majority of international studies and the preliminary findings from the NGS, provide cause for concern over the problem-related risk of online gambling in general, and offshore online gambling in particular. Additionally, as problem gambling is often hidden, the capacity for online modes of gambling to sustain or exacerbate problems is worthy of note. Due to the anonymity and flexible 24 hour access, internet gambling makes it easier for gamblers to hide their problem.

Based on a comprehensive review of related literature, Gainsbury (2015) concluded that although online gambling, per se, does not cause problem gambling, but that related problems are likely to increase with increased participation due to its popularity among highly involved gamblers and its contribution to gambling problems among some users. This suggests the need for ongoing research that contributes further understanding on the characteristics of online gamblers, problem gambling risk resulting from online gambling, and approaches for reducing this risk (Gainsbury, 2015).

2.8 Differences in findings between gambling participation surveys in New Zealand

Although sample sizes differed between surveys, most relied on large representative samples to provide reliable data. Some survey questions have changed over time with the inclusion of items on offshore online gambling and specific sub-categorised items which aimed to capture the growing diversity of overseas-based gambling activities that New Zealanders now have access to.

However, differences between these national surveys have reduced comparability between findings and the way findings are reported may have reduced the evidential strength of existing data. The following differences were noted in this review:

(a) Differences in survey focus, data collection methods and participant inclusion criteria

The surveys have differed in terms of focus areas and inclusion criteria which may have contributed to differences in findings.

- HLS and NZHS surveys used nationally representative samples of the general population and included respondents aged 15 years and older. The samples included gamblers and non-gamblers. The surveys, carried out face-to-face, were generally focused on health-related behaviours and included sections on gambling participation in the past 12 months and problem gambling risk level.
- PPAG surveys were presented to potential participants as a gambling study and were conducted either face-to-face or by telephone. Respondents included those aged 15 years and older. Questions on gambling participation in these surveys were based on respondents' past year gambling participation.
- The National Gambling Study was presented as a gambling study and included respondents aged 18 years and older. All participants were interviewed face-to-face.

Similar to other national surveys, questions were based on past year gambling participation. Participants included gamblers and non-gamblers.

- The 2010 Nielsen survey relied on a sample of online gamblers consisting of TAB account holders and Nielsen's online panel members (Nielsen, 2010). Their sample consisted of respondents aged 18 years or older. To qualify for the Nielsen survey, respondents needed to have paid money to engage in at least one offshore online gambling activity (listed in the beginning of their survey) in the past year (Nielsen, 2010). This suggests an oversampling of a particular population group which has the potential to bias results.

(b) Differences in survey items and method of reporting

- As exemplified in sub-section 2.3.1, differences in items between surveys (e.g. the manner in which questions about online gambling were asked) and differences in reporting method (i.e. the manner in which different modes of gambling were combined into single overarching categories) may have also contributed to differences in survey findings.

(c) Lack of comprehensive reporting on offshore online gambling sub-categories

In some surveys, although questions included sub-categories of online gambling, possibly because of low prevalence rates, these were not reported in detail. Such aggregated reporting of findings meant that the prevalence of offshore online gambling remains unclear in many of the New Zealand national surveys.

- In PPAG surveys, internet-based gambling was described to respondents as including the following: "playing casino type games for money, purchasing lottery tickets and betting on sporting events, on horse or dog races through the internet" (Department of Internal Affairs, 2008, p. 240). Although a gambling participation question with sub-categories of online offshore gambling was noted in the questionnaire, results were not provided for these categories in the reports. It was, nevertheless, reported that in both the 2000 and 2005 surveys "most of the internet gambling was through a New Zealand based organisation" (Department of Internal Affairs, 2008, p. 172).
- Similarly, the 2002/03 NZHS reported generally for "Track betting (horse and dog races)" and "Sports betting" (Ministry of Health, 2006, p. 34) even though the gambling participation question in the 2002/03 questionnaire included the sub-categorised items: "TAB Horses/dogs", "Overseas horse and dog races", "TAB Sports" and "Overseas sports betting".
- In the 2006/07 NZHS survey, items in the gambling participation questions were changed to include: "Horse or dog racing (excluding office sweepstakes)" and "Sports betting at the TAB or with an overseas betting organisation" and "Internet based gambling". The 2011/12 NZHS questionnaire had further changes, with the item "Sports betting through NZ TAB", the addition of "Paying to gamble on overseas websites (not MyLotto or NZ TAB)", and the removal of internet gambling. Findings were, however, combined into an "other gambling activities" category in the report which was a combination of "housie, table games and other games at a casino; and other gambling activities" (Ministry of Health, 2012, p. 7).

- While in earlier years, the HLS had included an item on internet gambling, in "2010 the questionnaire was expanded and questions were asked about online participation in each of a list of specified modes of gambling and through an overseas website" (Gray, 2011, p.15). These included a range of offshore online gambling sub-categories such as overseas sports betting, internet poker, online casino games and overseas lottery. However, the 2012 HLS report included combined findings for "internet game through overseas website" and findings on sub-categories were not reported.

(d) Differences in expenditure estimate method

As noted in sub-section 2.4.1 gambling participation surveys in New Zealand used different wording for questions on expenditure, and used different methods for calculating gambling expenditure estimates. While such differences reduced comparability between findings, the methods used would also have had an impact on projected estimates.

To provide an example, a question on overseas track betting in the PPAG survey asked respondents how often they placed "money on horse or dog races through an overseas betting organisation or an overseas TAB" and elicited responses in a set of frequency categories (which included number of times in a week, in a month and in a year) (Department of Internal Affairs, 2008, p. 226). A subsequent question then asked participants to state how much they would "bet on an average day". However, individuals with a gambling frequency of less than once every two months were asked to indicate how much they spent on the "last occasion".

Although the NGS surveys elicited responses using frequency categories similar to the PPAG survey, questions were worded differently. The NGS survey question on overseas track betting asked respondents how often they placed "money on horse or dog races through an overseas betting organisation or an overseas TAB by telephone, or online (e.g. via the internet through a PC, laptop, iPad, iPhone, or other handheld device), or interactive TV". In a subsequent question, respondents were asked how much they would "bet in a typical month" (National Research Bureau, 2012, p. 34).

In the 2010 Nielsen survey, turnover estimates were based on respondents' last gambling occasion. Respondents were asked: "On the last occasion that you participated in each of the following activities, how much did you spend, including any winnings you reinvested?" Annual amounts were then "projected using the frequency of each activity for each individual" (Nielsen, 2010, p. 19). Nielsen regarded this the most effective method for measuring turnover considering difficulties respondents may have in calculating an average turnover. They reasoned that "putting together individuals results should even out the impact of those who were lucky/unlucky on their last occasion, as well as those who gambled high/low amounts last occasion" (Nielsen, 2010, p.19). However, measuring turnover estimates where winnings and stakes are included are not the same as expenditure estimates which calculate the amount of money "lost" on the gambling activity.

3 RESEARCH METHODS

Research methods are fully described in Report Number 1 of the National Gambling Study (Abbott et al., 2014a). A brief summary of the research methods is presented in this chapter.

3.1 Ethics approval

Ethical approval to conduct each stage of the NGS was granted by the Health and Disability Ethics Committees. For full details see Abbott et al., 2014a, 2015.

3.2 Survey instrument

The survey instrument[15] for the National Gambling Study assessment was extensive and covered 12 key areas:

1. Leisure activities and gambling participation
2. Past gambling and recent gambling behaviour change
3. Problem gambling (including help-seeking behaviours and gambling in households)
4. Life events and on-going hassles
5. Attitudes to gambling in New Zealand
6. Mental health (general psychological distress, quality of life)
7. Alcohol use/misuse
8. Substance (tobacco, other drugs) use/misuse
9. Health conditions
10. Social connectedness
11. New Zealand Individual Deprivation Index
12. Demographics.

Full survey instrument details for the NGS are reported elsewhere (Abbott et al., 2014a)

As part of the gambling participation and expenditure data collected, there were specific questions[16] on past year offshore gambling[17]. Specifically, these related to:

- Buying a ticket in an overseas raffle or lottery (includes tickets bought in an overseas shop, by telephone, through the post or online)
- Playing poker for money or prizes online (e.g. via the internet through a personal computer, laptop, iPad, iPhone or any other handheld device) or interactive television
- Betting on horse or dog races through an overseas TAB or other overseas betting organisation or website
- Betting on sporting events through an overseas betting organisation or an overseas TAB by telephone, online (e.g. via the internet through a personal computer, laptop, iPad, iPhone or any other handheld device) or interactive television
- Played table games or pokies at an overseas casino (in person)

[15] Available from the Gambling and Addictions Research Centre, Auckland University of Technology website: www.aut-grc.ac.nz

[16] The wording here is the same as in the questionnaire though the questions were usually prefaced with a past 12 month qualifier.

[17] As offshore gambling was not the primary focus in the design of this study, there are some inconsistencies and differences in the way offshore gambling questions were worded.

- Other online gambling for money:
    - Bet on an event through an overseas website (e.g. on an election result or television show)
    - Played online casino games other than card games (e.g. roulette)
    - Played internet bingo
    - Played skill games online (e.g. chess, scrabble, mah-jong, bridge, backgammon)
    - Placed a bet on a virtual race or sports event
    - Participated in any other gambling or lottery activity (e.g. gaming machines or instant games) online through an overseas website for money.

Additionally, data were collected for New Zealand-based internet/remote interactive gambling[18] participation and expenditure, specifically:

- Buying Lotto tickets online from the MyLotto website
- Buying keno tickets online from the MyLotto website
- Betting on horse or dog races through the New Zealand TAB by telephone, online or SKYbet interactive television
- Betting on sporting events through the New Zealand TAB by telephone, online or SKYbet interactive television.

3.3 Survey methodology

The full survey methodology is described in Report numbers 1 and 4 of the NGS (Abbott et al., 2014a, 2015a). For ease of reading the current report, key aspects of the survey methodology have been briefly reproduced below.

- Survey sampling was at the meshblock (small area)/dwelling/eligible respondent level
- Random selection procedures were used to minimise sampling bias
- Interviews were conducted face-to-face with respondents in their homes (dwellings).
- Interviews were conducted using Computer-Assisted Personal Interviewing (CAPI) software
- The survey had nationwide coverage
- All adults were eligible and the survey was representative of the New Zealand adult population (18 years or older)
- Up to seven calls were made to a household to contact the eligible respondent
- There was no inducement or coercion of respondents
- Māori, Asian and Pacific respondents were oversampled.

3.4 Sample size

A randomly selected national sample of 6,251 people aged 18 years and older living in private households was interviewed face-to-face in 2012 (Wave 1). The response rate was 64% and the sample was weighted to enable generalisation of the survey findings to the general adult population. One year later in 2013 (Wave 2), 3,745 participants were re-contacted and re-interviewed. Due to budgetary constraints, attempts were only made to re-contact 5,266 of the original 6,251 participants. Therefore, a 71% response rate was achieved in 2013 (60% of the

[18] Online gambling in New Zealand is restricted to Lotto and keno gambling via the MyLotto website and to horse/dog race and sports betting via the New Zealand TAB. Other modes of gambling conducted online are with offshore websites.

total original sample). In 2014 (Wave 3), 3,115 participants were again contacted and interviewed. This was an 83% response rate.

3.5 Weighting

Wave 1 weights, in order to be representative of the New Zealand population, were based on age group, gender and ethnicity. Wave 2 and Wave 3 weights incorporated Wave 1 weights but also took into consideration differential attrition in the same categories. Factor weights for analyses were based on the 2013 Census, from Wave 1 to Wave 3 for the present report[19].

The application of age, gender and ethnicity-based weights to Wave 2 and Wave 3 data causes an underestimation of the estimated proportions in the moderate-risk and problem gambler categories. Therefore, raking (gender-age-ethnicity in one margin, problem gambling risk category in the other) was used to produce the final weights. Raking was applied to the Wave 1 sample to preserve the observed proportions in each problem gambling risk category. It was then applied separately to the Wave 2 and Wave 3 samples in order to match the weighted marginal frequencies of the Wave 1 sample, in an effort to allay any gambling outcome-based differential attrition.

3.6 Data analysis

3.6.1 Descriptive statistics

Prevalence statistics

Population prevalence and 95% confidence intervals based on Census+attrition weights are presented. Wave 1 results are adjusted by sampling and Census weightings only, Wave 2 and Wave 3 results are also adjusted for attrition by age, gender, ethnicity and PGSI categories. Results were produced by gambling activity mode and by major demographics and overall gambling participation categories. Average expenditure and standard errors were produced by gambling activity mode. Results were limited to gambling activities for which either an online or offshore mode was identified.

Transition descriptive statistics

Tables describing key activity modes of gambling, for example from in-person at venue to online transitions between Wave 1, Wave 2 and Wave 3 display Census+attrition-weighted frequencies (relevant to the wave), along with transition incidence proportions based on the latter. Due to the complexities of the transitions and the small numbers involved, 95% confidence intervals are not provided.

[19] The baseline reports for the NGS (Abbott et al., 2014a, 2014b) were analysed with factor weights based on the 2006 Census as the 2013 Census data were not available at that time. Therefore, percentages presented in this report may vary slightly from those presented in the previous reports.

3.6.2 Inferential statistics

Inference on activity modes

Inferential statistics have focused on explaining the difference between participants who participated in online or offshore online gambling modes versus those who do not. The gambling activities investigated were Lotto for online vs. shop purchases, horse/dog race betting for online/remote interactive (offshore and domestic) vs. horse/dog race betting at a venue, sports betting for online/remote interactive (offshore and domestic) vs. sports betting at a venue, and combined sports and horse/dog race betting for offshore vs. all domestic gambling.

Model selection generally proceeded through several steps. The first step was to identify candidate variables in bivariate analyses with the outcome variable that has a p-value < 0.2. Models were then developed for each of the major data domains (e.g. demographics, participation, co-existing conditions) using the candidate variables, in order to identify the best subset of variables from that data domain. Then all of the results from the separate domains were considered for an overall model. Each of the model building procedures followed a stepwise selection method tempered by consideration of information criteria. Parsimonious models were favoured, and competing models with similar fit but markedly different compositions have all been reported.

The base odds and odds ratio of potential explanatory covariates are reported as point estimates and 95% confidence intervals, accompanied by a p-value for the covariate.

4 RESULTS

This chapter details the results of data analyses focusing on New Zealand and offshore (both land-based and online/remote interactive) gambling participation overall (section 4.1) and by selected socio-demographic and gambling behaviours (section 4.2). Expenditure is detailed in section 4.3. Associated factors for offshore (land-based and online/remote interactive) and New Zealand online/remote gambling are in section 4.4, with transitions into and out of offshore and New Zealand online/remote gambling over time detailed in section 4.5. Comparisons between the National Gambling Study (NGS) data and other studies are made in section 4.6.

Only gambling modes where it was possible to participate both within New Zealand (NZ) and offshore and/or where online (internet-based) or other remote interactive gambling[20] were possible, are included in this report. These were commercial poker gambling, lotteries/raffles gambling, Lotto and keno gambling, casino gambling, horse/dog race betting and sports betting, and other offshore online gambling[21].

4.1 New Zealand and offshore gambling participation

Data pertaining to gambling modes excluding horse/dog race and sports gambling have been presented in Appendix 1 for 2012 (Wave 1), 2013 (Wave 2) and 2014 (Wave 3). Similar data specifically pertaining to horse/dog race betting and sports betting[22] are presented separately below in Table 11, Table 12 and Table 13. All gambling data refer to past year participation.

4.1.1 Participation in modes excluding horse/dog race and sports gambling

In Wave 1, the most popular mode of gambling was raffles and lotteries (including NZ lottery products such as Lotto and keno) with 72.5% of adults participating (Appendix 1). However, only 3% participated in offshore raffles and lotteries (both on-site and online/remote combined), whilst 5% participated in online Lotto and keno within New Zealand. The next most popular modes of gambling were casino (table games and EGMs) and non-casino EGM gambling with 11% and 14% participation respectively; four percent participated in on-site casino gambling offshore. Four percent of adults gambled on card games with 0.4% participating in commercial offshore online gambling. Less than one percent (0.6%) of adults participated in other offshore online gambling with internet casino games and EGMs making up the largest proportion (0.2%).

The popularity of gambling on raffles and lotteries remained constant over time for both New Zealand and offshore. However, the popularity of participating in Lotto online in New Zealand showed an increasing trend over time, with 6% participating in this way in Wave 2 and 8% in Wave 3. Although confidence intervals overlapped in consecutive years, they did not overlap from Wave 1 to Wave 3 which indicates the increasing trend in buying Lotto tickets online in New Zealand is real. Other modes of gambling appeared to either show a decreasing trend in participation over time, or remained at stable levels; however, due to small sample sizes and overlapping confidence intervals, the findings must be treated with caution (Appendix 1).

[20] This could be by telephone, interactive television or through the post.
[21] Other offshore online gambling relates to online gambling on the following: casino games and EGMs (not cards), bingo, event betting, skill games, virtual sport and other non-specified gambling.
[22] Horse/dog race betting and sports betting at an event, physically at a TAB, online/remotely with the NZ TAB or online/remotely with an offshore TAB or betting organisation/exchange.

Full intervention service statistics[23] for the three years, whilst not directly comparable, indicated similar trends. Overall, 3.3%, 3.3% and 4.8% (in 2012, 2013 and 2014) of treatment-seeking gamblers reported online/remote interactive gambling (NZ and offshore combined) to be a primary cause of their problem gambling. The corresponding percentages for offshore online/remote gambling were relatively stable at 2.2%, 2.1% and 2.9%. However, for New Zealand-based online gambling the percentages were 1.5%, 1.4% and 2.4%, with the increase in 2014 appearing to be due to people seeking help for horse/dog race and sports betting.

Overall gambling prevalence also appeared to show a small declining trend from Wave 1 to Wave 3 (Table 9). Again, although confidence intervals overlapped in consecutive years they did not overlap from Wave 1 to Wave 3 instilling confidence that the decrease is real.

Table 9: Prevalence of overall past year gambling by Wave

Wave (year)	N	%	95% CI
Wave 1 (2012)	6251	79.73	(78.55, 80.91)
Wave 2 (2013)	3745	77.70	(76.07, 79.31)
Wave 3 (2014)	3115	76.56	(74.61, 78.50)

Table 10 shows that only 2% of Lotto participants exclusively bought Lotto tickets online in Wave 1 with 6% buying tickets both online and from stores (within NZ). A higher percentage of keno participants bought keno tickets exclusively online (18.5%) with a further 5.5% doing so both online and from stores (within NZ). Whilst 6% of poker players gambled online (offshore), almost one-fifth (18.5%) played poker in both New Zealand commercial venues and offshore online. Relatively high percentages of casino gamblers participated in offshore (on-site) casinos either exclusively (18%) or in combination with NZ casino gambling (14%)

Table 10: Gambling by mode of access - excluding New Zealand Racing Board gambling

Gambling activity	NZ on-site	NZ online	Offshore on-site or online/remote[#]	n	%
Commercial poker	-	-	Yes	7	6.0
	Yes	-	-	86	75.5
	Yes	-	Yes	21	18.5
Total				*113*	*100.0*
Raffle/lottery	-	-	Yes	65	2.2
	Yes	-	-	2793	93.3
	Yes	-	Yes	136	4.5
Total				*2994*	*100.0*
Lotto	-	Yes	-	89	2.3
	Yes	-	-	3588	92.2
	Yes	Yes	-	216	5.6
Total				*3893*	*100.0*
Keno	-	Yes	-	33	18.5
	Yes	-	-	135	76.1
	Yes	Yes	-	10	5.5
Total				*178*	*100.0*
Casino	-	-	Yes	128	17.8
	Yes	-	-	489	68.2
	Yes	-	Yes	100	14.0
Total				*717*	*100.0*

Data weighted for 2013 Census data and sampling weights
[#] On-site or online/remote as relevant

[23] Data specifically provided for this study.

4.1.2 Participation in horse/dog race and sports gambling

Data were collected in regard to horse/dog race and sports betting (Table 11, Table 12 and Table 13). In Wave 1, overall, 12% of adults participated in horse/dog race betting and 5% in sports betting (14% for both, NZ and offshore). Of the horse/dog race bettors, 3% gambled online/ remotely with the New Zealand TAB, and 0.4% online/remotely with offshore TABs/betting organisations. For sports bettors the proportion was 2% vs. 0.4% for New Zealand vs. offshore online/remote betting. Overall, 4% of participants had bet online/remotely with the New Zealand TAB vs. 0.7% with offshore online/remote betting (Table 11).

As with other modes of gambling, overall horse/dog race and sports betting combined slightly reduced over time (12% in Wave 2, 11% in Wave 3). Both horse/dog race betting and sports betting decreased from Wave 1 to Wave 2. The trend continued for horse and dog race betting from Wave 2 to Wave 3 but appeared to stabilise for sports betting. For horse/dog race betting, confidence intervals overlapped between Wave 1 and Wave 2 but did not overlap between Wave 1 and Wave 3. For online/remote betting (NZ and offshore), there appeared to be a decrease in the percentages using this mode of betting from Wave 1 to Wave 2 which stabilised in Wave 3 (Table 12 and Table 13). However, due to small sample sizes and overlapping confidence intervals, the findings should be considered indicative only, particularly for online/ remote betting.

Wave 1 data were further examined for the proportion of horse/dog race and sports gamblers who participated using one or more modes of access. Table 14 shows that no gamblers exclusively participated in horse/dog race betting via offshore online/remote methods, 5% participated exclusively online with the New Zealand TAB, and one person (0.2%) participated exclusively online either within New Zealand or with offshore sites. Other participants who gambled online did so along with betting at the New Zealand TAB or race track. A similar profile was noted for sports bettors with 2% gambling exclusively via offshore online/remote methods, 7% online at the New Zealand TAB and 0.8% (2 people) exclusively online in New Zealand or offshore. The majority of horse/dog race and sports bettors did so using terrestrial modes of access (at the track/sports event or the TAB in NZ). A higher percentage of people participated in New Zealand horse/dog race betting than sports betting.

Table 11: Wave 1 prevalence of horse/dog race and sports gambling in New Zealand and offshore

	Wave 1 (2012, baseline) N=6,251									
	New Zealand						Offshore			
	Event venue On-site		TAB On-site		TAB Online/Remote		Online/Remote		*Total*	
TAB activity	**%**	**(95% CI)**	**%**	**(95% CI)**	**%**	**(95% CI)**	**%**	**(95% CI)**	***%***	***(95% CI)***
Horse/dog race betting	8.00	(7.17, 8.84)	7.70	(6.90, 8.49)	2.91	(2.37, 3.45)	0.41	(0.21, 0.62)	*11.71*	*(10.73, 12.69)*
Sports betting	2.81	(2.27, 3.34)	2.86	(2.31, 3.42)	1.85	(1.38, 2.32)	0.35	(0.15, 0.55)	*4.59*	*(3.90, 5.29)*
Any activity	*9.74*	*(8.82, 10.66)*	*9.16*	*(8.28, 10.04)*	*3.69*	*(3.09, 4.19)*	*0.73*	*(0.45, 1.01)*	*13.56*	*(12.51, 14.62)*

Data weighted for 2013 Census data and sampling weights

Table 12: Wave 2 prevalence of horse/dog race and sports gambling in New Zealand and offshore

	Wave 2 (2013) N=3,745									
	New Zealand						Offshore			
	Event venue On-site		TAB On-site		TAB Online/Remote		Online/Remote		*Total*	
TAB activity	**%**	**(95% CI)**	**%**	**(95% CI)**	**%**	**(95% CI)**	**%**	**(95% CI)**	***%***	***(95% CI)***
Horse/dog race betting	6.11	(5.10, 7.12)	6.91	(5.88, 7.94)	2.61	(1.88, 3.33)	0.34	(0.11, 0.57)	*10.51*	*(9.28, 11.74)*
Sports betting	1.56	(1.10, 2.01)	1.74	(1.24, 2.25)	0.81	(0.47, 1.13)	0.25	(0.01, 0.48)	*2.74*	*(2.12, 3.37)*
Any activity	*7.17*	*(6.11, 8.24)*	*7.76*	*(6.69, 8.83)*	*2.88*	*(2.13, 3.62)*	*0.53*	*(0.22, 0.84)*	*11.57*	*(10.30, 12.84)*

Data weighted for 2013 Census data, sampling weights and attrition by age, gender, ethnicity and PGSI category at Wave 1

Table 13: Wave 3 prevalence of horse/dog race and sports gambling in New Zealand and offshore

	Wave 3 (2014) N=3,115									
	New Zealand						Offshore			
	Event venue On-site		TAB On-site		TAB Online/Remote		Online/Remote		*Total*	
TAB activity	**%**	**(95% CI)**	**%**	**(95% CI)**	**%**	**(95% CI)**	**%**	**(95% CI)**	***%***	***(95% CI)***
Horse/dog race betting	5.35	(4.42, 6.28)	6.29	(5.33, 7.24)	2.02	(1.46, 2.86)	0.37	(0.04, 0.70)	9.41	(8.22, 10.60)
Sports betting	1.75	(1.13, 2.38)	1.65	(1.08, 2.21)	1.08	(0.65, 1.52)	0.25	(0.06, 0.43)	2.93	(2.16, 3.69)
Any activity	*6.54*	*(5.50, 7.59)*	*7.26*	*(6.22, 8.30)*	*2.70*	*(2.04, 3.36)*	*0.56*	*(0.19, 0.92)*	*10.83*	*(9.54, 12.11)*

Data weighted for 2013 Census data, sampling weights and attrition by age, gender, ethnicity and PGSI category from Wave 1 to Wave 2

Table 14: Horse/dog race and sports gambling by mode of access

NZ event venue On-site	NZ TAB On-site	NZ TAB Online/remote	Offshore Online/Remote	n	%
Horse/dog race betting					
-	-	-	Yes	0	-
-	-	Yes	-	37	5.1
-	-	Yes	Yes	1	0.2
-	Yes	-	-	163	22.2
-	Yes	-	Yes	4	0.6
-	Yes	Yes	-	24	3.3
-	Yes	Yes	Yes	2	0.3
Yes	-	-	-	183	25.0
Yes	-	-	Yes	3	0.4
Yes	-	Yes	-	26	3.6
Yes	-	Yes	Yes	0	-
Yes	Yes	-	-	190	25.9
Yes	Yes	-	Yes	7	1.0
Yes	Yes	Yes	-	83	11.4
Yes	Yes	Yes	Yes	8	1.0
Total				*732*	*100.0*
Sports betting					
-	-	-	Yes	5	1.9
-	-	Yes	-	21	7.2
-	-	Yes	Yes	2	0.8
-	Yes	-	-	52	18.3
-	Yes	-	Yes	3	1.1
-	Yes	Yes	-	27	9.2
-	Yes	Yes	Yes	1	0.4
Yes	-	-	-	33	11.6
Yes	-	-	Yes	2	0.8
Yes	-	Yes	-	43	14.8
Yes	-	Yes	Yes	1	0.5
Yes	Yes	-	-	74	25.9
Yes	Yes	-	Yes	0	-
Yes	Yes	Yes	-	15	5.2
Yes	Yes	Yes	Yes	6	2.2
Total				*287*	*100.0*

Data weighted for 2013 Census data and sampling weights

4.2 Participation by socio-demographic variables and gambling behaviour

Wave 1 (baseline) data pertaining to gambling participation by specific socio-demographic variables (i.e. gender, age, ethnicity and individual deprivation level) and by gambling behaviour are presented in this section. Modes excluding horse/dog race and sports gambling have been presented in section 4.2.1, with horse/dog race and sports betting data presented in section 4.2.2. *Note that due to very small sample sizes in some of the cells that all the results detailed below should be treated with caution and should be considered indicative rather than absolute.*

4.2.1 Participation in modes excluding horse/dog race and sports gambling

Data are presented in Appendix 2 for the different modes of gambling and by the different access means (e.g. on-site or online/remote, NZ or offshore).

Socio-demographic variables

There were no major differences noted between commercial poker gamblers who gambled in New Zealand venues or on offshore online sites. A majority were male (about four-fifths), aged 34 years or younger (bout three-quarters), and of European/Other descent (about two-thirds). About a quarter of poker players were of Māori descent. A majority of poker players had no or low individual levels of deprivation.

Raffle/lottery gamblers (gambling in NZ or offshore) and New Zealand Lotto gamblers (on-site and online gambling) also did not show any major differences between the participants based on where the gambling was conducted. However, they had a different profile from poker players. There was a more even gender split, and a more even distribution across the age groups although the smallest proportion (< 10%) was for the youngest age group (18-24 years). About three-quarters were European/Other and about 12% were Māori. Similar to poker gamblers, a majority of raffle/lottery and Lotto gamblers had no or low individual levels of deprivation.

Keno gamblers (both in-venue and online in NZ) had a similar profile to raffle/lottery/Lotto gamblers with some notable differences. The youngest age group were more likely to play keno online (13%) than buy a ticket in-store (6%), and participants aged 55 years or older were less likely to participate online (<10%) than buying in-store (about 19%). A slightly higher proportion of European/Other and Asians participated online in comparison to those participating in-store; the converse was true for Māori and Pacific people.

There were no major differences noted between casino gamblers who gambled in New Zealand venues or in offshore venues. They had a relatively even gender and age group split, though a slightly greater proportion of people aged 25-34 years was likely to participate compared with the other age groups. A majority of casino gamblers were European/Other (71% and 81% for NZ and offshore respectively). A majority had no or low individual levels of deprivation. A similar profile was noted for other offshore online gamblers with some differences. Other offshore online gamblers were more likely to be aged 18-44 years (90%) with 66% European/ Other and 21% Māori.

Gambling behaviour

A difference noted between commercial poker gamblers who gambled in New Zealand venues or on offshore online sites was that a higher proportion of online gamblers were regular[24] gamblers on continuous modes[25] of gambling (53% vs. 30%). A majority of both New Zealand land-based and offshore online poker gamblers participated in multiple gambling activities (four or more) and spent $101 or more monthly on any gambling.

Raffle/lottery (NZ and offshore) and New Zealand Lotto gamblers were similar whether they took part in land-based or online gambling. They generally participated in more than one gambling activity (though were less likely to participate in 7 or more) and a majority were

[24] Weekly or more often.
[25] A continuous mode of gambling is one where there is rapid turnaround between laying the stake and knowing the outcome (e.g. EGMs).

infrequent gamblers or regular non-continuous[26] gamblers. They had varied total monthly gambling expenditure though only a very small percentage (< 6%) spent more than $500; New Zealand online Lotto gamblers were less slightly likely to have lower monthly expenditure than land-based counterparts.

The profile of keno gamblers was different. A majority (in-store and online in NZ) gambled on more than two activities with the greatest proportion being three to nine gambling activities. One-quarter (26%) of in-store keno gamblers and one-fifth (21%) of online keno gamblers were regular continuous gamblers although the majority were infrequent or regular non-continuous gamblers. A majority (in-store and online) had total monthly gambling expenditure of $51 or more.

Casino gamblers were similar whether they took part in New Zealand or offshore land-based gambling. A majority gambled on more than one activity with the greatest proportion being four to nine gambling activities. The majority (at least two-thirds) were infrequent gamblers with about two-fifths (43%) reporting a total monthly gambling expenditure of $101-$500. A similar profile was noted for other offshore online gamblers though it is of note that no participants only gambled this way.

Problem gambling severity

The profile of poker players was different dependent on whether they participated in commercial venues or online. A majority of New Zealand commercial venue poker players were non-problem gamblers (61%) with 13% categorised as moderate-risk gamblers and 3.7% as problem gamblers. Conversely, 14% of offshore online poker players were problem gamblers and a further 11% were moderate-risk gamblers. The proportion of low-risk gamblers (40%) was also substantially higher than for venue gamblers (23%).

The majority (about 90%) of raffle/lottery (NZ and offshore) and New Zealand Lotto gamblers were non-problem gamblers with less than one percent of participants categorised as problem gamblers. A slightly different profile was noted for keno gamblers (NZ) with about three-quarters being non-problem gamblers, about 7% moderate-risk gamblers and 2.9%/1.4% problem gamblers (in-store/online respectively).

About three-quarters of casino gamblers (land-based, NZ and offshore) were non-problem gamblers and just more than 2% were problem gamblers. A greater proportion of New Zealand casino gamblers was categorised as moderate-risk gambler (8.4%) than offshore casino gamblers (3.7%). The problem gambling profile of other offshore online gamblers was, however, quite different. Although slightly less than three-quarters (73%) were non-problem gamblers, 12% were categorised as problem gamblers, 4.5% as moderate-risk gamblers and 11% were low-risk gamblers.

4.2.2 Participation in horse/dog race and sports gambling

Data are presented in Appendix 3 for horse/dog race gambling and sports betting gambling by the different access means (e.g. NZ venue on-site, NZ TAB, NZ TAB online/remotely or offshore online/remotely).

[26] A non-continuous mode of gambling is one where there is a time lag between laying the stake and knowing the outcome (e.g. lotteries).

Socio-demographic variables

There was a relatively even gender split for participation in horse/dog race betting via on-site (at an event) and offshore online/remote means. However, for horse/dog race betting online via the New Zealand TAB and at a TAB in person, more males (70% and 60% respectively) participated in this way than females (30% and 40%). Generally similar proportions for the different age groups participated via the difference access modes in New Zealand. However for offshore online/remote gambling almost two-thirds were aged between 45 and 64 years. A majority (at least four-fifths) were European/Other and about 10% were Māori. The majority of participants had no or low individual levels of deprivation.

A different profile was noted for sports bettors whereby across all the modes of access, males predominated (about three-quarters or more). Male sports bettors were more likely (about three-quarters) to be younger, aged 18-44 years. A majority (just less than three-quarters) were European/Other and about 15% were Māori apart from offshore online/remote betting (10%). Asians were more likely to participate in offshore online/remote sports betting (13%) than via New Zealand modes of access (5% - 9%). The majority of participants had no or low individual levels of deprivation.

Gambling behaviour

Most horse/dog race bettors participated in more than one gambling activity with a substantial proportion gambling on four to nine different activities. Sixty percent of participants who gambled at the track were infrequent gamblers; just less than half of participants who gambled at the TAB or online in New Zealand were infrequent gamblers. For offshore online/remote horse/dog race gamblers, 40% were infrequent gamblers, more than one-third (36%) were regular continuous gamblers and one-quarter (25%) were regular non-continuous gamblers. The greatest participation across all modes of access was at least weekly, with this being the highest (61%) for offshore online/remote gambling. The highest proportion of New Zealand horse/dog race gamblers had a total monthly gambling expenditure of $51-$500; a quarter (26%) of offshore online/remote gamblers spent more than $500 per month. On the whole, sports betting participants showed a generally similar (though not identical) profile to horse/dog betting participants.

Problem gambling severity

A majority (four-fifths or more) of horse/dog race bettors (excluding NZ online gambling) were non-problem gamblers and a small proportion were problem gamblers (1% or less). However, horse/dog race bettors who gambled in New Zealand online showed a marginally different profile with slightly less non-problem gamblers (75%) and slightly more problem gamblers (1.3%), moderate-risk gamblers (7.7% vs 6.5% or less) and low risk gamblers (16% vs. 14% or less).

For sports bettors, participants gambling via offshore online/remote modes were much less likely to be non-problem gamblers (51%) and more likely to be moderate-risk (28%) or low-risk gamblers (21%). Interestingly, there were no problem gamblers; however, this could be an artefact of very small sample sizes and thus the results should be treated with caution.

4.3 New Zealand and offshore gambling expenditure

Data pertaining to gambling expenditure on modes excluding horse/dog race and sports gambling have been presented in Appendix 4 for the three waves. Similar data specifically pertaining to horse/dog race betting and sports betting are presented separately below in Table 15, Table 16 and Table 17.

4.3.1 Expenditure on modes excluding horse/dog race and sports gambling

In Wave 1, the highest median monthly per person expenditure was on casino gambling (table games and EGMs) at $28. The next highest median monthly expenditure was $19 for housie/ bingo and other offshore online gambling, and $18 for commercial poker and pub/club EGM gambling. Median monthly expenditure on Lotto was $16. Expenditure on poker gambling in a private residence and on keno was lower at $10 and $6 respectively (Appendix 4).

Median monthly per person expenditure on casino gambling increased in Wave 2 to $35 and remained at this level in Wave 3. An increase in median expenditure was noted for housie/bingo in Waves 2 and 3 ($20 and $23), and for poker gambling in a private residence ($14 and $17). However, a *decrease* in median monthly expenditure was noted for other offshore online gambling over time Wave 2 ($8) which remained at this level in Wave 3. Expenditure on pub or club EGMs was stable over time ($18 at each wave); keno gambling expenditure also remained stable ($5 at each wave). Median monthly expenditure on Lotto bought in a store or online was similar in all three waves (about $15). The median monthly expenditure for commercial poker gambling showed fluctuation over time, increasing to $22 in Wave 2 and then reducing back to $18 in Wave 3 (Appendix 4). However, as sample sizes were very small, these values should be treated with caution as they could be an artefact of low numbers of participants.

4.3.2 Expenditure on horse/dog race and sports gambling

In Wave 1, the overall median monthly per person expenditure on horse/dog race and sports gambling combined was $25, with a median of $22 on horse/dog race betting and $17 spent on sports betting. Of the horse/dog race bettors, the median monthly expenditure for gambling online/remotely with the New Zealand TAB was $16, and for online/remote betting with offshore TABs/betting organisations it was $17. For sports bettors the amounts were $9 vs. $8 for New Zealand vs. offshore online/remote betting. Overall, median monthly expenditure on online/remote gambling with the New Zealand TAB was $17 vs. $10 for offshore online/ remote betting (Table 15).

In Waves 2 and 3, overall combined horse/dog race and sports gambling median monthly per person expenditure remained relatively stable compared with Wave 1. This was also true for the median amount spent on New Zealand online/remote TAB gambling overall. However, for offshore online/remote gambling on horse/dog race and sports betting combined, the overall median expenditure slightly increased over time from $10 in Wave 1 to $12 in Wave 2 and $15 in Wave 3. There was no trend to explain this overall increase, with median horse/dog race betting expenditure decreasing in Wave 2 from Wave 1 and then slightly increasing in Wave 3, and sports betting expenditure increasing in Wave 2 from Wave 1 then slightly decreasing in Wave 3 (Table 16 and Table 17).

However, due to small sample sizes these findings should be considered indicative only and could be artefacts of the small number of participants.

Table 15: Wave 1 median monthly expenditure for horse/dog race and sports gambling in New Zealand and offshore

	Wave 1 (2012, baseline) N=6,251									
	New Zealand						Offshore			
	Event venue On-site		TAB On-site		TAB Online/Remote		Online/Remote		*Total*	
Activity	**Median $**	**(Standard Error)**	**Median $**	**(Standard Error)**	**Median $**	**(Standard Error)**	**Median $**	**(Standard Error)**	***Median $***	***(Standard Error)***
Horse/dog race betting	19.60	(2.23)	14.02	(1.80)	15.85	(2.02)	17.17	(8.77)	*21.73*	*(2.19)*
Sports betting	9.16	(0.57)	9.12	(0.97)	9.13	(1.22)	8.16	(0.81)	*17.05*	*(1.80)*
Any activity	*19.41*	*(2.22)*	*16.15*	*(1.80)*	*16.95*	*(1.97)*	*9.86*	*(1.69)*	*24.63*	*(2.29)*

Data weighted for 2013 Census data and sampling weights; NZRB = New Zealand Racing Board
Excludes one response of $40,000 for horse/dog race betting on-site and $100,000 for horse/dog race betting offshore (note, same person)

Table 16: Wave 2 median monthly expenditure for horse/dog race and sports gambling in New Zealand and offshore

	Wave 2 (2013) N=3,745									
	New Zealand						Offshore			
	Event venue On-site		TAB On-site		TAB Online/Remote		Online/Remote		*Total*	
Activity	**Median $**	**(Standard Error)**	**Median $**	**(Standard Error)**	**Median $**	**(Standard Error)**	**Median $**	**(Standard Error)**	***Median $***	***(Standard Error)***
Horse/dog race betting	19.95	(2.52)	18.39	(2.21)	17.03	(2.64)	6.46	-	*24.25*	*(2.54)*
Sports betting	12.71	(2.31)	12.50	(2.07)	8.89	(1.13)	13.77	-	*19.05*	*(2.29)*
Any activity	*19.74*	*(2.40)*	*18.57*	*(2.18)*	*17.38*	*(2.69)*	*11.85*	*(6.14)*	*28.17*	*(2.99)*

Data weighted for 2013 Census data, sampling weights and attrition by age, gender, ethnicity and PGSI category at Wave 1; NZRB = New Zealand Racing Board
Excludes one response of $200,000 for horse/dog race betting offshore
- Standard Error not calculable due to sample size of less than 3

Table 17: Wave 3 median monthly expenditure for horse/dog race and sports gambling in New Zealand and offshore

	Wave 3 (2014) N=3,115									
	New Zealand						Offshore			
	Event venue On-site		TAB On-site		TAB Online/Remote		Online/Remote		*Total*	
Activity	**Median $**	**(Standard Error)**	**Median $**	**(Standard Error)**	**Median $**	**(Standard Error)**	**Median $**	**(Standard Error)**	***Median $***	***(Standard Error)***
Horse/dog race betting	19.49	(3.34)	17.02	(2.02)	17.49	(2.63)	9.09	-	*19.49*	*(2.04)*
Sports betting	8.20	(0.99)	7.62	(1.01)	9.15	(1.15)	9.04	-	*16.68*	*(2.28)*
Any activity	*19.13*	*(2.73)*	*16.82*	*(2.03)*	*16.73*	*(2.60)*	*14.70*	-	*19.40*	*(1.98)*

Data weighted for 2013 Census data, sampling weights and attrition by age, gender, ethnicity and PGSI category from Wave 1 to Wave 2; NZRB = New Zealand Racing Board
- Standard Error not calculable due to sample size of less than 3

4.4 Associated factors for offshore or online/remote gambling

This section details the results of inferential analyses of Wave 1 data identifying associated factors with participation in the various modes of gambling offshore[27] or online/remotely in New Zealand in comparison to equivalent gambling within venues in New Zealand. Problem gambling severity level (PGSI) was not a predictive factor in any of the analyses.

Note that due to small sample sizes for many of the modes of gambling, that the results should be considered indicative only.

4.4.1 Gambling modes excluding horse/dog race and sports gambling

Data are presented in Appendix 5.

Commercial poker offshore

Bivariate associations examined using logistic regression indicated that gambling at a high frequency (at least monthly or more often) was associated with statistically significant *increased* odds of gambling on commercial poker via offshore online/remote methods compared with commercial poker gambling (land-based) in New Zealand.

Being a migrant, religious, experiencing only one major life event in the past year, and not using illegal drugs were statistically significantly associated with *lower* odds of offshore online commercial poker gambling.

However, gambling frequency, country of birth, number of major life events and illegal drug use did not achieve a level of statistical significance in the multiple logistic regression analyses and are of little importance as they are likely to be due to confounding from other variables.

Multiple logistic regression analyses showed that being *unemployed* was statistically significantly associated with greater odds of offshore online poker gambling (15.11 times greater) compared with being employed. Having a *quality of life* below the median value was also associated with increased odds for online gambling on commercial poker offshore (8.42 times greater) than having a higher than median quality of life. Multiple logistic regression analyses also showed that having *a vocational or trade qualification or university level qualifications* were statistically significantly associated with increased odds for offshore online commercial poker gambling (5.90 and 4.19 times respectively) compared with people with no formal or lower level qualifications. Although these statistical significances were not noted in the bivariate analyses, similar trends were apparent.

Being *religious* remained statistically significantly associated with lower odds of offshore online poker gambling (odds ratio of 0.10) compared with not being religious.

Raffle/lottery offshore

Bivariate associations examined using logistic regression indicated that being a recent migrant (since 2008), religious, gambling on three or more activities, being a regular non-continuous or

[27] Analyses have not been performed for other offshore online gambling due to the lack of a comparative New Zealand based group.

regular continuous gambler, gambling at a high frequency (at least monthly or more often), having a total monthly gambling expenditure of $11 or more, separating gambling money from other money, leaving automated teller machine (ATM) and credit cards at home when gambling, and having a high level of psychological distress were associated with statistically significant *increased* odds of gambling on offshore raffles/lotteries (land-based and online) compared with raffle/lottery gambling (land-based) in New Zealand.

Living in a household of four people, living outside the three major cities[28], having the highest levels (5 or more) of individual deprivation, and ever having smoked tobacco were statistically significantly associated with *lower* odds of offshore raffle/lottery gambling (land-based and online).

However, religion, household size, gambling frequency and expenditure, separating gambling money or leaving ATM and credit cards at home, and psychological distress did not achieve a level of statistical significance in the multiple logistic regression analyses and are of little importance as they are likely to be due to confounding from other variables.

Multiple logistic regression analyses showed that being a *recent migrant* remained statistically significantly associated with increased odds for offshore (land-based and online) raffle/lottery gambling (9.07 times greater) compared with being New Zealand born. *Gambling on three or more activities* also remained associated with increased odds for gambling on raffles/lotteries (land-based and online) offshore (3.22 to 39.62 times greater increasing with greater number of activities) than gambling on one or two activities. Being a regular non-continuous gambler (but not a regular continuous gambler) remained statistically significantly associated (1.72 times greater odds) too compared with infrequent gamblers.

Living outside the three major cities remained statistically significantly associated with lower odds (odds ratio of 0.65) for offshore raffle/lottery gambling (land-based and online) compared with living in Auckland. Having the highest levels (5 or more) of *individual deprivation* also remained statistically significantly associated with lower odds (odds ratio of 0.15) compared to people with no deprivation. A similar association remained for having smoked tobacco (odds ratio of 0.61) compared with people who had never smoked tobacco.

Multiple logistic regression analyses also showed that being *aged 55 years or older* was statistically significantly associated with increased odds (2.5 to 2.9 times) for offshore raffle/ lottery gambling (land-based and online) compared with people aged 18-24 years. Although the statistical significance was not noted in the bivariate analyses, a similar trend was apparent.

Lotto online (NZ)

Bivariate associations examined using logistic regression indicated that being Asian, a migrant, having any form of qualification, living in a household of three or more people, having an annual personal or household income of $60,001-$80,000, $80,001-$100,000 (household income only) or more than $100,000, gambling on seven to nine activities, being a regular non-continuous gambler, having a gambling frequency of at least monthly or more often, having a monthly gambling expenditure of at least $31, setting a dollar amount for gambling before leaving home, and not using illegal drugs, were associated with statistically significant *increased* odds of gambling on New Zealand Lotto online compared with in-store Lotto gambling.

[28] Auckland, Wellington and Christchurch.

Being aged 55 years or older, living in Christchurch, having four or more levels of individual deprivation, not having a method to manage gambling, having a below median quality of life, having a low-mid or high level of psychological distress, using cannabis, and ever having smoked tobacco were statistically significantly associated with *lower* odds for gambling on New Zealand Lotto online.

However, household size, personal and household income, area of residence, level of individual deprivation, gambling status and frequency, methods for managing gambling including setting a dollar limit, quality of life, and cannabis use did not achieve a level of statistical significance in the multiple logistic regression analyses and are considered to be of little importance as they are likely to be due to confounding from other variables.

Multiple logistic regression analyses showed that being a *migrant* remained statistically significantly associated with increased odds for New Zealand online Lotto gambling (1.84 times greater) compared with being New Zealand born. Having *secondary school or university level qualifications* also remained statistically significantly associated (2.01 and 3.16 times respectively) compared with having no formal qualifications. *Total monthly gambling expenditure* of $31 or more retained a statistically significant association with New Zealand online Lotto gambling with odds ratios increasing with increased expenditure (4.51 to 10.97 times) compared with monthly expenditure of $1-$10. Not using illegal drugs also retained its association with New Zealand online Lotto gambling (2.12 times greater) compared with people who used drugs.

Being of an older age (45 years and older) was statistically significantly associated with lower odds for New Zealand online Lotto gambling in the multiple logistic regression analyses (odds ratios of 0.24 to 0.38) compared with being aged 18-24 years. The statistical significance for Asian ethnicity was not retained in the multiple logistic regression analyses; however, being of *Pacific* ethnicity was statistically significantly associated with *lower* odds for gambling on New Zealand Lotto online (odds ratio 0.34) compared with European/Other. *Gambling on three or more activities* retained statistical significance for lower odds (about 0.5 times) compared to gambling only on one activity; although confidence intervals overlapped 1.00 for seven or more gambling activities, that could be due to small sample sizes - the odds ratios were similar to those gambling on three or four to six activities. Having a higher psychological distress (upper half of scores) remained associated with less New Zealand online Lotto gambling (odds ratios of 0.21 and 0.51) compared with people with low levels of psychological distress. Ever having smoked tobacco also retained its lower odds association (odds ratio of 0.72) in comparison with people who had never smoked tobacco.

Casino offshore

Bivariate associations examined using logistic regression indicated that an annual personal income of $80,001 or more, living in Wellington, and gambling on seven or more activities were associated with statistically significant *increased* odds of offshore casino gambling (land-based) compared with New Zealand casino gambling.

Being of Pacific or Asian ethnicity, having individual levels of deprivation of three or five or more, getting someone they trust to manage their money, ever smoked more than 100 cigarettes in lifetime, ever smoked daily for a period of time, and currently smoke at least once a week were statistically significantly associated with *lower* odds for offshore casino gambling (land-based).

However, ethnicity, getting someone they trust to manage their money, ever smoked more than 100 cigarettes in lifetime, and ever smoked daily for a period of time did not achieve a level of

statistical significance in the multiple logistic regression analyses and are considered to be of little importance as they are likely to be due to confounding from other variables.

Multiple logistic regression analyses showed that having an *annual personal income* of more than $100,000 remained statistically significantly associated with increased odds for land-based offshore casino gambling (2.62 times greater) compared with having a personal income of less than $20,000. A similar association was noted for people earning $80,001-$100,000 although the confidence interval crossed 1.00. People *living in Wellington* also remained statistically significant with 4.03 times greater odds than people living in Auckland. The statistically significant increased odds for offshore casino gambling (land-based) also remained for people *gambling on seven to nine activities* (6.79 times greater) or *10 more activities* (37.23 times greater), compared with people who gambled on only one activity. However, due to small sample sizes these findings should be treated as indicative rather than absolute.

Having an individual *deprivation level* of three remained statistically significantly associated with lower odds for offshore casino gambling (land-based) in the multiple logistic regression analyses (odds ratios of 0.21) compared with having no deprivation. *Smoking at least once a week* also retained its association with lower odds (odds ratio of 0.46) compared with people who had never smoked.

Setting a dollar amount for gambling before leaving home (compared with people who did not use this method for controlling gambling) and having the *most enjoyable mode of* gambling being other than casino gambling (compared with not having a most enjoyable mode of gambling) were also statistically significantly associated with lower odds (odds ratio of 0.60 and 0.41 respectively) for land-based offshore casino gambling in comparison to New Zealand land-based casino gambling; although these findings just failed to attain a level of statistical significance in the bivariate analyses, similar trends had been noted.

4.4.2 Horse/dog race and sports gambling

Data are presented in Appendix 6.

Horse/dog race betting - online/remote (NZ and offshore combined)

Bivariate associations examined using logistic regression indicated that males, gambling on seven or more activities, being a regular continuous gambler, having a gambling frequency of at least monthly or more often, having a total monthly gambling expenditure of $101 or more, being a low-risk or moderate-risk gambler, getting someone they trust to manage their money, and using cannabis were associated with statistically significant *increased* odds of New Zealand and offshore online/remote horse/dog race gambling compared with horse/dog race betting via other methods in New Zealand.

Migrants particularly those who arrived before 2008, being religious, having any mode of gambling as most enjoyable, not having a method to manage gambling, and not using illegal drugs were statistically significantly associated with *lower* odds for online/remote horse/dog race gambling (NZ and offshore).

However, gender, number of gambling activities participated in, frequency of gambling, problem gambling severity level, having methods to manage gambling including getting someone they trust to manage their money, and using illegal drugs including using cannabis did not achieve a level of statistical significance in the multiple logistic regression analyses and are considered to be of little importance as they are likely to be due to confounding from other

variables. Although annual household income achieved a level of statistical significance in the multiple logistic regression analyses, this finding appeared to be due to the large proportion (45.5%) of online/remote horse/dog race betting participants who did not report their annual income level; this finding, therefore, is considered to be spurious.

Multiple logistic regression analyses showed that participants who were *regular continuous* gamblers had twice the odds (2.02 times greater) for online/remote horse/dog race gambling (NZ and offshore) than infrequent gamblers. Having a *total monthly gambling expenditure* of more than $101 remained statistically significantly associated with increased odds for NZ and offshore online/remote horse/dog race gambling (11.57 and 17.74 times greater for $101-$500 and >$500 respectively) compared with having a monthly expenditure of $1-$10. However, due to small sample sizes these findings should be treated as indicative rather than absolute.

Being a *migrant* remained statistically significantly associated with lower odds for online/ remote horse/dog race gambling (NZ and offshore) in the multiple logistic regression analyses (odds ratios of 0.43) compared with New Zealand born participants. Being *religious* compared with not being religious also remained statistically significant (odds ratio of 0.57). Having any mode of gambling (other than horse/dog race betting, or horse/dog race betting) as most *enjoyable* also remained statistically significantly associated with lower odds for NZ and offshore online/remote horse/dog race betting (odds ratios of 0.27 and 0.35 respectively) compared with participants who did not have a most enjoyed mode of gambling.

Sports betting - online/remote (NZ and offshore combined)

Bivariate associations examined using logistic regression indicated that separating money for gambling from other money vs. not doing so was associated with statistically significant *increased* odds of New Zealand and offshore online/remote sports betting compared with sports betting via other methods in New Zealand.

Being religious, not having a method to manage gambling, and ever having smoked more than 100 cigarettes in lifetime were statistically significantly associated with *lower* odds for online/ remote sports betting (NZ and offshore). However, not having a method to manage gambling did not achieve a level of statistical significance in the multiple logistic regression analyses; it is thus considered to be of little importance as it is likely to be due to confounding from other variables.

In the multiple logistic regression analyses, *separating money for gambling from other money* vs. not doing so remained statistically significantly associated with increased odds (odds ratio of 6.04) of New Zealand and offshore online/remote sports betting compared with sports betting via other methods. Being *religious* compared with not being religious and e*ver having smoked 100 cigarettes in lifetime* compared with not having ever smoked 100 cigarettes both continued to be statistically significantly associated with lower odds (odds ratio of 0.44 and 0.47 respectively) in the multiple logistic regression analyses.

Horse/dog race and sports betting combined - online/remote (offshore)

Due to very small sample sizes, it was not possible to conduct inferential analyses of online/ remote offshore horse/dog race betting and sports betting separately. Thus these analyses have been conducted on data for these two modes of offshore gambling combined. Despite this, sample sizes still remained very small so all findings should be treated with caution and be considered indicative only.

Bivariate associations examined using logistic regression indicated that living with at least one other person (household size greater than one), having an annual household income of $20,001 or more, and having a total monthly gambling expenditure of more than $500 were associated with statistically significant *increased* odds of offshore online/remote horse/dog race and sports gambling combined compared with horse/dog race and sports gambling via other methods in New Zealand. Participants who set a time limit for gambling also had greater odds for gambling offshore online/remotely; however, the confidence intervals are wide and span 1.00 so this finding is likely to be an artefact of small sample size.

Ever having smoked tobacco vs. never having smoked tobacco was statistically significantly associated with *lower* odds for offshore online gambling compared with combined horse/dog race and sports gambling by other methods.

However, household size, annual household income, setting a time limit for gambling, and ever smoking tobacco did not achieve a level of statistical significance in the multiple logistic regression analyses and are considered to be of little importance as they are likely to be due to confounding from other variables.

Total monthly *gambling expenditure* of more than $500 compared with expenditure of $1-$50 continued to be statistically significantly associated with increased odds (13.27 times greater) in the multiple logistic regression analyses. Additionally, *migrants* had statistically significant greater odds (2.55 times) for offshore gambling online/remotely compared with New Zealand born participants in the multiple logistic regression analyses. This finding did not reach a level of statistical significance in the bivariate analyses; however, a similar trend was apparent.

4.5 Transitions over time

This section details changes in online or remote interactive gambling participation over the three waves of the NGS. It details transitions into and out of gambling participation for different modes of gambling. Overall gambling participation, online Lotto gambling (NZ), online/ remote horse or dog race betting (NZ and offshore combined), online/remote sports betting (NZ and offshore combined), and online/remote horse/dog race and sports gambling combined (offshore only) are presented.

4.5.1 Overall gambling participation

Of the 80% of participants who gambled in the past year in Wave 1, 88.5% were still gambling in Wave 2 (11.5% stopped gambling) and of those, 91% continued gambling in Wave 3 indicating that most gamblers carried on gambling over time. Of the 20% non-gamblers in Wave 1, 35% were gambling in Wave 2 and of those, 59% continued gambling in Wave 3. This shows that a third of past year non-gamblers took up gambling and then a majority of those continued gambling into Wave 3. The lost-to-follow-up proportion remained similar for the different gambling states in each wave indicating that differential attrition was not an issue for overall gambling participation (Table 18).

Table 18: Transition across time for overall gambling participation

Wave 1	Wave 2	Wave 3	Wave 1		Wave 2			Wave 3		
			n*	%	n*	% Change	% Drop Out	n*	% Change	% Drop Out
No	No	No	1261	20.3%	485	64.7%	-	307	75.9%	-
		Yes						97	24.1%	-
		LFU						80	-	16.6%
	Yes	No			264	35.3%	-	89	40.6%	-
		Yes						130	59.4%	-
		LFU						44	-	16.8%
	LFU	-			513	-	40.6%	-	-	-
Yes	No	No	4990	79.7%	343	11.5%	-	133	47.2%	-
		Yes						148	52.8%	-
		LFU						62	-	18.2%
	Yes	No			2654	88.5%	-	199	9.0%	-
		Yes						2020	91.0%	-
		LFU						435	-	16.4%
	LFU	-			1993	-	39.9%	-	-	-

* Adjusted for sample weightings and attrition, where relevant
LFU=Lost to follow-up

4.5.2 Lotto online

Data are presented in Appendix 7.

Of the 4.9% of participants who gambled on Lotto online through the New Zealand MyLotto website in Wave 1, 60% continued doing so in Wave 2, and 86.5% in Wave 3. A small percentage of Lotto participants who did not gamble online in Wave 1 started gambling online in Wave 2 (4%) with just over half (54%) continuing to do so in Wave 3. A similar pattern was noted for people who did not gamble on Lotto but who gambled on other modes, or who were non-gamblers in Wave 1; of these people a very small percentage started gambling on Lotto online in Wave 2 and then the majority continued to do so in Wave 3. Thus, a majority of participants who gambled on Lotto online continued to do so over time. Note that for some cells, sample sizes were very small so the findings should be considered indicative rather than absolute in terms of the percentages presented. The lost-to-follow-up proportion remained similar for the different gambling states in each wave indicating that differential attrition was not an issue for online Lotto participation.

4.5.3 Horse or dog race betting online/remote (NZ and offshore)

Data are presented in Appendix 7.

Of the 3.1% of participants who gambled on horse/dog races online/remotely in New Zealand or offshore in Wave 1, less than half (46%) continued doing so in Wave 2, with two-thirds of those (65%) continuing to do so in Wave 3. A small percentage of horse/dog race betting participants who did not gamble online/remotely in Wave 1 started gambling online/remotely in Wave 2 (8%) with about a third (37%) continuing to do so in Wave 3. A broadly similar pattern was noted for people who did not gamble on horse/dog races but who gambled on other modes, or who were non-gamblers in Wave 1. Of these people a very small percentage started gambling on horse/dog races online/remotely in Wave 2 and then the majority continued to do so in Wave 3; however, sample sizes for these two groups of participants were very small and findings should be treated with caution. The lost-to-follow-up proportion remained similar for the different gambling states in Wave 2 but there was an indication in Wave 3 that a greater

proportion of participants who gambled on horse/dog races in Wave 1 (not online/remotely) who then took up online gambling in Wave 2, were lost-to-follow-up in Wave 3.

Unlike with online Lotto gambling where participants generally continued over time, there was more fluctuation with online/remote horse/dog race gambling in terms of participants starting then stopping using the online/remote method. The majority of online/remote horse/dog race bettors came from participants who gambled on that mode via other (land-based) means.

4.5.4 Sports betting online/remote (NZ and offshore)

Data are presented in Appendix 7.

Of the 2.0% of participants who gambled on sports events online/remotely in New Zealand or offshore in Wave 1, less than half (40.5%) continued doing so in Wave 2, with a similar proportion of those (47%) continuing to do so in Wave 3. A small percentage of sports betting participants who did not gamble online/remotely in Wave 1 started gambling online/remotely in Wave 2 (7%) with about one-fifth (22%) continuing to do so in Wave 3. A broadly similar pattern was noted for people who did not gamble on sports events but who gambled on other modes in Wave 1; of these people a very small percentage started gambling on sports events online/remotely in Wave 2 and then about one-fifth continued to do so in Wave 3. Only one non-gambler from Wave 1 took up online/remote sports betting in Wave 2 but did not continue with this mode of gambling in Wave 3. As sample sizes for these groups of participants were very small, findings should be treated with caution and considered indicative only. The lost-to-follow-up proportion was broadly similar for the different gambling states in each wave.

Thus, initiation and continuation of online/remote sports gambling was broadly similar to that noted for horse/dog race online/remote gambling.

4.5.5 Horse/dog race and sports betting combined - online/remote (offshore)

Data are presented in Appendix 7.

Due to very small sample sizes, it was not possible to investigate transitions of online/remote offshore horse/dog race betting and sports betting separately. Thus these data have been combined. Despite this, sample sizes still remained very small so all findings should be treated with caution and be considered indicative only.

Of the 0.7% of participants who gambled on offshore online/remote horse/dog race and sports gambling combined in Wave 1, less than one-tenth (9%) continued doing so in Wave 2, and none continued to do so in Wave 3 (they were lost-to-follow-up). A small percentage of horse/dog race and sports gamblers combined who did not gamble online/remotely offshore in Wave 1 started doing so in Wave 2 (2%) with about one-quarter (28%) continuing to do so in Wave 3. A broadly similar pattern was noted for people who did not gamble on horse/dog race and sports gambling but who gambled on other modes in Wave 1; of these people a very small percentage started horse/dog race and sports gambling offshore online/remotely in Wave 2 and then about one-third continued to do so in Wave 3. Only one non-gambler from Wave 1 took up offshore online/remote horse/dog race and sports gambling in Wave 2 but did not continue with this mode of gambling in Wave 3. The lost-to-follow-up proportion was broadly similar for the different gambling states in each wave with percentage fluctuations due to small sample sizes.

Thus initiation and continuation of offshore online/remote horse/dog race and sports gambling was broadly similar to that noted for horse/dog race and sports event online/remote gambling (NZ/offshore combined).

4.6 Comparisons with other studies

In this section, comparison of online NGS data is made with Health and Lifestyles Survey (HLS) and Nielsen survey data, where available. The focus is on overall online gambling and TAB gambling, with data on prevalence and expenditure presented.

4.6.1 Prevalence of New Zealand and offshore online gambling

Overall prevalence

The results from the NGS indicated that overall in 2012 (Wave 1), 1.7% of the adult population (18 years and older) participated in some mode of offshore online gambling[29] in the prior 12 months. This decreased to 1.2% in Wave 2 and 0.9% in Wave 3. The Wave 1 (2012) percentage is similar to those reported in the Health and Lifestyle Surveys (HLS) conducted in 2010 and 2012 but is about half the percentage reported in the 2010 Nielsen survey (Table 19). Unfortunately, confidence intervals are not provided for the Nielsen data to see if they overlap with the NGS or HLS data but for reasons discussed in the Discussion and Conclusions chapter, the Nielsen results are likely to be an over-estimation.

Interestingly, the 2014 HLS data[30] indicated an increase in offshore online gambling since 2010 and 2012 with a 4% participation rate compared to the NGS estimate of 0.9% participation. The HLS survey question wording was altered in 2014 for offshore gambling and this could have influenced responses. This is discussed in the Discussion and Conclusions chapter, as is reasoning for the fact that the NGS data could be slightly under-estimating total offshore online gambling participation. The 2015 Nielsen survey[31] also reported an increase in offshore online gambling with a 5.2% participation rate. As detailed in the previous paragraph, this is also likely to be an over-estimation and without confidence intervals provided for the 2010 data it is not possible to know if this is a true increase from their 2010 estimate. However, it is noted that the Nielsen 2015 confidence intervals overlap those from the HLS 2014.

A further consideration is that the confidence intervals over time for the NGS data overlap as do the confidence intervals over time for the HLS data (Table 19). This is probably a result of the very small sample sizes but means that any decrease or increase may, in fact, not be true. The declining trend in point estimates from the NGS over time imply that the decrease could be real but, in fact, both the NGS and HLS results could indicate no change over time.

Full intervention service statistics[32] for the three years indicated that a very small proportion of gamblers seeking treatment cited offshore online/remote gambling as a primary problem gambling mode. The percentages were 2.2% in 2012, 2.1% in 2013 and 2.9% in 2014. These

[29] This excludes offshore online lottery participation as these data are not extractable from the survey question which relates to buying a ticket in an overseas raffle or lottery through an overseas shop, by telephone, through the post or online. The percentage of people who bought an offshore lottery or raffle ticket in this was 3.2% (95% CI 2.7 - 3.7) in 2012, 3.2% (2.6 - 3.8) in 2013, and 3.1% (2.4 - 3.7) in 2014.
[30] Preliminary data provided for this study.
[31] Preliminary data provided for this study.
[32] Data specifically provided for this study.

data suggest that the percentage of people negatively affected by offshore online/remote gambling was relatively stable over time.

Table 19: Percentage of total adult population taking part in offshore online gambling by survey

Offshore online gambling	HLS 2010	Nielsen 2010	HLS 2012	NGS 2012 n=104	NGS 2013 n=46	NGS 2014 n=29	HLS 2014 n=70	Nielsen 2015
Percentage	2.1	3.6	1.4	1.7	1.2	0.9	4.0	5.2
(95% CI)	(0.7, 3.4)		(0.6, 2.6)	(1.2, 2.1)	(0.8, 1.7)	(0.5, 1.3)	(2.4, 5.6)	(4.9, 5.5)

n not available for HLS 2010, Nielsen 2010, HLS 2012 or Nielsen 2015
95% CI not available for Nielsen 2010

The Wave 1 proportion of 1.7% participating in offshore online gambling is equivalent to 59,416 adults aged 18 years and older in the total population (95% CI 44,474 - 74,355). In Wave 2, the population gambling on offshore online modes was 43,538 (1.2%, CI 27,166 - 59,909) and in Wave 3 it was 32,557 (0.9%, CI 17,700 - 47,410).

Horse/dog race and sports gambling prevalence

The percentages of the adult population gambling on offshore and New Zealand online gambling (horse/dog race betting and sports betting overall) was similar between the Nielsen and NGS surveys in 2010 and 2012 respectively, and for the HLS survey (NZ online only) for New Zealand in 2010 (Table 20). These data appear to contradict the previous statement that the Nielsen results are likely to be an overestimation. However, given that the Nielsen sample was predominantly a sample of TAB online account holders, it is not surprising that data relating to online TAB gambling is more representative of that population when adjusted for the total adult population.

The subsequent NGS data (2013 and 2014) indicated that participation in online horse/dog race and sports gambling overall has probably remained stable over time although the trend appeared to be for a decline in New Zealand online gambling from 2013. However, with small sample sizes and overlapping confidence intervals, the results should be treated with caution. The HLS 2014 and Nielsen 2015 data indicated an increase in offshore online TAB/betting organisation gambling (2.3% and 1.8% respectively) which is contrary to the NGS data in 2014 (0.6%); again, the sample sizes are very small so these findings should be treated with caution.

As a comparison, online Lotto gambling through the New Zealand MyLotto website was 4.9% in 2012 (NGS) and 3.2% in 2010 (HLS). As with overall offshore online gambling, this is about half the percentage of 9.8% reported in the 2010 Nielsen survey (Table 20). Similarly, offshore online poker gambling was 0.4% in 2012 (NGS) and 0.5% in 2010 (HLS); these percentages were about a third of the 1.6% reported in the 2010 Nielsen survey (Table 20). These findings corroborate the overestimation hypothesis when non-online TAB gambling data are calculated for the total adult population in the Nielsen survey.

The NGS data also showed that the prevalence of New Zealand online Lotto gambling has been increasing over time (Table 20). This corresponds with information presented in the Lotto NZ annual reports which indicate that MyLotto sales were 4.7% of total sales in 2011/12, 6.2% in 2012/13 and 7.5% in 2013/14 (Lotto NZ, 2013, 2014), thus giving confidence in the NGS online TAB gambling findings.

Full intervention service statistics indicated that less than 1% of gamblers sought treatment for New Zealand online Lotto gambling in 2012, 2013 and 2014 (0.4%, 0.3% and 0.5%

respectively). A similar finding was noted for offshore online card gambling (0.8%, 0.6% and 0.7%).

Table 20: Percentage of total adult population taking part in online betting agency, Lotto and poker gambling by survey

Location of online provider	HLS 2010 (95% CI)	Nielsen 2010	NGS 2012 (95% CI)	NGS 2013 (95% CI)	NGS 2014 (95% CI)	HLS 2014 (95% CI)	Nielsen 2015
Offshore online betting agency gambling	-	0.7	0.7 (0.5, 1.0)	0.5 (0.2, 0.8)	0.6 (0.2, 0.9)	2.3 (1.2, 3.5)	1.8 (1.6, 2.0)
New Zealand online TAB gambling	4.2 (2.1, 6.3)	3.2	3.7 (3.1, 4.3)	2.9 (2.1, 3.6)	2.7 (2.0, 3.4)	-	-
New Zealand online Lotto gambling	3.2 (1.5, 4.8)	9.8	4.9 (4.2, 5.5)	6.0 (5.0, 7.0)	8.2 (7.0, 9.4)	-	-
Offshore online poker gambling	0.5 (0.1, 1.3)	1.6	0.4 (0.2, 0.7)	0.4 (0.1, 0.6)	0.1 (0.0, 0.1)	-	2.0

Note: These subsets of data were not available in the HLS 2012 survey report
95% CI not available for Nielsen 2010, or Nielsen 2015 online poker gambling

When online horse/dog race and sports betting were investigated separately, the substantially overlapping confidence intervals over time both for New Zealand and offshore online gambling indicate that there has probably been no change in prevalence over time (Table 21). The NGS prevalence was lower than the prevalence reported in the HLS 2014 and Nielsen 2015 data. For horse/dog race betting it was 0.4% in the NGS (95% CI 0.0 - 0.7), 1.7% (0.7 - 2.7) in the HLS and 1.0% (0.9 - 1.1) in the Nielsen reports. For sports betting, the rates were 0.2% NGS (0.1 - 0.4), 1.6% HLS (0.6 - 2.6) and 1.5% Nielsen (1.3 - 1.7).

Full intervention service data, however, indicated that whilst a very small percentage of people sought help for online/remote horse/dog race betting or sports betting, there appeared to be an increase in 2014 compared with the previous two years. The percentages for horse/dog race online/remote betting for 2012, 2013 and 2014 were: offshore (0.02%, 0.08% and 0.2%) and with the New Zealand TAB (0.7%, 0.8% and 1.3%). The corresponding percentages for sports betting online/remotely were: offshore (0.2%, 0.2% and 0.5%) and with the New Zealand TAB (0.6%, 0.6% and 1.3%).

Table 21: Percentage of total adult population taking part in online horse/dog race and sports gambling by survey

Location of online provider	NGS 2012 (95% CI)	NGS 2013 (95% CI)	NGS 2014 (95% CI)
Offshore online horse/dog race gambling	0.4 (0.2, 0.6)	0.3 (0.1, 0.6)	0.4 (0.0, 0.7)
New Zealand online horse/dog race gambling	2.9 (2.4, 3.4)	2.6 (1.9, 3.3)	2.0 (1.5, 2.6)
Offshore online sports gambling	0.4 (0.2, 0.6)	0.2 (0.0, 0.5)	0.2 (0.1, 0.4)
New Zealand online sports gambling	1.9 (1.4, 2.3)	0.8 (0.5, 1.1)	1.1 (0.6, 1.5)

The total population gambling online on horse/dog race or sports betting either offshore or with the New Zealand TAB is shown in Table 22 along with data for total New Zealand and offshore online gambling.

Table 22: Total adult population taking part in online horse/dog race and sports gambling

Location of online provider	NGS 2012 (95% CI)	NGS 2013 (95% CI)	NGS 2014 (95% CI)
Offshore online horse/dog race and sports gambling	26,170 (16,250 - 36,093)	18,865 (7,709 - 30, 024)	19,865 (6,748 - 32,985)
New Zealand online horse/dog race and sports gambling	131,881 (110,477 - 153,285)	102,714 (76,073 - 129,355)	96,334 (72,751 - 119,918)
Total offshore online gambling	59,416 (44,474 - 74,355)	43,538 (27,166 - 59,909)	32,557 (17,700 - 47, 410)
Total New Zealand online gambling	287,306 (257,300 - 317,316)	294,004 (253,235 - 334,773)	365,412 (318,313 - 412,514)

4.6.2 Expenditure on New Zealand and offshore online gambling

Overall expenditure

The results from the NGS indicated that overall in 2012, the total annual expenditure on online gambling in New Zealand was $133.7 million and on online gambling offshore was $47.6 million. In 2013, the values were $128.1 million and $14.6 million respectively, and in 2014 were $132.4 million and $36.2 million respectively. Confidence intervals overlapped between the years for New Zealand online gambling so there was unlikely to be a change across time. However, for offshore online gambling there was a decrease from 2012 to 2013 which increased again in 2014. Given that offshore online gambling participation has possibly declined over time, this indicates that some people who were taking part in offshore online gambling in 2014 were spending more on the activity; this was seen in the mean monthly expenditure for participants of $68, $28 and $92 for 2012, 2013 and 2014 respectively (Table 23). It is of note that median monthly expenditure was more stable over the three years at $17, $10 and $13. This indicates that the expenditure data were highly skewed with a small proportion having a high monthly expenditure.

The HLS reports do not detail annual expenditure for overall online gambling in New Zealand and offshore. The 2010 Nielsen study estimated a turnover of $2,061 million on offshore online gambling. This value is very substantially higher than the Wave 1 NGS expenditure estimate of $47.6 million. However, as detailed in the Discussion and Conclusions chapter, the Nielsen study calculated *turnover* (total amount gambled including re-invested winnings) rather than *expenditure* (total amount lost excluding any winnings) and the way the questions were asked will also have led to substantially over-inflated estimates.

Table 23: Annual expenditure by total adult population on online gambling by survey

Online gambling	Nielsen 2010[#]	NGS 2012[†]	NGS 2013[†]	NGS 2014[†]
New Zealand				
Amount $ million	-	133.7	128.1	132.4
(95% confidence interval)		(106.1, 161.2)	(101.8, 154.3)	(111.2, 153.5)
Monthly median $	-	*18.58*	*19.37*	*18.35*
Mean monthly $	-	*38.78*	*36.17*	*30.11*
Offshore				
Amount $ million	2,061	47.6	14.6	36.2
(95% confidence interval)		(32.0, 63.2)	(5.2, 24.0)	(25.3, 47.1)
Monthly median $	-	*16.65*	*9.48*	*12.92*
Mean monthly $	-	*67.70*	*27.94*	*92.49*

[#] Amounts represent turnover
[†] Amounts represent expenditure

Horse/dog race and sports online gambling expenditure

The results from the NGS indicated that the total annual expenditure on online gambling (horse/dog race betting and sports betting combined) in New Zealand in 2012 was $81.7 million and on online horse/dog race and sports gambling offshore was $19.4 million. This decreased in 2013 to $62.1 million and $5.9 million respectively; the decrease continued for New Zealand online gambling but appeared to broadly stabilise for offshore online gambling in 2014 ($45.9 million and $6.9 million respectively) (Table 24). However, due to overlapping confidence intervals for New Zealand online gambling across time, the apparent decrease may not be real. It is of note that although median values were stable over time for New Zealand online horse/dog race and sports gambling, they increased over time for offshore online gambling. However, mean values for offshore online horse/dog race and sports gambling decreased from 2012 to 2013 and then stabilised. This indicates that the data were skewed towards more people spending less on offshore online horse/dog race and sports gambling over time.

The 2010 and 2015 Nielsen surveys estimated turnover of $675 million and $1.1 billion respectively on offshore online horse/dog race and sports gambling. As with the overall gambling expenditure (and for the same reasons), this value is very substantially higher than the 2012 and 2014 NGS expenditure estimates. Additionally, the margin of error was extremely large for the Nielsen survey estimates which gives less confidence in their accuracy.

Table 24: Annual expenditure by total adult population on online horse/dog race and sports gambling by survey

Online horse/dog race and sports gambling	Nielsen 2010[#]	NGS 2012[†]	NGS 2013[†]	NGS 2014[†]	Nielsen 2015[#]
New Zealand					
Amount $ million	-	81.7	62.1	45.9	-
(95% confidence interval)		(55.4, 108.0)	(39.0, 85.2)	(29.4, 62.3)	
Monthly Median $	-	*16.95*	*17.38*	*16.73*	-
Mean monthly $	-	*51.65*	*50.35*	*39.58*	-
Offshore					
Amount $ million	675	19.4	5.9	6.9	1,100
(95% confidence interval)	(±266)[∞]	(10.5, 28.2)	(3.7, 8.0)	(2.0, 11.8)	(±574)[∞]
Monthly Median $	-	*9.86*	*11.85*	*14.70*	-
Mean monthly $	-	*61.65*	*25.94*	*28.92*	-

[#] Amounts represent turnover
[†] Amounts represent expenditure
[∞] Margin of error rather than confidence interval

Data are presented for horse/dog race betting and sports betting separately in Table 25.

Table 25: Annual expenditure by total population for online New Zealand horse/dog race and sports gambling separately

Online gambling activity	NGS 2012 (95% CI)	NGS 2013 (95% CI)	NGS 2014 (95% CI)
New Zealand horse/dog race gambling ($ million)	66.0	48.6	34.5
	(41.2, 90.8)	(30.1, 67.1)	(22.0, 47.1)
Offshore horse/dog race gambling ($ million)[#]	8.0	3.0	3.6
	(4.0, 12.0)	(2.0, 4.0)	(0.0. 8.6)
New Zealand sports betting ($ million)	15.8	13.5	11.3
	(10.9, 20.6)	(4.5, 22.5)	(4.8, 17.9)
Offshore sports betting ($ million)[#]	11.4	2.8	3.3
	(2.4, 20.3)	(0.0, 13.0)	(0.0, 11.7)

[#] Due to very small sample sizes and skewed data these values should be considered indicative only

As a comparison, the NGS overall horse/dog race and sports expenditure (land-based as well as online/remote) for each of the three years was compared with official Department of Internal Affairs (2015) actual expenditure data for the same years. The data showed that the NGS results were higher than the official figures in 2012 and 2013 but lower in 2014. However, the official figures were within the 95% confidence intervals for the NGS data in 2013 and 2014 (Table 26). This gives confidence that whilst the NGS data are not entirely accurate, they are within expected ranges given that the NGS participants were relying on self-recall when reporting expenditure. Self-recall invariably leads to recall bias. Further confidence in the NGS data is that the 1999 New Zealand national gambling prevalence survey also showed that self-reported expenditure on horse and dog race betting closely matched the official figures at that time (Abbott & Volberg, 2000).

Table 26: Annual expenditure for overall New Zealand horse/dog race and sports gambling

Horse/dog race and sports gambling	DIA 2012	DIA 2013	DIA 2014	NGS 2012	NGS 2013	NGS 2014
Amount $ million	283	294	311	402	371	286
(95% CI)	-	-	-	(338, 466)	(246, 496)	(210, 361)

5 DISCUSSION AND CONCLUSIONS

The main purpose of this study was to conduct supplementary analyses of the New Zealand National Gambling Study (NGS) data from 2012 (Wave 1), 2013 (Wave 2) and 2014 (Wave 3), specifically to investigate offshore gambling in relation to local gambling (land-based and online). The major, but not exclusive focus, is on sports and horse/dog race betting.

Strengths of this study are the good response rates over the three years of data collection (64% in 2012, 71% in 2013, 83% in 2014) and the ability to analyse data from the same participants over time from the large nationally representative baseline (Wave 1) sample. This has enabled some subgroup analyses to be conducted, particularly for New Zealand Lotto/keno gambling, and overall horse/dog race and sports gambling. However, data for offshore online/remote horse/dog race and sports betting, offshore commercial poker gambling and other offshore online gambling are limited by small sample size. For lotteries/raffles gambling, offshore online gambling is inextricable from offshore land-based gambling. These limitations have occurred because online gambling was not a primary focus of the original study design. Where the samples size are very small, the results should be considered with appropriate caution and should be deemed to be indicative rather than absolute.

Gambling participation

Despite popular opinion that internet gambling is a growing problem, the evidence from this nationally representative study indicates the opposite. Online/remote gambling both within New Zealand and on offshore sites is participated in by only a small percentage of the population and over the three years of the study the trend appeared to be a decline (with stability for some modes of gambling), with the exception of New Zealand Lotto online where participation increased. Similarly, the percentage of people seeking help from full intervention services for problems with online/remote gambling was very low in all three years (less than 3% both for offshore and NZ, and less than 5% overall) and was stable between 2012 and 2013 but increased very slightly in 2014. The marginal increase was mainly due to an increase in New Zealand-based and offshore online/remote gambling on horse/dog race and sports betting, and offshore casino EGM gambling.

Overall, prevalence of offshore online/remote gambling was 1.7%, 1.2% and 0.9% for 2012, 2013 and 2014 respectively. The most common mode of online gambling was Lotto on the New Zealand MyLotto website, which in Wave 1 comprised 5% of the adult population. In that year, 3.7% gambled with the New Zealand TAB online (horse/dog race betting and sports betting) and 0.7% gambled on offshore TABs or betting organisations/exchanges either online or by other remote interactive means.

The overall prevalence of gambling participation also decreased over the three years of the study. The prevalence was 80% in Wave 1, 78% in Wave 2 and 77% in Wave 3. Although the change was small and the confidence intervals overlapped in consecutive years, they did not overlap from Wave 1 to Wave 3 instilling confidence that the decrease was real. A decreasing participation was similarly noted for horse/dog race and sports gambling overall (in-venue, on-site and online) at 14%, 12% and 11% for each wave respectively. When examined in more detail, it was apparent that the same trend occurred for New Zealand online/remote horse/dog race and sports gambling combined (3.7%, 2.9%, 2.7%) but not for horse/dog race and sports offshore online/remote gambling combined (0.7%, 0.5%, 0.6%). The slightly decreasing trend generally continued when horse/dog race betting and sports betting were examined separately (horse/dog race betting 0.4%, 0.3% and 0.4%; sports betting 0.4%, 0.2% and 0.2%), although due to very small sample sizes, the results must be treated with extreme caution.

The only mode of gambling which appeared to be going against the reduced participation trend was online gambling on Lotto through the MyLotto website. Participation steadily increased from 5% in Wave 1 to 6% in Wave 2 to 8% in Wave 3. This corresponded with Lotto NZ annual reports which detailed that MyLotto sales were 4.7% of sales in 2011/12, 6.2% in 2012/13 and 7.5% in 2013/14.

Thus, the popular fear that internet gambling overall is substantially increasing in New Zealand due to increasing access via more accessible mobile means (e.g. through smartphones and tablets) is currently unfounded. This finding is somewhat surprising given that in some other jurisdictions the prevalence of online/remote interactive gambling has increased in recent years (e.g. in Australia, Canada and Sweden). The reasons for the lower and declining online gambling participation amongst New Zealand adults is currently unknown and could be due to a variety of reasons such as lower smartphone and tablet ownership, or slower broadband speeds than in other countries. It might also be due to participants not realising that some online sites they have been gambling on are based offshore rather than in New Zealand. In these instances, participants may not have responded to a question about offshore online gambling believing that they were gambling on a local site; this could have led to an under-reported prevalence. However, this would only have been a possibility where the research question specifically mentioned "overseas website". For other questions, for example for online poker gambling, the wording was such that neither "overseas" nor "New Zealand" were mentioned (i.e. the question referred to "playing poker for money or prizes online"); in such cases, the offshore gambling would have been captured as online poker gambling opportunities are not provided within New Zealand.

Alternatively, the lower participation in online gambling could be due to the undesirability of accessing gambling in this way. In Wave 1, 55% of the adult population indicated that they thought online gambling was a socially undesirable activity; this level of undesirability was only surpassed by non-casino EGMs at 57% (Abbott et al., 2015b). However, the steady increase in participation in Lotto online through the MyLotto website indicates that people are using this mode of gambling access when they wish to, or when they perceive it to be desirable to do so. Lotto participation is the most popular mode of gambling with 61% of the adult population gambling on this mode in the past 12 months in Wave 1 and only 4% indicating it to be a socially undesirable activity (Abbott et al., 2015b).

In Wave 1, no horse/dog race bettors gambled exclusively via offshore online/remote methods and only 2% of sports bettors did so. Only 5% of horse/dog race bettors and 7% of sports bettors gambled exclusively online/remotely via the New Zealand TAB. The majority of horse/dog race and sports bettors gambled online as an adjunct to betting at a New Zealand TAB venue or track event. This indicates that, despite the relative convenience of gambling by online or remote interactive methods, horse/dog race and sports gamblers generally were more likely to physically visit a venue to place their bets. It could be that more excitement is gained from gambling in a physical location with other people around than gambling alone online.

A similar finding was noted for Lotto gambling with only 2% of Lotto participants exclusively buying tickets online (NZ) and 6% buying online and from stores (NZ). Again, the physical excitement of having a paper ticket that potentially is a winner could be more than having virtual numbers online. However, for keno gamblers a different profile was noted with a much higher percentage (18.5%) gambling exclusively online (NZ). A higher proportion was also noted for poker gamblers with 6% gambling only offshore online and 19% doing so both online (offshore) and in venues (in NZ). These proportions were similar to casino gamblers where 18% gambled offshore only (land-based venues) and 14% gambled both in New Zealand (land-based venues) and offshore. Thus, for some modes of gambling it appears that the convenience of gambling online or offshore has a greater attraction than for other modes of gambling; these

appear to be modes of gambling where physical venue access is more restricted, particularly in regard to locations of casinos and commercial poker venues.

Sociodemographic characteristics of participation

The review of New Zealand and international literature identified that internet gambling was more popular with males than females (though in Sweden was gaining popularity amongst females) and amongst those in the younger adult age groups. There were little comparable data to identify trends by ethnicity although there appeared to be a higher participation by people of European ethnicity.

The current analyses generally appear to confirm those findings. A higher proportion of males participated in sports betting (via all modes of access not just online), horse/dog race betting (NZ online and physically at a TAB) and in commercial poker gambling (offshore online and land-based). However, the gender difference was less noticeable for lotteries/raffles participation (NZ land-based and offshore land-based and online), Lotto and keno participation (NZ land-based and online), casino gambling (NZ and offshore land-based) and other offshore online gambling[33].

The younger adult age groups were more likely to participate in sports betting (18-44 years, via all modes of access not just online), commercial poker gambling (18-34 years, offshore online and land-based) and other offshore online gambling (18-44 years). However, this was not the case for horse/dog race betting offshore online/remotely with a greater participation amongst the 45-64 year age groups; the reason for this is unclear but could be an artefact of very small sample sizes. Similarly the youngest age group (18-24 years) was least likely to participate in New Zealand online Lotto gambling, reflecting a lower participation in buying Lotto tickets from a store. It could be that Lotto participation is less exciting for younger adults compared with other modes of gambling.

For all modes of gambling analysed in this study, the greatest participation was by European/ Other participants with other ethnicities participating at much lower levels. There did not appear to be specific ethnic preferences for online vs. land-based modes of participation apart from New Zealand online keno gambling and offshore online/remote sports betting where there were slightly higher percentages of Asians participating (16% and 13% respectively) compared with other modes of gambling. However, due to very small sample sizes these findings should be considered with caution.

Participation and gambling behaviour

The literature review identified some evidence that online gamblers were more likely to gamble on a greater number of activities than land-based gamblers and also to have a higher frequency of participation. This was corroborated by the present research which indicated that online gamblers were more likely to gamble on multiple activities, although this finding was not exclusive to online gamblers; for the modes of gambling examined in this study, a similar finding was also noted for the land-based gamblers. It is also pertinent to note that for the other

[33] 'Other offshore online gambling' relates to online gambling on the following: casino games and EGMs (not cards), bingo, event betting, skill games, virtual sport and other non-specified gambling.

offshore online gamblers, none only gambled on this one activity although this finding should be treated with caution due to small sample sizes.

Generally, a greater proportion of the participants reported gambling infrequently, whether they gambled online or in land-based gambling. The exceptions to this finding were for commercial poker gambling (offshore online) where a greater proportion were regular continuous gamblers, and for online (NZ and offshore) horse/dog race betting where there was a more even spread amongst infrequent gamblers, regular non-continuous gamblers and regular continuous gamblers. Horse/dog race betting and sports betting are continuous modes of gambling and the results from this study also indicated that these gamblers were generally more likely to participate at least weekly rather than less often. Horse/dog race betting is also an easily accessible mode of gambling which could explain the larger spread amongst the online gamblers. In contrast, casino and poker gambling, whilst also continuous modes, are more specialised types of gambling in that participants have to make a distinct effort to visit a venue. It is acknowledged that online casino and poker gambling are readily available but the numbers participating in these modes was very small and could have masked findings in relation to the types of gambler participating in these activities.

Greater proportions of participants reported typical monthly expenditure on gambling in the higher range (usually $51 or higher) for all modes of gambling examined apart from raffles/ lotteries and Lotto which showed a more even spread of monthly expenditure. There were no major differences between land-based and online modes of gambling although online raffles/ lotteries (offshore) and Lotto (NZ) gamblers tended to have slightly higher monthly expenditure than land-based counterparts. The reason for a general lack of distinction between the terrestrial and online modes is unclear but could be related to the small samples sizes for online gambling for all modes apart from raffles/lotteries/Lotto gamblers.

A majority of the participants across the modes of gambling examined were non-problem gamblers or low-risk gamblers. However, there were notable exceptions for two modes of gambling. A greater proportion of offshore online commercial poker players were categorised as problem gamblers (13.8%) compared to New Zealand land-based poker players (3.7%) and similarly, 11.9% of other offshore online gamblers were problem gamblers.

Associated factors for offshore or online/remote gambling

There were some socio-demographic and gambling behaviour factors which were associated with online/remote gambling (in NZ and offshore) in the Wave 1 analyses when compared with equivalent land-based gambling. In some cases, the association was for greater odds (higher likelihood) of gambling online/remotely on the particular mode and in other cases the association was for lower odds (less likelihood). The associations were different for each mode of gambling; however, there were some commonalities across some modes of gambling.

Being a migrant, compared to being New Zealand born, was associated with greater odds for gambling on offshore raffles/lotteries (on-site and online), New Zealand Lotto online through MyLotto, and offshore online/remote horse/dog race and sports betting gambling combined vs. gambling on New Zealand land-based equivalents of those modes of gambling. The odds were about twice as great for Lotto and offshore online horse/dog race and sports gambling but 9 times greater for raffles/lotteries. It could be that migrants are more familiar with those modes of gambling in their home countries and so seek them out by online means. Interestingly, being a migrant was associated with lower odds for horse/dog race betting online/remotely (NZ and offshore combined).

Higher average monthly gambling expenditure, compared to the lowest range of $1-$10, was also associated with greater odds for New Zealand Lotto online gambling, horse/dog race betting online/remotely (NZ and offshore combined), and offshore online/remote horse/dog race and sports gambling combined. The odds were ≥ 4.5, ≥ 11.6 and 13.3 respectively for the three modes of gambling and generally increased with increasing expenditure. However, due to small sample sizes for horse/dog race and sports gambling, these odds ratios should be considered indicative only. As mentioned previously, online/remote gambling appears mainly to occur as an adjunct to more traditional land-based modes of gambling and, as such, it is perhaps not unexpected that online/remote gambling would be associated with higher monthly expenditure on gambling. What is more surprising is that this association was not noted for all the gambling modes examined; however, this could be due to small sample sizes masking true effects.

Other associations of note with greater odds for online/remote gambling included gambling on a greater number of activities for gambling on offshore raffles/lotteries (land-based and online) and gambling in offshore casinos (land-based). Generally, the odds were greater for gambling in this way compared with New Zealand land-based gambling with increasing odds the more activities participated in. This finding could be related to these modes of gambling generally being additional to other more preferred or more common local modes of gambling. Participants who lived in Wellington had four times greater odds for gambling at offshore casinos than at New Zealand casinos. Unlike Auckland and Christchurch, Wellington does not have a casino, so people from Wellington may be more likely to try offshore casino gambling when overseas, for example when on holiday.

Participants who were unemployed or had a lower quality of life (below median) had greater odds for gambling on commercial poker via offshore online sites than gambling within New Zealand at venues. Generally, taking part in poker tournaments requires an entry fee and unemployed people may be less able to afford this; however, online poker gambling does not always require a participation fee which could explain why unemployed participants, who have more free time, might participate in this mode of gambling.

It was notable that problem gambling severity was not associated with either higher or lower odds for participating online or remotely on any mode of gambling in comparison with participating in the equivalent land-based mode of gambling. Initially this might seem counterintuitive because, as previously mentioned, a greater proportion of online commercial poker players and other offshore online gamblers were problem gamblers compared to land-based gamblers. Additionally, in a previous NGS report, Abbott et al. (2014b) noted that other offshore online gambling was a significant predictor of problem gambling in multivariate analyses. The difference is that the present study is measuring associations between online/ remote or offshore gambling against land-based counterparts (not risk factors for problem gambling per se). In this study, we were also not able to examine associated factors for other offshore online gamblers as there was no equivalent land-based counterpart; other offshore online gambling was a category that captured all other modes of online gambling not previously reported and included multiple gambling modes. If we had been able to analyse this category, it is possible that problem gambling severity may have been identified as an associated factor.

As well as associations for greater odds of participation in online/remote or offshore gambling, there were some factors associated with a lower likelihood of participating in this way. Generally, the factors were different for the various gambling modes but a couple of factors of note included religion and smoking. Religious participants were less likely to participate in offshore online commercial poker gambling, and online/remote horse/dog race and sports betting (NZ and offshore). Participants who had ever smoked had lower odds for participating in offshore raffles/lotteries (land-based and online), and New Zealand Lotto online. Participants who had ever smoked more than 100 cigarettes in their lifetime were less likely to

participate in online/remote sports betting (NZ and offshore), and participants who smoked at least weekly had lower odds for participating in offshore casino gambling (land-based). Whilst the land-based gambling finding is perhaps not unexpected due to smoking bans enforced in public places in many parts of the world, online/remote gambling can take place anywhere one has access to an internet device, including the privacy of one's own home where smoking bans are unlikely to be in place. This finding is, therefore, counterintuitive, and requires further examination.

It is of note that ethnicity was not an associated factor for any mode of offshore or online/remote gambling when compared with the equivalent land-based mode of gambling, with the exception of New Zealand online Lotto participation for Pacific people who had lower odds (0.3 times) compared to in-store Lotto participation.

Expenditure

Total annual expenditure on online gambling in New Zealand was $133.7 million, $128.1 million and $132.4 million in 2012, 2013 and 2014 respectively. For offshore online gambling, the amounts were $47.6 million, $14.6 million and $36.2 million respectively. Thus, it can be seen that expenditure on offshore online gambling was substantially lower than expenditure on New Zealand-based online gambling. Whilst expenditure on New Zealand online gambling remained relatively stable over time, there was more fluctuation in offshore online gambling with a substantially lower expenditure reported in 2013 compared with 2012 and 2014. The reason for the decrease in 2013 is not immediately apparent but could be an artefact of small sample size. The prevalence of offshore online gambling in the corresponding years was 1.7%, 1.2% and 0.9% which appeared to indicate a declining trend, although this should be considered with caution due to overlapping confidence intervals and small sample sizes. However, when prevalence is considered alongside expenditure it appears that in 2014, some people who were taking part in offshore online gambling were spending proportionately more on the activity. This was borne out by examination of mean and median monthly expenditure per person. The mean values were $92 for offshore online gambling in 2014, compared with $68 in 2012 and $28 in 2013, whilst the median values were $17 (2012), $10 (2013) and $13 (2014). This shows that the expenditure data were highly skewed with a small proportion of participants having a disproportionately high monthly expenditure in 2014.

The corresponding total annual expenditure on horse/dog race and sports betting online with the New Zealand TAB in 2012, 2013 and 2014 was $81.7 million ($66.0 million on horse/dog betting; $15.8 million on sports betting), $62.1 million ($48.6 million; $13.5 million) and $45.9 million ($34.5 million; $11.3 million) respectively. For offshore online horse/dog race and sports betting, the amounts were $19.4 million ($8.0 million horse/dog; $11.4 million sports), $5.9 million ($3.0 million; $2.8 million) and $6.9 million ($3.6 million; $3.3 million) respectively. These figures reflect overall online gambling expenditure in that a substantially lower amount was spent on offshore online horse/dog race and sports betting compared with expenditure on New Zealand online horse/dog race and sports betting. However, when examining expenditure data by gambling type (horse/dog racing separately from sports betting), it was apparent that there was a different pattern for gambling online with the New Zealand TAB vs. gambling online with offshore sites. When gambling online with the New Zealand TAB, expenditure on sports betting was substantially lower than expenditure on horse/dog race betting. Conversely, when gambling with offshore online sites, expenditure on sports betting was higher than expenditure on horse/dog race betting in 2012, and similar to expenditure on horse/dog race betting in 2013 and 2014. However, the expenditure remained lower than that for New Zealand online sports gambling. The NGS questionnaire did not ask participants to explain why they chose to gamble on offshore online sites but one explanation for the higher

ratio of offshore online sports bettors compared with horse/dog race bettors could be that offshore sites may provide better odds for return on sports betting.

The aforementioned annual expenditure estimates have been derived from self-reported data which have inevitably included some level of recall bias and thus will not directly match actual expenditure figures. However, the NGS self-reported expenditure on horse/dog race and sports betting overall was comparable to official Department of Internal Affairs expenditure in the three years examined, giving confidence in the NGS data.

In Wave 1, the highest median monthly per person expenditure (excluding horse/dog race and sports gambling) was for overall (land-based NZ and offshore) casino gambling ($28). It could be that whilst this mode of gambling has a lower participation prevalence than some other modes of gambling (e.g. Lotto), the people who participate in casino gambling are more likely to do so more intensively.

As previously mentioned, gambling participation generally decreased from Wave 1 to Wave 2; however, this was only mirrored by a reduction in median monthly per person expenditure for other offshore online gambling. Expenditure increased in Wave 2 and Wave 3 for casino gambling, housie/bingo and poker gambling in a private residence. It also increased in Wave 2 for commercial poker gambling then subsequently reduced again in Wave 3; this finding is probably misleading and is likely due to very small samples with skewed results. Lotto expenditure remained relatively stable in all waves.

When horse/dog race and sports gambling expenditure was examined in Wave 1, it was apparent that median monthly per person expenditure was higher on horse/dog race betting compared to sports betting. For example, overall median horse/dog race and sports gambling combined was $25; the median was $22 for horse/dog race betting and $17 for sports betting. This also reflected the lower prevalence of sports betting in comparison with horse/dog race betting. Median expenditure on horse/dog race betting online/remotely when gambling with the New Zealand TAB was similar to that when gambling with offshore TABs/betting organisations ($16 vs. $17). A similar profile was noted for sports betting with a median monthly expenditure of $9 online/remotely via New Zealand TABs vs. $8 with offshore TABs/ betting organisations. Median expenditure on horse/dog race and sports gambling is harder to interpret in Wave 2 and Wave 3 due to the very small sample sizes but overall appeared to be relatively stable. However, there appeared to be a slight increase in median expenditure for offshore online/remote gambling on horse/dog race and sports betting combined over time.

Transitions into and out of online/remote gambling participation over time

For New Zealand online Lotto gamblers, generally past-year gamblers continued to gamble over the three years of the study, with only a minority stopping gambling at each wave. Similarly, for non-online Lotto gamblers in Wave 1 who took up online Lotto gambling in Wave 2, a majority continued gambling in Wave 3. This trend was similar to that seen for overall gambling participation.

However, for horse/dog race gambling or sports betting online/remotely (NZ and offshore combined) or offshore online/remote gambling overall, the profile was different with more fluctuation in terms of people moving into and out of gambling on those modes. A majority of those online gamblers who took up participation in Wave 2 or Wave 3 were horse/dog race and sports gamblers from land-based modes rather than people who participated in other modes of gambling. Although sample sizes were very small necessitating caution in interpreting these results, it could be that online horse/dog race and sports gambling fluctuates dependent on

major track or sporting events that occur intermittently (irregular event schedules such as Melbourne Cup and Rugby World Cup) rather than day-to-day races and events.

Online horse/dog race and sports gambling total population and expenditure estimates

In 2014 (Wave 3), almost 100,000 people (96,334) participated in online horse/dog race and sports gambling within New Zealand. Offshore online horse/dog race and sports gambling was a fifth of that number (19,865). In the same year, a total of 365,412 people participated in New Zealand online gambling and 32,557 people participated in offshore online gambling. Online horse/dog race and sports gamblers were, therefore, a quarter (26%) of the New Zealand online gambling population and almost two-thirds (61%) of the offshore online gambling population.

The corresponding total population expenditure estimates for 2014 were $45.9 million for New Zealand online horse/dog race and sports gambling and $6.9 million for offshore online horse/dog race and sports gambling. Total overall online gambling expenditure was $132.4 million for New Zealand gambling and $36.2 million for offshore gambling. Thus online horse/dog race and sports gamblers equated to about one-third (35%) of the New Zealand online gambling expenditure, and about one-fifth (19%) of the offshore online gambling expenditure.

These findings indicate that although 61% of New Zealand online gamblers gambled on offshore TAB/betting organisation sites (vs. 26% on NZ TAB online) in 2014, their expenditure was proportionally less when betting less on offshore sites (19% of total offshore online expenditure) than when gambling online in New Zealand (35% of total online expenditure). This fits with the previously mentioned theory that online horse/dog race and sports gambling participation could be fluctuating dependent on major track or sporting events. If people are more likely to only bet on offshore sites for major offshore events then the proportion of money spent is likely to be less overall than for online gambling occurring on more regular national events.

Reasons for differences between surveys

The NGS results presented in this report for offshore gambling participation and expenditure are substantially lower than results in the 'Online Gambling Survey' reports published by Nielsen for the New Zealand Racing Board (Nielsen, 2010, 2015[34]).

There are several reasons why results may be different between surveys which initially appear to be measuring the same thing. These can relate to survey methodology (e.g. the population sampled and processes for sampling, recruitment time frame), response rates, and how the questions are asked (different wording can lead to different responses and recall bias).

Survey methodology

The baseline NGS was a nationally representative survey of 6,251 adults (aged 18 years and older) recruited face-to-face over an eight month period. The survey was phrased as a gambling survey and the majority of questions related to gambling activities were presented in a past 12 month time frame. The HLS studies were also nationally representative with adult participants (15 years and older) recruited face-to-face. However, the surveys focused on lifestyles with embedded gambling questions (in a past 12 month time frame). The Nielsen surveys utilised a substantially different methodology. Adult participants aged 18 years and

[34] Preliminary data provided for this study.

older were recruited from two online panels; the first panel comprised TAB account holders and the second was an online panel. Both samples were deemed to be representative of their respective panels (i.e. TAB account holders and general online population); however, this representativeness was assessed by limited demographic and other online behaviour. The total sample size in 2010 was 1,206 respondents who were recruited over a 3.5 week period (Nielsen, 2010). The survey was phrased as an online gambling survey with participation questions in a past 12 month time frame.

The methodology for the Nielsen survey is likely to have led to substantially inflated data for online gambling for several reasons. First, participants were only recruited from online panels and in a very short time frame. The people who are members of online panels are likely to be those who are more confident with internet activities and are more likely to be frequent online users and thus, amongst gamblers, more frequent online gamblers. This means that those who gamble less frequently are less likely to be captured in this type of survey. This is more so with the TAB panel which specifically comprises gamblers and is unlikely to comprise non-gamblers (who would not have an online TAB account if they did not gamble). This creates a skewed sample in contrast to the NGS sample which included 20% non-gamblers; the TAB sample in the 2010 Nielsen report comprised two-thirds of the participants. Additionally, the very short recruitment period means that less frequent internet users were less likely to be captured; these people were also more likely to be those who were non- or infrequent online gamblers. This methodology also meant that participants self-selected into the survey; those who are interested in online gambling and those who are more active online are more likely to choose to participate than those people who infrequently gamble online or who are infrequent internet users. This is in contrast to the NGS where participants were proportionally recruited to be representative of the general population as a whole. The Nielsen sample is more likely to be representative of the online/remote gambling TAB population than it is of the general population.

Whilst the Nielsen data were weighted in order to make the results of the survey representative of the general population, various estimations were used and substantial uncertainty will remain as the proportion of the population who are not highly active online but who participate in overseas online gambling is not known. In contrast, the NGS is representative of the national population as a proportional sample was recruited nationally and weighting was conducted against the most recent Census population data. Another difference between the Nielsen survey and the Wave 1 NGS was Nielsen's use of incentives for participation; a koha[35] was not provided to participants in the Wave 1 NGS. Nielsen's "TAB sample were entered in a draw to win one of... three $500 account top-ups" and their online panel sample "received points for participation" (Nielsen, 2010, p. 6). While incentives are used to increase response rates (Fan and Yan, 2010), it may be argued that respondents who participate in surveys because of monetary incentives are likely to differ from voluntary participants.

The substantially smaller sample size in the 2010 Nielsen survey will also mean less certainty when interpreting data from subsamples where cell sizes for analyses are particularly low, leading to greater margins of error.

The way a survey is conducted can also influence the responses. Williams and Volberg (2010) reported that problem gambling prevalence rates were 1.5 to 2.2 times higher when the survey was phrased as a gambling survey rather than the gambling questions being embedded in a health or recreation survey because gamblers were more interested in participating in gambling surveys. It could reasonably be assumed that a similar effect would be noted for online gambling surveys attracting a higher proportion of online gambler participation. Williams and

[35] A koha is a small token of appreciation often provided to research participants as a gesture of appreciation for their time commitment. It is not an inducement to participate which ethically is not condoned as it could be viewed as a form of coercion.

Volberg also postulated that face-to-face surveys appear to result in more honest reporting. They state "These results indicate that prevalence rates are strongly determined by how the survey is conducted, and that prevalence rate differences between studies could just as easily be the result of procedural differences as due to true differences in population prevalence" (Williams & Volberg, 2010). Whilst the current report has a greater focus on participation and expenditure than problem gambling, it follows that gambling prevalence rates would be increased if problem gambling rates were higher.

Based on the preceding comments, it is likely that the higher participation rates for overall online gambling reported in the Nielsen reports compared to the NGS can be partially explained by the methodological differences in recruitment and sampled population. It also explains why the Nielsen prevalence data for online TAB/betting organisation gamblers were very similar to the NGS data for online TAB/betting organisation gamblers in 2010 though it does not account for the difference in 2015 (vs. 2014 NGS results).

HLS results were similar to those of the NGS in 2010 and 2012 but higher in 2014. In 2010 and 2012, the phrasing of offshore online gambling questions in the HLS were similar to the phrasing of the questions in the NGS. However, for the 2014 questionnaire, the HLS had revised wording which did not mention the word "overseas" in relation to online gambling apart from those modes where it is also possible to gamble online in New Zealand (i.e. on Lotto and TAB gambling). The rationale behind this change was that people would not necessarily realise they were gambling on offshore sites and if asked to state which offshore online gambling they had participated in, might underestimate because they thought they were gambling on a New Zealand site.

The 2014 HLS estimated that 4% of the population had participated in offshore online gambling compared with a 0.9% estimate in the 2014 NGS. One reason for this difference could be in relation to the HLS question on buying "an overseas lottery, lotto or keno ticket online [NOT through a NZ MyLotto account]" (Health Promotion Agency, 2015a). Unfortunately, the NGS did not specifically capture gambling online on overseas lotteries as the question was phrased as buying "a ticket in an overseas raffle or lottery (includes tickets bought in an overseas shop, by telephone, through the post, or online)" (National Research Bureau, 2012). The proportion of participants who bought an overseas raffle or lottery ticket in this way in 2014 was 3.1%. Some of these people would have bought their ticket online and this may have been the only online gambling activity they participated in. The 2014 HLS proportion was 0.3%. Therefore, the NGS offshore online gambling results are likely to be slightly underestimating the prevalence. However, this does not explain why a higher offshore online TAB/betting organisation gambling prevalence was noted in the 2014 HLS (2.3%) vs. the 2014 NGS (0.6%). It might be partially due to the HLS sample including people aged 15 to 17 years who were not included in the NGS samples; however, it is unlikely that many young people of that age would be accessing offshore online gambling sites as age restrictions exist. In New Zealand, the minimum age for gambling at the TAB is 18 years.

Response rates

Response rates are important because they can indicate response representativeness; a low response rate probably means that the sample is not representative of the population of interest whilst a higher rate indicates a greater likelihood for representativeness. The response rate for the Wave 1 (2012) NGS sample was 64%. For the HLS studies it was 56.7% (2010), 83.1% (2012) and 76.4% (2014) (Health Promotion Agency, 2015b). As a response rate for the Nielsen report participants was not documented for the 2010 survey, it is not possible to make a judgement on the representativeness of the sample. However, it is highly likely that the response rate was substantially lower than for the NGS and HLSs. For the 2015 Nielsen survey,

response rates of 16% for the TAB sample and 25% for the general online sample were reported. However, how these values were calculated is not known and the true response rate is likely to be lower[36].

Factors that can affect response rate of web-based (online) surveys include content and presentation of the questionnaire (Fan and Yan, 2010). Online surveys are also subject to a unique challenge referred to as "coverage error" as not all respondents will have ready accessibility to the internet, resulting in a biased sample (Fan and Yan, 2010, p. 134). While it may be argued that the focus of the Nielsen surveys was online gambling, it cannot be assumed that only individuals with easy internet access will engage in online gambling. As previously discussed, the very short recruitment time of only 3.5 weeks will also have impacted on participation and thus response rates. Nielsen's invitation to take part in the survey was sent by email (Nielsen, 2010). This was noted to be another factor that can reduce response rate because of increased use of spam filters and the lower coverage of the internet compared to telephone and postal-mail coverage (Fan and Yan, 2010). While some features of online surveys can be designed to enhance response rates (for instance, the use of incentives in Nielsen's survey), other factors could contribute to lower response rates.

Phrasing of expenditure questions

The validity of gambling expenditure estimates based on self-reported survey data has been discussed in the literature. Concerns have been raised when expenditure estimates based on self-reported data do not correspond with actual gambling expenditure (Wood & Williams, 2007b) which has led to several studies exploring the reasons behind this limitation, and possible solutions. Indeed, this issue has previously been discussed in the first report for the NGS (Abbott et al., 2014a) and in the 1999 New Zealand national gambling prevalence survey report (Abbott & Volberg, 2000). There are various reasons why self-reported expenditure data do not always match official figures. These can include the fact that visitors (tourists) also participate in gambling within New Zealand which can increase official figures. Additionally, for some modes of gambling, participants are less likely to factor in winnings than for others leading to misreporting of net expenditure, people may believe their net expenditure is lower than it actually is, or may deliberately under-report high expenditure to avoid stigma (Abbott & Volberg, 2000; Abbott et al., 2014a). Abbott and Volberg (2000) noted that self-reported lotteries expenditure was much higher than the official expenditure whilst the converse was noted for casino gambling and non-casino EGM gambling expenditure. This under- and over-estimation was noted in the present study with self-reported New Zealand lotteries products gambling expenditure of $817M, $756M and $929M respectively for 2012, 2013 and 2014 substantially higher than official figures of $419M, $432M and $463M. Conversely, the self-reported figures for casino and non-casino EGM gambling were substantially lower than official figures. They were $296M, $193M and $157M vs. $854M, $826M and $808M for non-casino EGMS and $308M, $206M and $222M vs. $509M, $520M and $509M for casino gambling.

The way the questions are worded can also substantially impact on the way participants respond. Expenditure questions in the NGS were worded as "When you [gamble on activity], about how much do you bet in a typical month?" (National Research Bureau, 2012). The

[36] For example, the Nielsen report indicates that 41,351 TAB customers were invited to participate and 6,006 completed the survey. The latter value as a percentage of the former is 14.5% not 16%. For the online survey, the number participating was reported (11,265) but the number eligible/invited to participate was not documented; therefore, the 25% response rate cannot be verified.

Nielsen questionnaire phrasing was "On the last occasion that you participated in each of the following activities, how much did you spend, including any winnings you reinvested?"[37]

In an early exploratory survey, Blaszczynski, Dumlao and Lange (1997) found that respondents' estimations of gambling expenditure varied depending on if they interpreted the question 'how much do you spend gambling?' as asking for net expenditure or turnover. When respondents think it is a question about turnover they are likely to provide "the total amount gambled inclusive of wins which are re-invested" (Blaszczynski et al., 1997. p. 249). Such responses inflate gambling expenditure estimates. When respondents think it is a question about net expenditure they describe the amount gambled minus re-invested winnings or in other words their 'out-of-pocket' expenditure (Blaszczynski et al., 1997). The authors suggested that it is important to provide respondents with clear instructions on how to calculate their expenditure estimates.

Another study by Blaszczynski, Ladouceur, Goulet and Savard (2006) exploring the effects of specific instructions on gambling expenditure calculations found that specific instructions resulted in a larger proportion of participants using the same calculation method. This suggested that specific instructions can reduce question misinterpretation. However, 30% in their study used variable calculation methods despite specific instructions which suggests that expenditure-related questions remain ambiguous.

Using a sample of 50 participants, Blaszczynski, Ladouceur, Goulet and Savard (2008) investigated the differences between gambling expenditure retrospectively reported on a monthly basis vs. recorded in a daily gambling expenditure chart. They found that gamblers tended to under-estimate expenditure when reporting on a monthly basis but over-estimated expenditure when reporting on a daily basis (Blaszczynski et al. 2008, p. 103). The authors argued that their findings added to the uncertainty of data validity in gambling expenditure estimates.

Based on the aforementioned findings of Blaszczynski et al. (2006, 2008), it appears that respondents in the Nielsen study have greatly over-estimated their gambling expenditure, as they were specifically asked to include re-invested winnings (i.e. turnover was measured). Conversely, the NGS question was less specific so participants may have responded to the questions either as net expenditure or turnover. Additionally, NGS participants were asked to report their expenditure in a "typical month" which could have led to under-estimations.

Wood and Williams (2007b) presented twelve variations of a retrospective question about past month gambling expenditure to a random sample of 2,424 adult gamblers in Ontario, Canada. They established the relative validity of each question format by comparing reported values with actual gambling revenue and amounts recorded in prospective diaries. They found very little correlation which suggested low reliability of the retrospective estimates. However, they found that question wording had substantial and variable effects on reported figures:

> Asking people how much they spent 'the last time they purchased/played that activity' and then asking 'how often they purchase/play' that activity produces much higher amounts than questions that ask for an aggregate estimate about monthly spending (Wood and Williams, 2007b, p. 74).

Although Wood and Williams concluded that retrospective estimates of gambling expenditure were generally unreliable, among the 12 question formats they tested, they found the following two had the most evidence of validity, the former having more validity than the latter:

[37] The present authors have not seen a copy of the 2010 questionnaire but were informed that it is the same as the questionnaire for the 2015 survey, which was provided to the authors for the purpose of this study.

> ‘Roughly how much money do you spend on [specific gambling activity] in a typical month?’ (with totals from each activity then added together).
>
> ‘Roughly how much money do you spend on [specific gambling activity] in a typical month? What we mean here is how much you are ahead or behind, or your net win or loss in a typical month’ (Wood and Williams, 2007b, p. 74).

However, they also noted that although the first question was often used in gambling surveys, it sometimes resulted in over-estimations. Suggesting the second question as an alternative, they reasoned that the additional explanation provided in the second question could minimise “misunderstandings on the part of the respondents, attuning them to the importance of calculating ‘net’ expenditures, as opposed to total outlay (initial outlay plus winnings)” (Wood and William, 2007b, p. 75).

Based on Wood and Williams’ research, it appears that although all self-reported expenditure estimates are unreliable to some degree, a more valid way of phrasing the question is that which was used in the NGS, namely asking respondents to think about the amount of money spent on each gambling activity in a typical month. Asking about expenditure on the last gambling occasion and then multiplying the amount by frequency of gambling led to higher amounts being reported (i.e. over-estimation); this was the format used in the Nielsen survey.

Recall bias is an additional factor which means that expenditure estimates remain different from actual expenditure even after vigilant phrasing of expenditure related questions. For example, Volberg, Gerstein, Christiansen and Baldridge (2001) reported:

> In some types of gambling (e.g. sports betting, poker games and wagering on horse races), there is probably a ‘macho’ mindset that leads participants to selectively recall wins and losses. It is also possible that people are better able to recall enjoyable events (such as winning) than unenjoyable events (such as losing). Alternatively, it is possible that people are more likely to remember a single, extremely large loss than a lengthy series of much smaller losses.

Furthermore, respondents’ capacity to accurately calculate expenditure may lead to inaccuracies in reported estimates. As reasoned by Wood and Williams (2007b, p. 65), even when question meaning is accurately interpreted, respondents’ capacity to calculate an average monthly expenditure figure is doubtful, as this is not an easy “calculation to make in the few seconds that most researcher-administered surveys provide”.

Thus although the expenditure estimates from both the NGS and the Nielsen reports are likely to be inaccurate to some extent, which is unavoidable due to recall bias, the Nielsen estimates are likely to be substantially overinflated due to the way the question was worded. This is doubly compounded by the wording requiring respondents not only to report *turnover* rather than net *expenditure* but also to report turnover only on the last occasion they gambled on that activity. We consider that the NGS expenditure estimates, especially for New Zealand Racing Board gambling are closer to the real expenditure on offshore gambling than the Nielsen estimates. When NGS New Zealand Racing Board expenditure was compared to official Department of Internal Affairs figures the NGS estimates were higher than official records in 2012 and 2013 and lower in 2014; however, official figures were within the 95% confidence intervals for the NGS 2013 and 2014 data. Additionally, as previously discussed, the self-reported expenditure figures from the NGS for other gambling modes are as expected in regard to being lower or higher than official figures; similar to that observed in New Zealand national prevalence results from 1999 (Abbott et al., 2000). This gives confidence in the NGS findings for New Zealand Racing Board gambling (horse/dog race and sports betting) being closer to actual expenditure by New Zealanders than Nielsen estimates.

Summary of key horse/dog race and sports betting findings

The evidence from this nationally representative National Gambling Study indicates that internet gambling is not currently a growing problem, despite popular opinion to the contrary. Online/remote gambling both within New Zealand and on offshore sites is participated in by a very small percentage of the population and, over the three years of the study, the trend appeared to be a decline, with the exception of gambling on Lotto online. The most common mode of online gambling was Lotto on the New Zealand MyLotto website (5% of the adult population in 2012). Horse/dog race betting and sports betting combined online/remote gambling in 2012 was lower (3.7% gambled with NZ TAB, 0.7% gambled offshore). Despite the convenience of gambling by online or remote interactive methods, horse/dog race and sports gamblers were more likely to physically visit a venue (race/track event or TAB) to place their bets.

Males were noted to be more likely to participate in sports betting (via all modes of access not just online), and horse/dog race betting (NZ online and physically at a TAB), with younger age groups more likely to participate in sports betting (via all access modes). The opposite was noted for offshore online/remote horse/dog race betting where the greatest proportion were aged 45 to 64 years. European/Other participants comprised the greatest percentage gambling on all modes of horse/dog race and sports gambling. No other major differences were noted between land-based and online/remote horse/dog race and sports gamblers.

There were some factors associated with higher online/remote (NZ and offshore combined) horse/dog race and sports gambling including being a migrant and having a higher total monthly gambling expenditure. There were also some factors associated with lower online/ remote (NZ and offshore combined) horse/dog race and sports gambling including being religious and smoking tobacco. Ethnicity was not associated with higher or lower online/ remote (NZ and offshore combined) horse/dog race and sports gambling.

Median per person monthly expenditure, and corresponding total annual expenditure, on horse/ dog race betting was higher than for sports betting. Median per person expenditure on offshore online/remote gambling on horse/dog race and sports betting combined slightly increased over time. This was not noted for New Zealand online/remote horse/dog race and sports betting combined.

There was some fluctuation in people transitioning into and out of horse/dog race and sports gambling over time and a majority of the online gamblers who took up online participation were already land-based horse/dog race and sports gamblers.

Conclusions

In conclusion, online gambling participation is still a very small proportion of gambling behaviour despite the increase in internet accessibility, and online gambling expenditure is substantially less than expenditure on land-based modes of gambling. Offshore online gambling occurred to a much lower extent than New Zealand based online gambling. Online gambling appeared to be an adjunct to gambling on the same modes by more traditional land-based means, with very few people gambling solely online. New Zealand seems to have a lower prevalence of internet gambling than some other Western countries which means that currently only a relatively small proportion of New Zealand funds (and potential tax revenue) is being 'lost' overseas. However, from a policy point of view, it will be important to monitor the situation and assess changes over time as ownership of mobile internet-capable devices increases and as ultra-fast broadband access becomes more widely available.

It is of note that there were higher proportions of problem gamblers amongst online commercial poker players and other offshore online gamblers[38]. Although the percentages of the adult population taking part in these forms of online gambling were very small, this finding has implications for public health and intervention provision, particularly in regard to people who might transition into online modes from gambling on land-based activities.

[38] Other offshore online gambling relates to online gambling on the following: casino games and EGMs (not cards), bingo, event betting, skill games, virtual sport and other non-specified gambling.

7 REFERENCES

Abbott, M., Bellringer, M., Garrett, N., Mundy-McPherson, S. (2014a). *New Zealand 2012 National Gambling Study: Overview and gambling participation. Report number 1*. Auckland: Auckland University of Technology, Gambling and Addictions Research Centre.

Abbott, M., Bellringer, M., Garrett, N., & Mundy-McPherson, S. (2014b). *New Zealand 2012 National Gambling Study: Gambling harm and problem gambling. Report number 2*. Auckland: Auckland University of Technology, Gambling and Addictions Research Centre.

Abbott, M., Bellringer, M., Garrett, N., & Mundy-McPherson, S. (2015a). *New Zealand 2012 National Gambling Study: 12-month follow-up (Wave 2). Report Number 4*. Auckland: Gambling and Addictions Research Centre, Auckland University of Technology.

Abbott, M., Bellringer, M., Garrett, N., & Mundy-McPherson, S. (2015). *New Zealand 2012 National Gambling Study: Attitudes towards gambling. Report Number 3*. Auckland: Gambling and Addictions Research Centre, Auckland University of Technology.

Abbott, M., Stone, C.A., Billi, R., & Yeung, K. (2015). Gambling and problem gambling in Victoria, Australia: Changes over 5 years. *Journal of Gambling Studies*. Advance online publication. DOI10.1007/s10899-015-9542-1.

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. Report number 3 of the New Zealand Gaming Survey*. Wellington: Department of Internal Affairs.

Baker, A. (2011). Gambling goes mobile. Report released. *Casino Advisor*. August 6th 2011. Retrieved from: http://www.casinoadvisor.com/gambling-goes-mobile-report-released-news-item.html

Blaszczynski, A., Dumlao, V., & Lange M. (1997). "How much do you spend gambling?" Ambiguities in survey questionnaire items. *Journal of Gambling Studies, 13*(3), 237-252.

Blaszczynski, A., Ladouceur, R., Goulet, A., & Savard, C. (2006). 'How much do you spend gambling?': Ambiguities in questionnaire items assessing expenditure. *International Gambling Studies, 6*(2), 123-128,

Blaszczynski, A., Ladouceur, R., Goulet, A., & Savard, C. (2008). Differences in monthly versus daily evaluations of money spent on gambling and calculation strategies. *Journal of Gambling Issues, 21*, 98-105.

Colmar Brunton. (2010). *End of year reporting of online gambling figures*. For The New Zealand Lotteries Commission.

Commonwealth of Australia. (2009). *Review of current and future trends in interactive gambling activity and regulation: Literature review*. Report to the Australian Government Department of Families, Housing, Community Services and Indigenous Affairs.

Department of Internal Affairs. (2008). *People's participation in, and attitudes to, gambling, 1985-2005. Results of the 2005 survey*. Wellington: Department of Internal Affairs.

Department of Internal Affairs. (2015). *Gambling expenditure statistics*. Retrieved from: http://www.dia.govt.nz/diawebsite.nsf/wpg_URL/Resource-material-Information-We-Provide-Gambling-Expenditure-Statistics

Devlin, M. (2011). *A bet on the 'net - Internet gambling in New Zealand. Preliminary findings*. Wellington: Health Sponsorship Council.

European Commission. (2006). *Study of gambling services in the internal market of the European Union*. Lausanne, Switzerland: European Commission.

Fan, W., & Yan, Z. (2010). Factors affecting response rates of the web survey: A systematic review. *Computers in Human Behaviour, 26*(2), 132-139.

Gainsbury, S. (2012). *Internet gambling: Current research findings and implications*. New York: Springer.

Gainsbury, S.M. (2015). Online gambling addiction: The relationship between internet gambling and disordered gambling. *Current Addiction Reports, 2*(2)185-193.

Gainsbury, S.M., Russell, A., Hing, N., Wood, R., Lubman, D., & Blaszczynski, A. (2015a). How the internet is changing gambling: Findings from an Australian prevalence survey. *Journal of Gambling Studies, 31*(1) 1-15.

Gainsbury, S.M., Russell, A., Wood, R., Blaszczynski, A., & Hing, N. (2015b). The interaction between gambling activities and modes of access: A comparison of internet-only, land-based only, and mixed-mode gamblers. *Addictive Behaviours, 41,* 34-40.

Gainsbury, S.M., Russell, A., Wood, R., Hing, N., & Blaszczynski, A. (2015c). How risky is internet gambling? A comparison of subgroups of internet gamblers based on problem gambling status. *New Media & Society, 17*(6) 861-879.

Gainsbury, S.M., Suhonen, N., & Saastamoinen, J. (2014). Chasing losses in online poker and casino games: Characteristics and game play of internet gamblers at risk of disordered gambling. *Psychiatry Research, 217,* 220-225.

Gambling Commission. (2011). *Industry statistics: April 2008 to March 2011*. Birmingham, United Kingdom: Gambling Commission.

Gambling Commission. (2015a). *About remote gambling (including online gambling).* Retrieved from http://www.gamblingcommission.gov.uk/Gambling-sectors/Online/About-the-remote-gambling-industry/About-remote-gambling.aspx

Gambling Commission. (2015b) *Gambling participation data survey data. Survey data on gambling participation – July 2015*. Retrieved from: http://www.gamblingcommission.gov.uk/Gambling-data-analysis/Gambling-participation/Gambling-participation-data/Gambling-participation-survey-data.aspx

Global Betting and Gaming Consultancy. (2013). *Interactive gambling report*. Isle of Man; Global Betting and Gaming Consultancy.

Gray, R. (2011). *New Zealanders' participation in gambling: Results from the 2010 Health and Lifestyles Survey*. Wellington: Health Sponsorship Council.

Griffiths, M.D., Wardle, H., Orford, J., Sproston, K., & Erens, B. (2009). Sociodemographic correlates of internet gambling: Findings from the 2007 British Gambling Prevalence Survey. *CyberPsychology and Behavior, 12*(2), 199-202.

Health Promotion Agency. (2015a). *2014 Health and Lifestyles Survey*. Wellington: Health Promotion Agency Research and Evaluation Unit. Retrieved from: http://www.hpa.org.nz/sites/default/files/2014-HLS-questionnaire-web.pdf

Health Promotion Agency. (2015b). *2014 Health and Lifestyles Survey: Methodology report*. Wellington: Health Promotion Agency Research and Evaluation Unit. Retrieved from: http://www.hpa.org.nz/sites/default/files/2014%20HLS%20Methodology.pdf

Health Sponsorship Council. (2007). *2006/07 Gaming and Betting Activities Survey: New Zealanders' knowledge, views and experiences of gambling and gambling-related harm*. Auckland: National Research Bureau Ltd. Retrieved from http://www.hpa.org.nz/sites/default/files/GBAS%202006-07%20Final_Exec_Sum.pdf

Health Sponsorship Council. (2010). *New Zealanders' knowledge, views and experience of gambling and gambling harm: Results from the 2010 Health and Lifestyles Survey*. Wellington: Health Sponsorship Council. Retrieved from http://www.hsc.org.nz/researchpublications.html

Hing, N., Gainsbury, S., Blaszczynski, A., Wood, R., Lubman, D., & Russell, A. (2014). *Interactive gambling*. Victoria, Australia: Gambling Research Australia. Retrieved from: http://www.responsiblegambling.vic.gov.au/information-and-resources/research/recent-research/interactive-gambling

Lotto NZ. (2013). *Annual report 2012/13*. Auckland: Lotto NZ. Retrieved from: https://mylotto.co.nz/assets/footer-pages/about-us/reports-and-statement-of-intent/Annual-Reports/Lotto-NZ-AnnualReport.pdf

Lotto NZ. (2014). *Annual report 2013/14*. Auckland: Lotto NZ. Retrieved from: https://mylotto.co.nz/assets/footer-pages/about-us/reports-and-statement-of-intent/Annual-Reports/LOT0550-Annual-Report-2014-WEB.pdf

MacKay, T-L., & Hodgins, D. (2012). Cognitive distortions as a problem gambling risk factor in internet gambling. *International Gambling Studies, 12*(2), 163-175.

McBride, J., & Derevensky, J. (2009). Internet gambling behaviour in a sample of online gamblers. *International Journal of Mental Health and Addiction, 7*, 149-167.

Ministry of Community Development, Youth and Sports. (2005). *Report of survey on participation in gambling activities among Singapore residents, 2005*. Singapore: Ministry of Community Development, Youth and Sports.
Retrieved from: http://www.ncpg.org.sg/en/Pages/Publication.aspx

Ministry of Community Development, Youth and Sports. (2008). *Report of survey on participation in gambling activities among Singapore residents, 2008*. Singapore: Ministry of Community Development, Youth and Sports.
Retrieved from: http://www.ncpg.org.sg/en/Pages/Publication.aspx

Ministry of Health (2006). *Problem gambling in New Zealand: Analysis of the 2002/03 New Zealand Health Survey*. Wellington: Ministry of Health.

Ministry of Health. (2009). *A focus on problem gambling: Results of the 2006/07 New Zealand Health Survey*. Wellington: Ministry of Health.

Ministry of Health. (2012). *Problem gambling in New Zealand: Preliminary findings from the New Zealand Health Survey (July 2011 to March 2012)*. Wellington: Ministry of Health.

Monaghan, S. (2008). *Internet and wireless gambling - A current profile*. Melbourne: Australasian Gaming Council.

National Council on Problem Gambling. (2012). *Report of survey on participation in gambling activities among Singapore residents, 2011*. Singapore: National Council on Problem Gambling. Retrieved from: http://www.ncpg.org.sg/en/Pages/Publication.aspx

National Council on Problem Gambling. (2015). *Report of survey on participation in gambling activities among Singapore residents, 2014*. Singapore: National Council on Problem Gambling. Retrieved from: http://www.ncpg.org.sg/en/Pages/Publication.aspx

National Research Bureau. (2012). *The National Survey Of Lotteries, Gaming & Betting Activities survey questionnaire NRB Version 9*. Auckland: National Research Bureau. Retrieved from: http://www.aut.ac.nz/__data/assets/pdf_file/0004/549805/2012-NGS-Questionnaire-28-2-12-Final.pdf

New Zealand Government. (2013). *Gambling Act 2003* (Public Act 2003 No 51). Wellington: The New Zealand Government.

New Zealand Government. (2015). *Gambling Amendment Act 2015*. Wellington: The New Zealand Government.

New Zealand Lotteries. (2012). NZ Lotteries Statement of Intent for the financial years ending 30 June 2013-2015. Retrieved from: https://mylotto.co.nz/assets/footer-pages/downloads/Statement-Of-Intent/Statement-of-Intent-2012-FINAL.pdf

New Zealand Racing Board. (2014). *New Zealand Racing Board overview and racing industry challenges*. Briefing note to Racing Minister.
Retrieved from: http://www.nzracingboard.co.nz/other/

Nielsen. (2010). *Online gambling survey. Report prepared for New Zealand Racing Board*. Wellington: Nielsen.

Owens, M. (2010) There's an app for that (or soon will be): Smart phones, social networking, and internet gaming. *Gaming Law Review and Economics, 14*(3), 171-174.

Parliament of New South Wales. (2014). *The impact of gambling*.. Sydney: New South Wales Legislative Council, Select Committee on Gambling.
Retrieved from: http://www.parliament.nsw.gov.au/gamblinginquiry

Philander, K.S., & MacKay, T. (2014). Online gambling participation and problem gambling severity: Is there a causal relationship*? International Gambling Studies, 4*(2), 214-227.

Ranade, S., Bailey, S., & Harvey, A. (2006). *A literature review and survey of statistical sources on remote gambling*. London: RSeconsulting.

Research and Markets (n.d.) *Global Online Gambling*. Research and Markets Brochure. Retrieved from: http://www.researchandmarkets.com/reports/1954722/global_online_gambling.pdf

Rrychlak, R.J. (2011). The legal answer to cyber-gambling. *Mississippi Law Journal*, *80*(4), 1229-1246.

Stocks, T. (2015). *"Red Roses and Slain Dragons" A presentation by Tim Stocks, Chairman James Stocks & Co and Partner Taylor Wessing LLP*. Retrieved from: https://www.kpmg.com/GI/en/IssuesAndInsights/ArticlesPublications/Events/eSummit-2015/Documents/Tim-Stocks.pdf

Svensson, J., & Romild, U. (2011). Incidence of internet gambling in Sweden: Results from the Swedish longitudinal gambling study. *International Gambling Studies, 11*(3), 357-375.

Tryggvesson, K. (2007). *Internet poker in Sweden: The extent, development and structure in 2006*. English summary of Nätpokerspelandet i Sverige: Omfattning, utveckling och karaktär 2006 Soradrapport 43. Stockholm: Stockholm University.

Tu, D. (2013). *New Zealanders participation in gambling: Results from the 2012 Health and Lifestyles Survey*. Wellington: Health Promotion Agency.

Volberg, R.A., Gerstein, D.R., Christiansen, E.M., & Baldridge, J. (2001). Assessing self-reported expenditures on gambling. *Managerial and Decision Economics, 22*(1-3), 77-96.

Wardle, H., Moody, A., Griffiths, M., Orford, J., & Volberg, R. (2011a). Defining the online gambler and patterns of behaviour integration: Evidence from the British Gambling Prevalence Survey 2010. *International Gambling Studies, 11*(3), 339-356.

Wardle, H., Moody, A., Spence, S., Orford, J., Volberg, R., Jotangia, D., Griffiths, M., Hussey, D., & Dobbie, F. (2011b). *British Gambling Prevalence Survey 2010*. United Kingdom: National Centre for Social Research.

Wardle, H., Seabury, C., Ahmed, H., Payne, C., Byron, C., Corbett, J., & Sutton, R. (2014). Gambling behaviour in England and Scotland: Findings from the health survey for England 2012 and Scottish Health Survey 2012. United Kingdom: The Gambling Commission. Retrieved from: http://www.gamblingcommission.gov.uk/Gambling-data-analysis/Gambling-participation/BGPS/BGPS.aspx

Williams, R.J., Hann, R.G., Schopflocher, D., West, B., McLaughlin, P., White, N., King, K., & Flexhaug, T. (2015). Quinte longitudinal study of gambling and problem gambling. Guelph, Ontario: Ontario Problem Gambling Research Centre. Retrieved from http://hdl.handle.net/10133/3641

Williams, R.J., & Volberg, R.A. (2010). *Best Practices in the Population Assessment of Problem Gambling*. Report prepared for the Ontario Problem Gambling Research Centre. Guelph, Ontario, Canada.

Wood, R., & Williams, R. (2007a). Problem gambling on the internet: Implications for internet gambling policy in North America. *New Media & Society, 9*(3), 520-542.

Wood, R.T., & Williams, R.J. (2007b). '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*(1), 63-77.

Wood, R., & Williams, R. (2011). A comparative profile of the internet gambler: Demographic characteristics, game play patterns, and problem gambling status. *New Media & Society, 13*(7), 1123-1141.

Wood, R.T., & Williams, R.J. (2007). Internet gambling: Past, present and future. In G. Smith, D. Hodgins, & R.J. Williams (Eds.), *Research and measurement issues in gambling studies* (pp. 491-514). San Diego, California: Elsevier Publishing.

Wood, R.T., & Williams, R.J. (2009). *Internet gambling: Prevalence, patterns, problems, and policy options*. Guelph, Ontario: Ontario Problem Gambling Research Centre. Retrieved from: http://www.abc.net.au/mediawatch/transcripts/0909_originalreport.pdf

Wood, R.T., & Williams, R.J. (2011). A comparative profile of the internet gambler: Demographic characteristics, game-play patterns, and problem gambling status. *New Media & Society, 13*(7), 1123-1141.

Woodruff, C., & Gregory, S. (2005). Profile of internet gamblers: Betting on the future. *UNLV Gaming Research & Review Journal, 9*(1), 1-14.

Woolley, R. (2003). Mapping internet gambling: Emerging modes of online participation in wagering and sports betting. *International Gambling Studies, 3*(1), 3-21.

APPENDIX 1:
Prevalence of gambling in New Zealand and offshore excluding horse/dog race and sports gambling

Wave 1

		Wave 1 (2012, baseline) N=6,251									
		New Zealand				Offshore					
		On-site		Online/Remote		On-site		Online/Remote		*Total*	
Gambling activity		**%**	**(95% CI)**	**%**	**(95% CI)**	**%**	**(95% CI)**	**%**	**(95% CI)**	***%***	***(95% CI)***
Cards	Poker: private residence	3.00	(2.42, 3.54)		N/A		N/A		N/A	*3.00*	*(2.42, 3.54)*
	Poker: commercial	1.71	(1.27, 2.14)		N/A		N/A	0.44	(0.23, 0.66)	*1.81*	*(0.37, 2.26)*
	Other cards not poker		#		N/A		#		#	*0.99*	*(0.71, 1.27)*
	Any cards		*#*		*N/A*		*#*		*#*	*4.24*	*(3.60, 4.88)*
Lotteries, raffles, keno	Raffle/lottery	46.85	(45.40, 48.31)		N/A		3.21 (2.72, 3.70)			*47.89*	*(46.43, 49.35)*
	Lotto	60.86	(59.41, 62.31)	4.88	(4.23, 5.53)		N/A		N/A	*62.28*	*(60.84, 63.72)*
	Keno	2.32	(1.92, 2.71)	0.68	(0.44, 0.92)		N/A		N/A	*2.84*	*(2.39, 3.29)*
	Any raffles/lotteries	*71.86*	*(70.51, 73.21)*	*4.95*	*(4.30, 5.60)*		*3.21 (2.72, 3.70)*			*72.54*	*(71.20, 73.88)*
Casino/EGM	Casino (Table/EGM)	9.43	(8.52, 10.35)		N/A	3.65	(3.06, 4.24)		N/A	*11.48*	*(10.48, 12.47)*
	EGMs (Pub/Club)	13.72	(12.66, 14.77)		N/A		N/A		N/A	*13.72*	*(12.66, 14.77)*
	Any casino or EGMs	*18.47*	*(17.28, 19.66)*		*N/A*	*3.65*	*(3.06, 4.24)*		*N/A*	*19.70*	*(18.48, 20.92)*
Other	Housie/bingo		#		N/A		#		#	*1.67*	*(1.34, 2.00)*
	Other offshore online gambling[†]		N/A		N/A		N/A	0.62	(0.37, 0.88)	*0.62*	*(0.37, 0.88)*

Unknown as not specifically asked in survey

[†] Includes: Internet casino games and EGMs - not cards (0.20%, 0.08-0.33), internet bingo (0.07%, 0.00-0.14), event betting (0.12%, 0.01-0.23), skill games (0.13%, 0.04-0.22), virtual sport (0.12%, 0.00-0.26), raffle/lottery (0.01%, 0.00-0.03) and non-specified gambling (0.04%, 0.00-0.10)

Data weighted for 2013 Census data and sampling weights

N/A = Not applicable

Wave 2

		Wave 2 (2013) N=3,745									
		New Zealand				Offshore					
		On-site		Online/Remote		On-site		Online/Remote		*Total*	
Gambling activity		**%**	**(95% CI)**	**%**	**(95% CI)**	**%**	**(95% CI)**	**%**	**(95% CI)**	***%***	***(95% CI)***
Cards	Poker: private residence	2.30	(1.60, 3.00)	N/A		N/A		N/A		*2.30*	*(1.60, 3.00)*
	Poker: commercial	1.18	(0.66, 1.70)	N/A		N/A		0.37	(0.10, 0.65)	*1.29*	*(0.74, 1.84)*
	Other cards not poker		#	N/A			#		#	*0.93*	*(0.58, 1.28)*
	Any cards		*#*	*N/A*			*#*		*#*	*3.34*	*(2.56, 4.12)*
Lotteries, raffles, keno	Raffle/lottery	47.63	(45.74, 49.53)	N/A		3.21 (2.61, 3.81)				*48.66*	*(46.76, 50.55)*
	Lotto	58.06	(56.15, 59.96)	6.00	(4.99, 7.01)	N/A		N/A		*59.73*	*(57.83, 61.63)*
	Keno	2.01	(1.54, 2.48)	0.59	(0.31, 0.87)	N/A		N/A		*2.54*	*(2.00, 3.08)*
	Any raffles/lotteries	*70.77*	*(68.98, 72.55)*	*6.07*	*(5.05, 7.08)*	*3.21 (2.61, 3.81)*				*71.70*	*(69.94, 73.48)*
Casino/EGM	Casino (Table/EGM)	7.21	(6.14, 8.28)	N/A		2.52	(1.90, 3.13)	N/A		*8.81*	*(7.66, 9.97)*
	EGMs (Pub/Club)	10.88	(9.62, 12.14)	N/A		N/A		N/A		*10.88*	*(9.62, 12.14)*
	Any casino or EGMs	*15.21*	*(13.74, 16.68)*	*N/A*		*2.52*	*(1.90, 3.13)*	*N/A*		*16.21*	*(14.71, 17.72)*
Other	Housie/bingo		#	N/A			#		#	*1.31*	*(0.96, 1.65)*
	Other offshore online gambling[†]		N/A	N/A			N/A	0.42	(0.19, 0.65)	*0.42*	*(0.19, 0.65)*

Unknown as not specifically asked in survey

[†] Includes: Internet casino games and EGMs - not cards (0.15%, 0.03-0.28), internet bingo (0.06%, 0.00-0.15), event betting (0.04%, 0.00-0.11), skill games (0.15%, 0.00-0.30) and virtual sport (0.09%, 0.00-0.19)

Data weighted for 2013 Census data, sampling weights and attrition by age, gender, ethnicity and PGSI category at Wave 1

N/A = Not applicable

Wave 3

		Wave 3 (2014) N=3,115									
		New Zealand				Offshore					
		On-site		Online/Remote		On-site		Online/Remote		*Total*	
Gambling activity		**%**	**(95% CI)**	**%**	**(95% CI)**	**%**	**(95% CI)**	**%**	**(95% CI)**	***%***	***(95% CI)***
Cards	Poker: private residence	1.94	(1.15, 2.73)		N/A		N/A		N/A	*1.94*	*(1.15, 2.73)*
	Poker: commercial	0.63	(0.25, 1.01)		N/A		N/A	0.07	(0.00, 0.15)	*1.94*	*(1.15, 2.73)*
	Other cards not poker		#		N/A		#		#	*1.24*	*(0.67, 1.81)*
	Any cards		*#*		*N/A*		*#*		*#*	*3.21*	*(2.25, 4.17)*
Lotteries, raffles, keno	Raffle/lottery	45.74	(43.62, 47.87)		N/A		3.06 (2.40, 3.72)			*46.87*	*(44.73, 49.01)*
	Lotto	57.40	(55.23, 59.57)	8.21	(7.00, 9.43)		N/A		N/A	*59.58*	*(57.42, 61.74)*
	Keno	1.94	(1.42, 2.47)	0.60	(0.33, 0.86)		N/A		N/A	*2.41*	*(1.83, 2.98)*
	Any raffles/lotteries	*69.49*	*(67.40, 71.58)*	*8.28*	*(7.06, 9.50)*		*3.06 (2.40, 3.72)*			*70.92*	*(68.85, 72.99)*
Casino/EGM	Casino (Table/EGM)	7.28	(6.11, 8.46)		N/A	2.67	(1.95, 3.40)		N/A	*8.65*	*(7.40, 9.89)*
	EGMs (Pub/Club)	10.44	(9.14, 11.73)		N/A		N/A		N/A	*10.44*	*(9.14, 11.73)*
	Any casino or EGMs	*14.41*	*(12.87, 15.95)*		*N/A*	*2.67*	*(1.95, 3.40)*		*N/A*	*15.22*	*(13.65, 16.79)*
Other	Housie/bingo		#		N/A		#		#	*1.19*	*(0.82, 1.57)*
	Other offshore online gambling[†]		N/A		N/A		N/A	0.31	(0.13, 0.50)	*0.31*	*(0.13, 0.50)*

Unknown as not specifically asked in survey

[†] Includes: Internet casino games and EGMs - not cards (0.12%, 0.01-0.23), internet bingo (0.07%, 0.00-0.14), event betting (0.09%, 0.00-0.20), skill games (0.09%, 0.00-0.18) and non-specified gambling (0.02%, 0.00-0.05)

Data weighted for 2013 Census data, sampling weights and attrition by age, gender, ethnicity and PGSI category from Wave 1 to Wave 2

N/A = Not applicable

APPENDIX 2:
Prevalence of gambling in New Zealand and offshore excluding horse/dog race and sports gambling by socio-demographic variables and gambling behaviour

Commercial poker

		In-venue		Offshore online	
Socio-demographic variable		**n**	**%**	**n**	**%**
Gender	Male	87	82.0	24	86.1
	Female	19	18.0	4	13.9
Age group (years)	18-24	34	32.3	7	25.3
	25-34	40	37.7	13	47.1
	35-44	11	10.7	3	9.3
	45-54	15	14.3	5	17.2
	55-64	3	3.3	0	1.1
	65+	2	1.6	-	
Ethnicity	Māori	25	23.2	7	26.9
	Pacific	4	4.0	2	6.9
	Asian	8	7.2	1	2.5
	European/Other	70	65.6	18	63.7
NZ Individual Deprivation Index	0	53	49.8	8	28.0
	1	25	23.7	10	36.3
	2	12	11.0	4	14.5
	3	8	7.5	1	3.5
	4	6	5.2	4	14.1
	5	2	1.4	1	1.9
	6+	1	1.4	0	1.7
Gambling behaviour					
Number of gambling activities	1	2	1.5	-	
	2	13	11.8	2	6.0
	3	12	11.1	4	14.4
	4-6	40	37.1	10	35.5
	7-9	26	24.4	9	31.6
	10+	15	14.1	3	12.6
Gambling status	Infrequent	62	57.8	11	39.8
	Regular non-continuous	13	11.9	2	7.3
	Regular continuous	32	30.2	15	52.9
Gambling frequency	At least weekly	45	42.2	18	65.1
	At least monthly	41	38.5	9	33.2
	Less frequently than monthly	21	19.4	0	1.8
Total monthly gambling expenditure ($)	$1-$10	2	2.3	1	2.5
	$11-$20	2	1.9	-	
	$21-$30	2	1.8	0	1.8
	$31-$50	9	8.4	0	0.9
	$51-$100	10	9.4	1	4.3
	$101-$500	59	55.8	18	65.1
	>$500	22	20.3	7	25.4
PGSI	Non-problem gambler	65	60.9	10	35.4
	Low-risk gambler	24	22.6	11	39.8
	Moderate-risk gambler	14	12.8	3	11.0
	Problem gambler	4	3.7	4	13.8
Total		*107*	*100.0*	*28*	*100.0*

Data weighted for 2013 Census data and sampling weights

Raffle/lottery

Socio-demographic variable		In-venue n	In-venue %	Offshore n	Offshore %
Gender	Male	1300	44.4	91	45.3
	Female	1629	55.6	110	54.7
Age group (years)	18-24	196	6.7	14	7.0
	25-34	445	15.2	21	10.7
	35-44	600	20.5	31	15.2
	45-54	603	20.6	40	19.7
	55-64	502	17.1	44	22.0
	65+	579	19.8	51	25.4
Ethnicity	Māori	338	11.6	24	11.8
	Pacific	130	4.5	11	5.4
	Asian	143	4.9	18	8.8
	European/Other	2285	78.0	147	73.3
NZ Individual Deprivation Index	0	1759	60.1	131	65.5
	1	611	20.9	37	18.2
	2	297	10.1	16	7.8
	3	104	3.5	14	6.8
	4	72	2.5	3	1.3
	5	49	1.7	1	0.3
	6+	37	1.3	0	0.1
Gambling behaviour					
Number of gambling activities	1	364	12.4	5	2.4
	2	789	26.9	23	11.5
	3	705	24.1	51	25.3
	4-6	882	30.1	87	43.1
	7-9	162	5.5	26	13.1
	10+	26	0.9	9	4.5
Gambling status	Infrequent	2063	70.4	105	52.1
	Regular non-continuous	621	21.2	71	35.5
	Regular continuous	245	8.4	25	12.4
Gambling frequency	At least weekly	879	30.0	98	48.6
	At least monthly	836	28.6	58	28.9
	Less frequently than monthly	1214	41.4	40	20.1
Total monthly gambling expenditure ($)	$1-$10	547	18.7	12	5.8
	$11-$20	468	16.0	27	13.2
	$21-$30	370	12.6	14	7.0
	$31-$50	438	15.0	33	16.3
	$51-$100	529	18.0	52	25.8
	$101-$500	496	16.9	48	23.7
	>$500	76	2.6	12	5.8
PGSI	Non-problem gambler	2666	91.0	180	89.8
	Low-risk gambler	168	5.7	11	5.6
	Moderate-risk gambler	69	2.3	9	4.4
	Problem gambler	27	0.9	0	0.2
Total		2929	100.0	201	100.0

Data weighted for 2013 Census data and sampling weights

Lotto

Socio-demographic variable		In-venue n	In-venue %	NZ online n	NZ online %
Gender	Male	1876	49.3	160	52.3
	Female	1929	50.7	145	47.7
Age group (years)	18-24	242	6.4	27	8.8
	25-34	609	16.0	68	22.4
	35-44	743	19.5	90	29.5
	45-54	823	21.6	56	18.3
	55-64	660	17.4	37	12.0
	65+	722	19.0	27	9.0
Ethnicity	Māori	445	11.7	33	10.8
	Pacific	180	4.7	9	2.9
	Asian	287	7.5	37	12.0
	European/Other	2849	74.9	219	71.7
NZ Individual Deprivation Index	0	2231	58.6	200	65.5
	1	817	21.5	68	22.3
	2	387	10.2	23	7.6
	3	146	3.8	8	2.8
	4	116	3.1	3	0.9
	5	58	1.5	1	0.2
	6+	49	1.3	2	0.8
Gambling behaviour					
Number of gambling activities	1	706	18.6	44	14.4
	2	1070	28.1	78	25.7
	3	827	21.8	68	22.3
	4-6	977	25.7	86	28.1
	7-9	195	5.1	25	8.2
	10+	28	0.7	4	1.3
Gambling status	Infrequent	2533	66.6	171	56.2
	Regular non-continuous	934	24.6	110	36.0
	Regular continuous	337	8.9	24	7.7
Gambling frequency	At least weekly	1290	33.9	134	43.8
	At least monthly	1170	30.8	98	32.2
	Less frequently than monthly	1344	35.3	73	24.0
Total monthly gambling expenditure ($)	$1-$10	373	9.8	14	4.7
	$11-$20	842	22.1	18	5.8
	$21-$30	544	14.3	34	11.2
	$31-$50	614	16.1	69	22.8
	$51-$100	705	18.5	75	24.5
	$101-$500	612	16.1	80	26.2
	>$500	109	2.9	15	4.8
	Not reported	2	0.1	-	
PGSI	Non-problem gambler	3431	90.2	274	89.7
	Low-risk gambler	257	6.8	22	7.2
	Moderate-risk gambler	81	2.1	8	2.6
	Problem gambler	35	0.9	1	0.4
Total		*3804*	*100.0*	*305*	*100.0*

Data weighted for 2013 Census data and sampling weights

Keno

Socio-demographic variable		In-venue n	In-venue %	NZ online n	NZ online %
Gender	Male	72	49.6	23	54.6
	Female	73	50.4	19	45.4
Age group (years)	18-24	9	6.4	6	13.3
	25-34	25	17.2	9	20.9
	35-44	29	20.2	14	33.7
	45-54	28	19.0	8	18.2
	55-64	28	19.2	2	5.8
	65+	26	18.0	3	8.0
Ethnicity	Māori	37	25.7	5	12.5
	Pacific	21	14.4	3	6.4
	Asian	16	11.3	7	16.0
	European/Other	70	48.6	25	58.7
NZ Individual Deprivation Index	0	70	48.3	30	69.7
	1	22	15.1	5	12.3
	2	24	16.3	3	7.7
	3	12	8.5	1	2.0
	4	13	9.2	1	2.8
	5	2	1.6	1	1.3
	6+	1	0.9	2	4.2
Gambling behaviour					
Number of gambling activities	1	1	0.5	0	-
	2	8	5.3	0	1.0
	3	21	14.8	10	24.5
	4-6	78	53.9	17	41.0
	7-9	30	20.6	10	23.1
	10+	7	4.9	4	10.3
Gambling status	Infrequent	55	38.0	19	43.6
	Regular non-continuous	53	36.4	15	35.9
	Regular continuous	37	25.6	9	20.6
Gambling frequency	At least weekly	90	62.0	24	56.4
	At least monthly	35	24.3	17	39.2
	Less frequently than monthly	20	13.7	2	4.3
Total monthly gambling expenditure ($)	$1-$10	3	1.9	1	2.9
	$11-$20	11	7.4	0	-
	$21-$30	15	10.3	4	8.3
	$31-$50	20	13.6	5	11.9
	$51-$100	36	25.0	9	22.2
	$101-$500	44	30.7	18	42.2
	>$500	16	11.2	5	12.5
PGSI	Non-problem gambler	111	77.0	33	78.3
	Low-risk gambler	19	13.3	5	12.7
	Moderate-risk gambler	10	6.8	3	7.6
	Problem gambler	4	2.9	1	1.4
Total		*145*	*100.0*	*43*	*100.0*

Data weighted for 2013 Census data and sampling weights

Casino

Socio-demographic variable		NZ in-venue n	NZ in-venue %	Offshore in-venue n	Offshore in-venue %
Gender	Male	329	55.8	112	49.3
	Female	261	44.2	116	50.7
Age group (years)	18-24	116	19.6	37	16.2
	25-34	156	26.5	57	24.8
	35-44	84	14.2	37	16.2
	45-54	88	15.0	34	15.1
	55-64	76	12.9	32	14.1
	65+	70	11.8	31	13.7
Ethnicity	Māori	54	9.2	17	7.3
	Pacific	41	7.0	8	3.6
	Asian	73	12.3	18	8.0
	European/Other	416	70.5	184	80.5
NZ Individual Deprivation Index	0	317	53.8	134	58.7
	1	142	24.0	69	30.1
	2	64	10.8	13	5.7
	3	32	5.4	3	1.5
	4	18	3.1	7	3.0
	5	8	1.3	1	0.4
	6+	9	1.5	1	0.6
Gambling behaviour					
Number of gambling activities	1	27	4.6	4	1.9
	2	52	8.9	13	5.5
	3	85	14.4	35	15.4
	4-6	276	46.8	94	41.3
	7-9	125	21.3	62	27.1
	10+	23	3.9	20	8.8
Gambling status	Infrequent	396	67.1	161	70.8
	Regular non-continuous	97	16.4	37	16.1
	Regular continuous	97	16.5	30	13.1
Gambling frequency	At least weekly	206	34.9	68	29.8
	At least monthly	188	31.9	83	36.4
	Less frequently than monthly	196	33.2	77	33.8
Total monthly gambling expenditure ($)	$1-$10	16	2.6	3	1.3
	$11-$20	39	6.6	15	6.5
	$21-$30	25	4.2	8	3.6
	$31-$50	76	13.0	26	11.2
	$51-$100	125	21.3	49	21.3
	$101-$500	251	42.5	98	43.1
	>$500	56	9.5	30	12.9
PGSI	Non-problem gambler	440	74.7	182	79.8
	Low-risk gambler	86	14.6	32	14.2
	Moderate-risk gambler	50	8.4	8	3.7
	Problem gambler	14	2.4	5	2.3
Total		*590*	*100.0*	*228*	*100.0*

Data weighted for 2013 Census data and sampling weights

Other offshore online

Socio-demographic variable		Other offshore online	
		n	%
Gender	Male	21	53.4
	Female	18	46.6
Age group (years)	18-24	8	20.5
	25-34	19	49.0
	35-44	8	20.1
	45-54	2	4.4
	55-64	2	6.0
	65+	-	
Ethnicity	Māori	8	20.9
	Pacific	1	3.7
	Asian	4	9.2
	European/Other	26	66.2
NZ Individual Deprivation Index	0	16	42.2
	1	8	21.4
	2	8	20.7
	3	3	7.8
	4	2	5.0
	5	0	0.6
	6+	1	2.2
Gambling behaviour			
Number of gambling activities	1	-	
	2	5	11.6
	3	3	7.5
	4-6	12	30.6
	7-9	17	43.4
	10+	3	7.0
Gambling status	Infrequent	26	68.0
	Regular non-continuous	4	9.0
	Regular continuous	9	22.9
Gambling frequency	At least weekly	12	32.0
	At least monthly	17	42.9
	Less frequently than monthly	10	25.1
Total monthly gambling expenditure ($)	$1-$10	0	1.2
	$11-$20	1	1.6
	$21-$30	2	5.9
	$31-$50	3	8.1
	$51-$100	7	19.2
	$101-$500	19	49.2
	>$500	6	14.7
PGSI	Non-problem gambler	28	72.7
	Low-risk gambler	4	10.9
	Moderate-risk gambler	2	4.5
	Problem gambler	5	11.9
Total		39	100

Data weighted for 2013 Census data and sampling weights

APPENDIX 3:
Prevalence of gambling in New Zealand and offshore horse/dog race and sports gambling by socio-demographic variables and gambling behaviour

Horse/dog race betting

		NZ venue on-site		NZ TAB		NZ TAB Online/ Remote		Offshore Online/ Remote	
Socio-demographic variable		**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Gender	Male	261	52.3	288	59.9	128	70.3	14	53.3
	Female	239	47.7	193	40.1	54	29.7	12	46.7
Age group (years)	18-24	64	12.8	52	10.8	33	18.2	4	16.0
	25-34	100	20.0	68	14.2	41	22.4	2	8.4
	35-44	100	20.0	98	20.3	26	14.3	1	2.1
	45-54	78	15.6	95	19.7	22	12.3	6	24.6
	55-64	85	17.1	85	17.7	34	18.5	9	36.0
	65+	71	14.3	84	17.4	25	13.5	3	12.9
Ethnicity	Māori	48	9.7	66	13.6	25	13.5	2	8.4
	Pacific	11	2.2	18	3.8	5	2.8	1	5.5
	Asian	10	2.1	11	2.4	3	1.6	-	
	European/Other	427	85.4	384	79.9	149	82.0	22	86.1
NZ Individual Deprivation Index	0	314	62.7	290	60.3	116	63.9	18	67.9
	1	107	21.3	92	19.1	36	19.6	5	18.0
	2	47	9.4	54	11.2	11	6.1	2	7.1
	3	12	2.3	19	4.0	8	4.4	1	4.9
	4	13	2.5	14	2.8	3	1.8	-	
	5	3	0.6	9	1.9	5	2.7	1	2.1
	6+	5	1.1	4	0.8	3	1.5	0	0.0
Gambling behaviour									
Number of gambling activities	1	20	4.0	3	0.6	2	1.4	-	
	2	44	8.8	43	9.0	7	4.0	1	5.0
	3	68	13.5	57	11.7	21	11.3	6	24.2
	4-6	250	49.9	249	51.9	82	45.1	6	23.7
	7-9	101	20.2	107	22.1	57	31.2	12	45.0
	10+	18	3.7	22	4.7	13	7.1	1	2.1
Gambling status	Infrequent	300	60.1	237	49.3	86	47.4	10	38.9
	Regular non-continuous	107	21.3	127	26.4	30	16.7	6	24.7
	Regular continuous	93	18.6	117	24.3	65	35.9	9	36.4
Gambling frequency	At least weekly	203	40.5	254	52.7	101	55.6	16	61.1
	At least monthly	157	31.4	130	26.9	57	31.5	7	25.7
	Less than monthly	140	28.1	98	20.4	23	12.9	3	13.3
Total monthly gambling expenditure ($)	$1-$10	20	4.1	7	1.	1	0.8	-	
	$11-$20	31	6.2	14	2.9	4	2.2	2	8.0
	$21-$30	29	5.7	18	3.8	4	2.0	-	
	$31-$50	52	10.4	53	11.1	8	4.5	-	
	$51-$100	116	23.2	115	24.0	29	15.9	3	12.5
	$101-$500	204	40.8	227	47.2	108	59.4	12	45.5
	>$500	46	9.2	44	9.1	28	15.2	7	26.0
	Not reported	2	0.4	2	0.4	-		2	7.9
PGSI	Non-problem gambler	419	83.7	387	80.5	136	74.8	22	85.6
	Low-risk gambler	56	11.2	67	13.9	30	16.2	2	7.9
	Moderate-risk gambler	23	4.6	22	4.6	14	7.7	2	6.5
	Problem gambler	3	0.5	5	1.0	2	1.3	-	
Total		*500*	*100.0*	*481*	*100.0*	*182*	*100.0*	*26*	*100.0*

Data weighted for 2013 Census data and sampling weights

Sports betting

Socio-demographic variable		NZ venue on-site		NZ TAB		NZ TAB Online/ Remote		Offshore Online/ Remote	
		n	%	n	%	n	%	n	%
Gender	Male	137	78.3	151	84.6	88	76.2	16	71.9
	Female	38	21.7	28	15.4	28	23.8	6	28.1
Age group (years)	18-24	39	22.0	52	28.9	38	32.7	4	17.9
	25-34	63	36.2	55	30.5	37	31.8	8	37.3
	35-44	31	18.0	26	14.4	20	17.0	4	17.2
	45-54	17	9.7	24	13.4	9	8.0	4	16.1
	55-64	16	9.2	13	7.5	6	5.1	3	11.6
	65+	9	5.0	10	5.3	6	5.3	-	
Ethnicity	Māori	25	14.2	28	15.5	18	15.7	2	9.7
	Pacific	11	6.3	8	4.7	5	4.0	1	5.6
	Asian	15	8.7	12	6.6	6	5.1	3	13.3
	European/Other	123	70.3	131	73.2	86	74.4	16	71.4
NZ Individual Deprivation Index	0	98	55.8	95	52.9	68	58.6	11	49.8
	1	47	26.5	53	29.4	27	23.7	10	45.5
	2	17	9.6	18	10.3	13	11.6	-	
	3	9	5.1	6	3.3	4	3.6	1	4.1
	4	3	1.5	5	2.6	1	0.9	0	0.6
	5	3	1.5	2	1.1	2	1.4	-	
	6+	0	0.1	1	0.5	0	0.2	0	0.0
Gambling behaviour									
Number of gambling activities	1	7	3.7	8	4.5	4	3.4	1	6.6
	2	4	2.2	4	2.1	1	0.7	-	
	3	17	9.6	17	9.4	11	9.6	3	13.5
	4-6	79	45.2	79	44.4	51	44.3	9	40.9
	7-9	60	34.4	54	30.0	41	35.8	7	33.0
	10+	9	4.9	17	9.6	7	6.2	1	6.1
Gambling status	Infrequent	106	60.6	112	62.7	75	64.6	13	58.3
	Regular non-continuous	29	16.4	29	16.0	17	15.0	3	14.1
	Regular continuous	40	23.0	38	21.3	24	20.3	6	27.5
Gambling frequency	At least weekly	72	41.3	71	39.5	43	37.1	10	47.7
	At least monthly	62	35.3	67	37.6	51	44.4	9	41.5
	Less than monthly	41	23.4	41	22.9	21	18.5	2	10.7
Total monthly gambling expenditure ($)	$1-$10	2	0.9	5	2.8	1	0.6	-	
	$11-$20	7	4.0	3	1.4	3	2.8	-	
	$21-$30	5	2.8	4	2.2	1	0.9	-	
	$31-$50	8	4.5	13	7.0	5	4.2	1	6.6
	$51-$100	42	24.2	43	24.1	30	26.3	8	36.6
	$101-$500	92	52.4	92	51.4	64	54.9	8	34.3
	>$500	20	11.3	20	11.1	12	10.4	3	13.2
	Not reported	-		-		-		2	9.3
PGSI	Non-problem gambler	136	77.8	136	75.7	93	80.1	11	51.4
	Low-risk gambler	21	12.2	26	14.6	14	11.8	5	20.8
	Moderate-risk gambler	16	9.3	15	8.4	7	6.0	6	27.9
	Problem gambler	1	0.7	2	1.2	2	2.1	-	
Total		175	100.0	179	100.0	116	100.0	22	100.0

Data weighted for 2013 Census data and sampling weights

APPENDIX 4:
Median monthly expenditure for gambling in New Zealand and offshore excluding horse/dog race and sports gambling

Wave 1

		Wave 1 (2012, baseline) N=6,251									
		New Zealand				Offshore					
		On-site		Online/Remote		On-site		Online/Remote		*Total*	
Gambling activity		**Median $**	**(Standard Error)**	**Median $**	**(Standard Error)**	**Median $**	**(Standard Error)**	**Median $**	**(Standard Error)**	***Median $***	***(Standard Error)***
Cards	Poker: private residence	9.78	(1.25)	N/A		N/A		N/A		*9.78*	*(1.25)*
	Poker: commercial	17.04	(2.48)	N/A		N/A		11.74	(5.82)	*17.85*	*(2.80)*
	Other cards not poker	#		N/A		#		#		#	
	Any cards	#		*N/A*		#		#		#	
Lotteries, raffles, keno	Raffle/lottery	4.47	(0.08)	N/A		#				#	
	Lotto	15.26	(0.17)	15.48	(1.48)	N/A		N/A		*15.58*	*(0.17)*
	Keno	5.65	(0.56)	7.21	(1.21)	N/A		N/A		*5.91*	*(0.49)*
	Any raffles/lotteries	*15.34*	*(0.17)*	*15.97*	*(1.37)*	#				#	
Casino/EGM	Casino (Table/EGM)	26.93	(4.16)	N/A		17.72	(1.29)	N/A		*28.13*	*(4.17)*
	EGMs (Pub/Club)	17.93	(1.73)	N/A		N/A)		N/A		*17.93*	*(1.73)*
	Any casino or EGMs	*19.84*	*(2.13)*	*N/A*		*17.72*	*(1.29)*	*N/A*		*23.41*	*(2.47)*
Other	Housie/bingo	#		N/A		#		#		*19.24*	*(2.35)*
	Other offshore online gambling†	N/A		N/A		N/A		19.31	(3.44)	*19.31*	*(3.44)*

Unknown as not specifically asked in survey

† Includes: Internet casino games and EGMs - not cards, internet bingo, event betting, skill games, virtual sport, raffle/lottery and non-specified gambling

Data weighted for 2013 Census data and sampling weights

N/A = Not applicable

Wave 2

Gambling activity		Wave 2 (2013) N=3,745									
		New Zealand				Offshore					
		On-site		Online/Remote		On-site		Online/Remote		*Total*	
		Median $	(Standard Error)	Median $	(Standard Error)	Median $	(Standard Error)	Median $	(Standard Error)	*Median $*	*(Standard Error)*
Cards	Poker: private residence	14.23	(2.66)	N/A		N/A		N/A		*14.23*	*(2.66)*
	Poker: commercial	30.96	(15.17)	N/A		N/A		6.56	(2.00)	*22.01*	*(15.49)*
	Other cards not poker	#		N/A		#		#		#	
	Any cards	#		*N/A*		#		#		#	
Lotteries, raffles, keno	Raffle/lottery	4.45	(0.12)	N/A		#				#	
	Lotto	15.09	(0.16)	15.36	(1.40)	N/A		N/A		*15.48*	*(0.17)*
	Keno	4.58	(0.95)	5.33	(0.92)	N/A		N/A		*5.12*	*(1.07)*
	Any raffles/lotteries	*15.13*	*(0.16)*	*15.56*	*(1.57)*	#				#	
Casino/EGM	Casino (Table/EGM)	27.47	(4.14)	N/A		34.31	(6.43)	N/A		*35.16*	*(4.51)*
	EGMs (Pub/Club)	17.71	(1.87)	N/A		N/A		N/A		*17.71*	*(1.87)*
	Any casino or EGMs	*19.91*	*(2.43)*	*N/A*		*34.31*	*(6.43)*	*N/A*		*22.13*	*(2.52)*
Other	Housie/bingo	#		N/A		#		#		*19.82*	*(4.40)*
	Other offshore online gambling†	N/A		N/A		N/A		8.47	(2.92)	*8.47*	*(2.92)*

Unknown as not specifically asked in survey

† Includes: Internet casino games and EGMs - not cards, internet bingo, event betting, skill games and virtual sport

Data weighted for 2013 Census data, sampling weights and attrition by age, gender, ethnicity and PGSI category at Wave 1

N/A = Not applicable

Wave 3

		Wave 3 (2014) N=3,115									
		New Zealand				Offshore					
		On-site		Online/Remote		On-site		Online/Remote		*Total*	
Gambling activity		**Median $**	**(Standard Error)**	**Median $**	**(Standard Error)**	**Median $**	**(Standard Error)**	**Median $**	**(Standard Error)**	***Median $***	***(Standard Error)***
Cards	Poker: private residence	17.12	(3.35)	N/A		N/A		N/A		*17.12*	*(3.35)*
	Poker: commercial	16.73	(7.00)	N/A		N/A		28.80	-	*18.14*	*(6.92)*
	Other cards not poker	#		N/A		#		#		#	
	Any cards	#		*N/A*		#		#		#	
Lotteries, raffles, keno	Raffle/lottery	4.48	(0.13)	N/A		#				#	
	Lotto	15.61	(0.26)	15.71	(1.31)	N/A		N/A		*16.91*	*(0.55)*
	Keno	4.16	(0.61)	4.76	(1.62)	N/A		N/A		*4.53*	*(0.66)*
	Any raffles/lotteries	*15.68*	*(0.26)*	*17.56*	*(1.27)*	#				#	
Casino/EGM	Casino (Table/EGM)	31.52	(4.77)	N/A		17.24	(3.23)	N/A		*35.55*	*(4.92)*
	EGMs (Pub/Club)	17.17	(1.72)	N/A		N/A		N/A		*17.17*	*(1.72)*
	Any casino or EGMs	*19.72*	*(1.93)*	*N/A*		*17.24*	*(3.23)*	*N/A*		*24.38*	*(2.72)*
Other	Housie/bingo	#		N/A		#		#		*23.21*	*(6.00)*
	Other offshore online gambling †‡	N/A		N/A		N/A		7.93	(0.03)	*7.93*	*(0.03)*

Unknown as not specifically asked in survey
† Includes: Internet casino games and EGMs - not cards, internet bingo, event betting, skill games and non-specified gambling
‡ Excludes one response of $12,000
Data weighted for 2013 Census data, sampling weights and attrition by age, gender, ethnicity and PGSI category from Wave 1 to Wave 2
N/A = Not applicable

APPENDIX 5:
Bivariate (unadjusted) and multiple logistic regression (adjusted) odds ratios and 95% confidence intervals for gambling excluding horse/dog race and sports gambling

Commercial poker - offshore

		Unadjusted			Adjusted	
	% Offshore	Odds Ratio	(95% CI)	p-value	Odds Ratio	(95% CI)	p-value
Country of birth							
NZ born	28.4	1.00					
Other	8.6	0.24	(0.08, 0.71)	0.01			
Religion							
Not religious	30.6	1.00			1.00		
Religious	11.6	0.30	(0.10, 0.86)	0.03	0.10	(0.03, 0.39)	0.0009
Highest qualification							
No formal qual.	25.6	1.00			1.00		
Secondary school qual.	8.4	0.27	(0.05, 1.43)		0.09	(0.01, 1.08)	
Vocational/Trade qual.	37.6	1.75	(0.39, 7.76)		5.90	(0.99, 35.15)	
University degree/above	30.3	1.26	(0.30, 5.40)	0.15	4.19	(0.57, 30.97)	0.003
Labour force status							
Employed	20.4	1.00			1.00		
Unemployed	54.5	4.67	(1.19, 18.40)		15.11	(2.21, 103.33)	
Other	21.7	1.08	(0.23, 5.13)	0.08	0.87	(0.18, 4.29)	0.02
Gambling frequency							
At least weekly	35.2	22.88	(2.45, 213.75)				
At least monthly	22.4	12.17	(1.14, 130.33)				
Less than monthly	2.3	1.00		0.02			
No. life events							
0	32.7	1.00					
1	2.7	0.06	(0.01, 0.38)				
2	10.2	0.24	(0.04, 1.59)				
3	17.5	0.44	(0.06, 3.19)				
4	45.5	1.73	(0.36, 8.32)				
5+	30.1	0.89	(0.20, 3.97)	0.03			
Quality of life (WHOQoL-8)							
Below median (0-24)	36.9	3.62	(0.77, 17.06)		8.42	(1.76, 40.4)	
Median score (25)	8.4	0.57	(0.05, 6.83)		0.63	(0.04, 9.85)	
Above median (26-32)	13.9	1.00		0.10	1.00		0.004
No drug use							
No	33.5	1.00					
Yes	13.5	0.31	(0.11, 0.91)	0.03			

Raffle/lottery - offshore

		Unadjusted			Adjusted		
	% Offshore	Odds Ratio	(95% CI)	p-value	Odds Ratio	(95% CI)	p-value
Age group (years)							
18-24	7.0	1.00					
25-34	4.7	0.66	(0.29, 1.52)		0.96	(0.43, 2.13)	
35-44	5.1	0.71	(0.33, 1.53)		1.11	(0.53, 2.33)	
45-54	6.4	0.92	(0.43, 1.97)		1.74	(0.84, 3.60)	
55-64	8.5	1.25	(0.58, 2.67)		2.46	(1.15, 5.25)	
65+	8.6	1.25	(0.60, 2.61)	0.09	2.91	(1.42, 5.93)	0.001
Arrival in NZ							
Before 2008	7.0	1.15	(0.77, 1.70)		1.11	(0.71, 1.73)	
Since 2008	23.1	4.60	(2.28, 9.28)		9.07	(3.93, 20.98)	
NZ born	6.1	1.00		0.0001	1.00		<0.0001
Religion							
Not religious	4.8	1.00					
Religious	7.8	1.69	(1.17, 2.46)	0.01			
Household size							
1	7.1	1.00					
2	8.2	1.17	(0.76, 1.80)				
3	8.4	1.20	(0.70, 2.05)				
4	4.1	0.56	(0.32, 0.99)				
5+	4.7	0.64	(0.33, 1.24)	0.02			
Location							
Auckland	8.1	1.00					
Wellington	10.1	1.28	(0.74, 2.20)		1.42	(0.78, 2.56)	
Christchurch	8.4	1.05	(0.56, 1.98)		1.03	(0.49, 2.16)	
Rest of NZ	5.3	0.64	(0.44, 0.92)	0.01	0.65	(0.43, 1.00)	0.03
NZ individual deprivation index							
0	7.3	1.00			1.00		
1	5.9	0.79	(0.49, 1.27)		0.72	(0.44, 1.17)	
2	5.2	0.70	(0.40, 1.22)		0.79	(0.44, 1.43)	
3	12.4	1.80	(0.98, 3.31)		2.10	(1.02, 4.34)	
4	3.6	0.48	(0.15, 1.57)		0.73	(0.20, 2.72)	
5+	0.9	0.11	(0.03, 0.50)	0.01	0.15	(0.04, 0.63)	0.01
No. gambling activities							
1-2	2.4	1.00			1.00		
3	7.0	3.11	(1.83, 5.28)		3.22	(1.85, 5.61)	
4-6	9.7	4.38	(2.69, 7.12)		5.53	(3.26, 9.38)	
7-9	15.4	7.45	(4.00, 13.88)		11.62	(5.72, 23.61)	
10+	33.5	20.65	(7.16, 59.51)	<0.0001	39.62	(13.45, 116.71)	<0.0001
Gambling status							
Infrequent	5.0	1.00			1.00		
Regular non-continuous	11.2	2.40	(1.69, 3.41)		1.72	(1.15, 2.56)	
Regular continuous	9.9	2.10	(1.26, 3.50)	<0.0001	0.86	(0.50, 1.48)	0.008
Gambling frequency							
At least weekly	10.8	3.57	(2.29, 5.56)				
At least monthly	6.8	2.14	(1.32, 3.48)				
Less than monthly	3.3	1.00		<0.0001			

		Unadjusted			Adjusted		
	% Offshore	Odds Ratio	(95% CI)	p-value	Odds Ratio	(95% CI)	p-value
Total monthly gambling expenditure							
$1-$10	2.1	1.00					
$11-$20	5.5	2.70	(1.32, 5.52)				
$21-$30	3.7	1.80	(0.80, 4.06)				
$31-$50	7.3	3.63	(1.85, 7.12)				
$51-$100	9.5	4.87	(2.55, 9.30)				
$101-$500	9.4	4.81	(2.54, 9.12)				
>$500	14.1	7.60	(3.06, 18.9)	<0.0001			
Separating money for betting from other money							
No	6.4	1.00					
Yes	13.8	2.35	(1.27, 4.34)	0.01			
Leaving ATM/credit cards at home							
No	6.5	1.00					
Yes	19.2	3.42	(1.51, 7.73)	0.003			
Psychological distress (K-10)							
0-5	6.7						
6-11	6.7	1.01	(0.67, 1.52)				
12-19	4.1	0.60	(0.30, 1.23)				
20+	18.8	3.26	(1.23, 8.63)	0.05			
Ever smoked tobacco							
Yes	5.9	0.66	(0.47, 0.92)		0.61	(0.42, 0.89)	
No	8.7	1.00		0.01	1.00		0.01

Lotto - online (NZ)

		Unadjusted			Adjusted		
	% Online	Odds Ratio	(95% CI)	p-value	Odds Ratio	(95% CI)	p-value
Age group (years)							
18-24	11.0	1.00			1.00		
25-34	10.9	0.99	(0.49, 2.01)		0.77	(0.36, 1.62)	
35-44	11.6	1.07	(0.54, 2.10)		0.73	(0.35, 1.53)	
45-54	6.6	0.58	(0.28, 1.18)		0.38	(0.18, 0.82)	
55-64	5.5	0.47	(0.23, 0.98)		0.28	(0.13, 0.63)	
65+	3.7	0.31	(0.15, 0.67)	<0.0001	0.24	(0.10, 0.54)	<0.0001
Ethnicity							
Māori	7.3	0.98	(0.68, 1.40)		1.06	(0.72, 1.58)	
Pacific	4.9	0.63	(0.35, 1.14)		0.34	(0.18, 0.65)	
Asian	12.4	1.75	(1.19, 2.58)		0.66	(0.40, 1.10)	
European/Other	7.5	1.00		0.01	1.00		0.008
Country of birth							
NZ born	6.6	1.00			1.00		
Other	11.4	1.84	(1.37, 2.47)	<0.0001	1.84	(1.22, 2.76)	0.003
Highest qualification							
No formal qual.	3.0	1.00			1.00		
Secondary school qual.	7.9	2.77	(1.55, 4.94)		2.01	(1.11, 3.66)	
Vocational/Trade qual.	5.8	1.99	(1.12, 3.54)		1.50	(0.83, 2.74)	
University degree/above	11.1	4.00	(2.39, 6.71)	<0.0001	3.16	(1.78, 5.60)	0.0001
Household size							
1	4.7	1.00					
2	6.9	1.50	(0.96, 2.34)				
3	7.8	1.71	(1.03, 2.85)				
4	10.0	2.24	(1.37, 3.66)				
5+	9.1	2.01	(1.16, 3.50)	0.02			
Annual personal income							
<$20,000	6.2	1.00					
$20,001-$40,000	6.6	1.08	(0.69, 1.68)				
$40,001-$60,000	7.0	1.15	(0.72, 1.84)				
$60,001-$80,000	10.7	1.82	(1.12, 2.96)				
$80,001-$100,000	9.8	1.66	(0.90, 3.06)				
>$100,000	15.5	2.79	(1.66, 4.71)				
Not reported	6.6	1.08	(0.53, 2.20)	0.001			
Annual household income							
<$20,000	4.4	1.00					
$20,001-$40,000	4.1	0.93	(0.52, 1.67)				
$40,001-$60,000	4.3	0.98	(0.54, 1.80)				
$60,001-$80,000	9.6	2.32	(1.35, 3.99)				
$80,001-$100,000	8.4	2.01	(1.22, 3.30)				
>$100,000	12.1	2.99	(1.98, 4.51)				
Not reported	6.6	1.55	(0.83, 2.88)	<0.0001			
Location							
Auckland	10.0	1.00					
Wellington	10.9	1.03	(0.51, 2.07)				
Christchurch	10.3	0.56	(0.41, 0.77)				
Rest of NZ	5.9	1.09	(0.70, 1.70)	0.0006			
NZ individual deprivation index							
0	8.7	1.00					
1	8.1	0.93	(0.64, 1.35)				
2	5.9	0.65	(0.40, 1.08)				
3	5.7	0.64	(0.35, 1.17)				
4	2.2	0.24	(0.09, 0.61)				
5+	2.8	0.30	(0.10, 0.91)	0.01			

		Unadjusted			Adjusted		
	% Online	Odds Ratio	(95% CI)	p-value	Odds Ratio	(95% CI)	p-value
No. gambling activities							
1	6.1	1.00			1.00		
2	7.2	1.19	(0.76, 1.85)		0.77	(0.46, 1.27)	
3	7.9	1.32	(0.83, 2.10)		0.52	(0.30, 0.91)	
4-6	8.6	1.44	(0.91, 2.28)		0.40	(0.22, 0.73)	
7-9	12.8	2.25	(1.22, 4.14)		0.52	(0.25, 1.08)	
10+	14.7	2.64	(0.81, 8.66)	0.10	0.50	(0.12, 2.05)	0.04
Gambling status							
Infrequent	6.7	1.00					
Regular non-continuous	11.2	1.78	(1.31, 2.41)				
Regular continuous	7.0	1.06	(0.63, 1.77)	0.0008			
Gambling frequency							
At least weekly	10.0	1.95	(1.35, 2.83)				
At least monthly	8.2	1.56	(1.05, 2.32)				
Less than monthly	5.4	1.00		0.002			
Total monthly gambling expenditure							
$1-$10	3.7	1.00			1.00		
$11-$20	2.1	0.55	(0.25, 1.19)		0.58	(0.26, 1.31)	
$21-$30	6.2	1.69	(0.85, 3.37)		2.09	(0.96, 4.52)	
$31-$50	10.9	3.17	(1.62, 6.18)		4.51	(2.10, 9.66)	
$51-$100	10.2	2.94	(1.55, 5.56)		5.27	(2.45, 11.34)	
$101-$500	12.9	3.81	(2.01, 7.20)		8.73	(3.87, 19.67)	
>$500	13.3	3.97	(1.73, 9.11)	<0.0001	10.97	(3.94, 30.51)	<0.0001
Have method to manage gambling							
Yes	9.8	1.00					
No	7.0	0.70	(0.52, 0.94)	0.02			
Setting a dollar amount for gambling before leaving home							
No	6.8	1.00					
Yes	11.9	1.85	(1.36, 2.53)	0.0001			
Quality of life (WHOQoL-8)							
Below median (0-24)	6.1	0.67	(0.49, 0.91)				
Median score (25)	11.1	1.31	(0.84, 2.02)				
Above median (26-32)	8.8	1.00		0.005			
Psychological distress (K-10)							
0-5	8.7	1.00			1.00		
6-11	5.0	0.55	(0.35, 0.87)		0.99	(0.53, 1.85)	
12-19	7.2	0.81	(0.44, 1.48)		0.21	(0.05, 0.83)	
20+	2.3	0.25	(0.07, 0.83)	0.01	0.51	(0.32, 0.81)	0.006
No drug use							
No	4.9	1.00			1.00		
Yes	8.3	1.76	(1.11, 2.80)	0.02	2.12	(1.27, 3.53)	0.004
Cannabis use							
No	8.2	1.00					
Yes	4.8	0.57	(0.34, 0.94)	0.03			
Ever smoked tobacco							
Yes	7.0	0.70	(0.52, 0.93)		0.72	(0.52, 1.00)	
No	9.8	1.00		0.02	1.00		0.05

Casino - offshore

		Unadjusted			Adjusted		
	% Offshore	Odds Ratio	(95% CI)	p-value	Odds Ratio	(95% CI)	p-value
Ethnicity							
Māori	25.3	0.62	(0.36, 1.07)				
Pacific	19.1	0.43	(0.23, 0.82)				
Asian	22.0	0.52	(0.29, 0.91)				
European/Other	35.4	1.00		0.01			
Annual personal income							
<$20,000	30.1	1.00			1.00		
$20,001-$40,000	28.3	0.92	(0.51, 1.64)		0.85	(0.46, 1.58)	
$40,001-$60,000	25.1	0.78	(0.43, 1.41)		0.56	(0.28, 1.10)	
$60,001-$80,000	29.7	0.98	(0.46, 2.09)		0.79	(0.32, 1.98)	
$80,001-$100,000	57.2	3.10	(1.27, 7.56)		2.41	(0.85, 6.83)	
>$100,000	62.4	3.85	(1.60, 9.29)		2.62	(1.05, 6.52)	
Not reported	30.6	1.02	(0.41, 2.56)	0.003	0.74	(0.24, 2.23)	0.009
Location							
Auckland	28.1	1.00			1.00		
Wellington	59.7	3.80	(1.77, 8.12)		4.03	(1.62, 10.03)	
Christchurch	26.8	0.94	(0.42, 2.09)		0.94	(0.42, 2.09)	
Rest of NZ	30.3	1.12	(0.72, 1.74)	0.005	1.21	(0.74, 1.98)	0.02
NZ individual deprivation index							
0	33.6	1.00			1.00		
1	38.6	1.24	(0.76, 2.02)		1.22	(0.71, 2.10)	
2	19.0	0.47	(0.20, 1.06)		0.48	(0.19, 1.21)	
3	9.7	0.21	(0.07, 0.69)		0.21	(0.05, 0.83)	
4	33.9	1.02	(0.38, 2.73)		1.44	(0.48, 4.29)	
5+	12.2	0.28	(0.09, 0.86)	0.01	0.37	(0.11, 1.28)	0.05
No. gambling activities							
1	13.7	1.00					
2	20.9	1.66	(0.41, 6.73)		1.83	(0.41, 8.07)	
3	31.1	2.83	(0.77, 10.37)		3.83	(0.98, 14.97)	
4-6	27.7	2.41	(0.71, 8.15)		3.13	(0.84, 11.65)	
7-9	42.3	4.61	(1.32, 16.10)		6.97	(1.69, 28.63)	
10+	75.4	19.28	(4.18, 88.92)	<0.0001	37.23	(7.05, 196.72)	<0.0001
Most enjoyable mode of gambling							
None	45.8	1.00			1.00		
Other than casino	28.8	0.48	(0.26, 0.89)		0.41	(0.21, 0.80)	
Casino	32.1	0.56	(0.29, 1.08)	0.07	0.81	(0.39, 1.69)	0.01
Setting a dollar amount for gambling before leaving home							
No	35.7	1.00			1.00		
Yes	27.1	0.67	(0.44, 1.01)	0.06	0.60	(0.37, 0.98)	0.04
Getting someone you trust to manage the money							
No	32.2	1.00					
Yes	6.4	0.15	(0.03, 0.77)	0.02			
Ever smoked more than 100 cigarettes in lifetime							
Yes	26.7	0.64	(0.43, 0.96)				
No	36.4	1.00		0.03			
Ever smoked daily for a period of time							
Yes	26.1	0.61	(0.41, 0.92)				
No	36.6	1.00		0.02			
How often do you now smoke							
Does not smoke now	31.4	0.80	(0.49, 1.32)		0.81	(0.48, 1.37)	
At least once a week	21.7	0.49	(0.29, 0.82)		0.46	(0.25, 0.84)	
Never a smoker	36.4	1.00		0.02	1.00		0.04

APPENDIX 6:
Bivariate (unadjusted) and multiple logistic regression (adjusted) odds ratios and 95% confidence intervals for horse/dog race and sports gambling

Horse/dog race betting - online/remote (NZ and offshore)

		Unadjusted			Adjusted		
	% Online	Odds Ratio	(95% CI)	p-value	Odds Ratio	(95% CI)	p-value
Gender							
Male	33.7	2.21	(1.43, 3.40)				
Female	18.7	1.00		0.0003			
Arrival in NZ							
Before 2008	14.2	0.40	(0.21, 0.76)				
Since 2008	29.0	1.00	(0.17, 5.94)				
NZ born	29.0	1.00		0.02			
Country of birth							
NZ born	29.0	1.00			1.00		
Other	15.8	0.46	(0.25, 0.84)	0.01	0.43	(0.21, 0.89)	0.02
Religion							
Not religious	35.1	1.00			1.00		
Religious	20.6	0.48	(0.32, 0.73)	0.0006	0.57	(0.35, 0.92)	0.02
Annual household income							
<$20,000	24.3	1.00			1.00		
$20,001-$40,000	25.5	2.60	(1.22, 5.54)		1.21	(0.56, 2.61)	
$40,001-$60,000	16.7	1.07	(0.53, 2.15)		0.65	(0.28, 1.50)	
$60,001-$80,000	28.6	0.63	(0.28, 1.41)		1.16	(0.53, 2.54)	
$80,001-$100,000	20.9	1.25	(0.58, 2.67)		0.82	(0.37, 1.83)	
>$100,000	26.5	0.82	(0.37, 1.82)		0.99	(0.54, 1.81)	
Not reported	45.5	1.12	(0.65, 1.94)	0.11	3.85	(1.60, 9.28)	0.04
No. gambling activities							
1	11.5	1.00					
2	12.4	1.09	(0.19, 6.39)				
3	25.4	2.64	(0.51, 13.59)				
4-6	23.0	2.31	(0.48, 11.27)				
7-9	41.7	5.52	(1.11, 27.52)				
10+	52.9	8.70	(1.35, 56.16)	0.0004			
Gambling status							
Infrequent	22.2	1.00			1.00		
Regular non-continuous	19.9	0.87	(0.51, 1.50)		0.63	(0.35, 1.14)	
Regular continuous	49.0	3.37	(2.05, 5.54)	<0.0001	2.02	(1.11, 3.68)	0.002
Gambling frequency							
At least weekly	33.2	3.05	(1.76, 5.26)				
At least monthly	28.6	2.46	(1.30, 4.64)				
Less than monthly	14.0	1.00		0.0003			
Most enjoyable mode of gambling							
None	50.1	1.00			1.00		
Other than horse/dog	25.8	0.35	(0.17, 0.72)		0.27	(0.12, 0.59)	
Horse/dog race betting	23.6	0.31	(0.15, 0.63)	0.01	0.35	(0.17, 0.74)	0.004
Total monthly gambling expenditure							
$1-$10	5.2	1.00			1.00		
$11-$20	15.3	3.28	(0.31, 35.23)		3.54	(0.30, 42.3)	
$21-$30	8.1	1.60	(0.14, 17.89)		1.68	(0.13, 21.74)	
$31-$50	9.3	1.87	(0.19, 18.8)		2.08	(0.20, 21.92)	
$51-$100	17.2	3.76	(0.45, 31.31)		5.00	(0.54, 46.36)	
$101-$500	38.5	11.36	(1.40, 91.89)		11.57	(1.29, 104.19)	
>$500	54.7	21.90	(2.53, 189.87)	<0.0001	17.74	(1.72, 182.67)	<0.0001

		Unadjusted			Adjusted		
	% Online	Odds Ratio	(95% CI)	p-value	Odds Ratio	(95% CI)	p-value
Problem gambling severity (PGSI)							
Non-problem gambler	23.9	1.00					
Low-risk gambler	39.3	2.06	(1.08, 3.92)				
Moderate-risk gambler	49.5	3.12	(1.40, 6.94)				
Problem gambler	42.2	2.32	(0.54, 9.91)	0.007			
Have method to manage gambling							
Yes	31.7	1.00					
No	23.2	0.65	(0.43, 0.99)	0.04			
Getting someone you trust to manage the money							
No	26.4	1.00					
Yes	71.2	6.91	(1.34, 35.68)	0.02			
No drug use							
No	39.7	1.00					
Yes	23.8	0.48	(0.28, 0.81)	0.006			
Cannabis use							
No	23.9	1.00					
Yes	41.6	2.27	(1.29, 3.99)	0.004			

Sports betting - online/remote (NZ and offshore)

		Unadjusted			Adjusted	
	% Online	Odds Ratio	(95% CI)	p-value	Odds Ratio	(95% CI)	p-value
Religion							
Not religious	50.9	1.00					
Religious	34.4	0.51	(0.27, 0.95)	0.03	0.44	(0.23, 0.84)	0.01
Have method to manage gambling							
Yes	52.0	1.00					
No	36.1	0.52	(0.28, 0.98)	0.04			
Separating money for betting from other money							
No	41.6	1.00					
Yes	78.8	5.22	(1.76, 15.47)	0.003	6.04	(2.15, 17.03)	0.0007
Ever smoked more than 100 cigarettes in lifetime							
Yes	35.2	0.51	(0.27, 0.97)		0.47	(0.24, 0.92)	
No	51.7	1.00		0.04			0.03

Horse/dog race betting and sports betting combined - online/remote (offshore)

		Unadjusted			Adjusted	
	% Online	Odds Ratio	(95% CI)	p-value	Odds Ratio	(95% CI)	p-value
Country of birth							
NZ born	4.5	1.00			1.00		
Other	9.4	2.19	(0.89, 5.39)	0.09	2.55	(1.03, 6.34)	0.04
Household size							
1	0.8	1.00					
2	5.9	7.48	(1.98, 28.33)				
3	4.1	5.09	(1.04, 24.88)				
4	5.9	7.51	(1.84, 30.69)				
5+	7.6	9.94	(2.22, 44.48)	0.03			
Annual household income							
<$20,000	0.9	1.00					
$20,001-$40,000	4.4	4.97	(1.10, 22.45)				
$40,001-$60,000	6.9	7.98	(1.90, 33.54)				
$60,001-$80,000	9.1	10.86	(2.80, 42.16)				
$80,001-$100,000	7.9	9.32	(2.29, 37.87)				
>$100,000	5.0	5.68	(1.54, 20.89)				
Not reported	4.4	4.96	(0.95, 25.92)	0.02			
Total monthly gambling expenditure							
$1-$50	1.6	1.00			1.00		
$51-$100	5.1	3.77	(0.82, 17.32)		3.99	(0.90, 17.64)	
$101-$500	5.7	3.40	(0.63, 18.25)		3.34	(0.63, 17.68)	
>$500	16.4	12.36	(2.34, 65.36)	0.02	13.27	(2.59, 67.90)	0.01
Setting a time limit for gambling							
No	4.9	1.00					
Yes	20.7	5.08	(0.99, 25.96)	0.05			
Ever smoked tobacco							
Yes	4.2	0.44	(0.20, 0.96)				
No	9.1	1.00		0.04			

APPENDIX 7:
Transitions over time

Lotto online (Yes) vs. Lotto not online (No)

			Wave 1		Wave 2			Wave 3		
Wave 1	Wave 2	Wave 3	n*	%	n*	%	% drop out	n*	%	% drop out
No	No	No	3588	57.4%	1716	78.6%	-	1201	85.1%	-
		Yes						68	4.8%	-
		OG						75	5.4%	-
		NG						66	4.7%	-
		LFU						305	-	17.8%
	Yes	No			89	4.1%	-	33	42.7%	-
		Yes						42	54.2%	-
		OG						1	0.8%	-
		NG						2	2.2%	-
		LFU						10	-	11.8%
	OG	No			208	9.5%	-	59	34.3%	--
		Yes						3	1.8%	--
		OG						68	39.5%	--
		NG						42	24.4%	-
		LFU						37	-	17.7%
	NG	No			172	7.9%	-	52	38.7%	-
		Yes						8	5.9%	-
		OG						31	23.1%	-
		NG						44	32.3%	-
		LFU						36	-	21.0%
	LFU				1403	-	39.1%	-	-	-
Yes	No	No	305	4.9%	50	26.4%		21	49.6%	-
		Yes						15	35.4%	-
		OG						2	4.5%	-
		NG						4	10.4%	-
		LFU						7	-	14.5%
	Yes	No			114	59.8%	-	9	9.0%	-
		Yes						83	86.5%	-
		OG						1	0.9%	-
		NG						3	3.6%	-
		LFU						19	-	16.4%
	OG	No			19	10.0%	-	6	40.1%	-
		Yes						3	15.6%	-
		OG						5	31.3%	-
		NG						2	12.9%	-
		LFU						3	-	15.5%
	NG	No			7	3.8%	-	1	20.0%	-
		Yes						1	10.8%	-
		OG						1	21.6%	-
		NG						2	47.7%	-
		LFU						2	-	29.0%
	LFU				114	-	37.3%	-	-	-
OG	No	No	1097	17.5%	138	22.3%	-	73	61.6%	-
		Yes						1	1.0%	-
		OG						33	27.9%	-
		NG						11	9.5%	-
		LFU						20	-	14.1%
	Yes	No			16	2.6%	-	4	26.2%	-
		Yes						9	65.0%	-
		OG						0	-	-
		NG						1	8.8%	-
		LFU						2	--=	15.3%
	OG	No			303	48.8%	-	47	17.5%	-
		Yes						12	4.5%	-
		OG						144	53.3%	-
		NG						67	24.6%	-
		LFU						32	-	10.7%
	NG	No			164	26.4%	-	9	6.5%	-

Wave 1	Wave 2	Wave 3	Wave 1		Wave 2			Wave 3		
			n*	%	n*	%	% drop out	n*	%	% drop out
		Yes						0	-	-
		OG						45	31.9%	-
		NG						86	61.6%	-
		LFU						24	-	14.7%
	LFU				475	-	43.3%	-	-	-
NG	No	No	1261	20.2%	107	14.3%		38	43.3%	-
		Yes						3	3.1%	-
		OG						21	24.2%	-
		NG						26	29.4%	-
		LFU						19	-	17.9%
	Yes	No			6	0.7%		0	-	-
		Yes						3	56.2%	-
		OG						3	43.8%	-
		NG						0	-	-
		LFU						0	-	-
	OG	No			151	20.2%		19	15.1%	-
		Yes						1	0.8%	-
		OG						42	33.8%	-
		NG						63	50.4%	-
		LFU						26	-	17.0%
	NG	No			485	64.7%		31	7.6%	-
		Yes						4	1.1%	-
		OG						62	15.4%	-
		NG						307	75.9%	-
		LFU						80	-	16.6%
	LFU				513	-	40.6%	-	-	-

NG = No gambling in last 12 months
OG = Other gambling activities
LFU = Lost to follow-up
Yes = Any online Lotto gambling
No = Lotto shop gambling but no Lotto online gambling

Horse/dog race gambling online/remotely in NZ or offshore (Yes) vs. NZ venue based horse/dog race gambling (No)

			Wave 1		Wave 2			Wave 3		
Wave 1	Wave 2	Wave 3	n*	%	n*	%	% drop out	n*	%	% drop out
No	No	No	535	8.6%	139	43.4%	-	60	51.2%	-
		Yes						9	8.0%	-
		OG						42	36.0%	-
		NG						6	4.8%	-
		LFU						21	-	15.5%
	Yes	No			25	7.8%	-	6	47.3%	-
		Yes						5	37.2%	-
		OG						2	15.5%	-
		NG						0	-	-
		LFU						13	-	51.8%
	OG	No			139	43.6%	-	24	20.9%	-
		Yes						3	2.5%	-
		OG						86	74.4%	-
		NG						2	2.1%	-
		LFU						24	-	17.2%
	NG	No			17	5.2%	-	1	3.8%	-
		Yes						0	-	-
		OG						11	68.4%	-
		NG						5	27.8%	-
		LFU						0	-	-
	LFU				216	-	40.3%		-	-
Yes	No	No	197	3.1%	18	15.4%	-	7	48.3%	-
		Yes						2	14.8%	-
		OG						5	36.9%	-
		NG						0	-	-
		LFU						3	-	18.3%
	Yes	No			54	46.3%	-	5	11.9%	-
		Yes						29	65.4%	-
		OG						10	22.7%	-
		NG						-	0.0%	-
		LFU						10	-	18.1%
	OG	No			44	38.3%	-	8	21.9%	-
		Yes						1	2.3%	-
		OG						28	73.8%	-
		NG						1	2.0%	-
		LFU						6	-	14.0%
	NG	No			0	-	-	0	-	-
		Yes						0	-	-
		OG						0	-	-
		NG						0	-	-
		LFU						0	-	-
	LFU				81	-	41.2%	-	-	-
OG	No	No	4258	68.1%	126	4.9%	-	36	35.4%	-
		Yes						3	2.7%	-
		OG						62	61.3%	-
		NG						1	0.6%	-
		LFU						24	-	19.3%
	Yes	No			23	0.9%	-	2	9.2%	-
		Yes						11	54.3%	-
		OG						6	28.0%	-
		NG						2	8.5%	-
		LFU						3	-	14.7%
	OG	No			2086	81.4%	-	60	3.4%	-
		Yes						5	0.3%	-
		OG						1503	85.6%	-
		NG						188	10.7%	-
		LFU						330	-	15.8%
	NG	No			327	12.8%	-	2	0.9%	-
		Yes						0	0.2%	-

Wave 1	Wave 2	Wave 3	Wave 1		Wave 2			Wave 3		
			n*	%	n*	%	% drop out	n*	%	% drop out
		OG						134	50.5%	-
		NG						128	48.4%	-
		LFU						62	-	19.1%
	LFU				1696		39.8%		-	-
NG	No	No	1261	20.2%	8	1.0%	-	2	24.0%	-
		Yes						0	-	-
		OG						3	48.1%	-
		NG						2	27.9%	-
		LFU						1	-	7.4%
	Yes	No			2	0.2%	-		-	-
		Yes						2	100.0%	-
		OG						0	-	-
		NG						0	-	-
		LFU						0	-	-
	OG	No			254	34.0%	-	8	3.7%	-
		Yes						0	-	-
		OG						116	54.9%	-
		NG						87	41.4%	-
		LFU						44	-	17.2%
	NG	No			485	64.7%	-	4	1.0%	-
		Yes						0	-	-
		OG						93	23.1%	-
		NG						307	75.9%	-
		LFU						80	-	16.6%
	LFU				513		40.6%	-	-	-

NG = No gambling in last 12 months
OG = Other gambling activities
LFU = Lost to follow-up
Yes = Any online or remote horse/dog race gambling (NZ or offshore)
No = Horse/dog race gambling but not online or remotely

Sports event gambling online/remotely in NZ or offshore (Yes) vs. NZ venue based sports event gambling (No)

			Wave 1		Wave 2			Wave 3		
Wave 1	Wave 2	Wave 3	n*	%	n*	%	% drop out	n*	%	% drop out
No	No	No	160	2.6%	28	27.4%	-	12	54.0%	-
		Yes						2	10.5%	-
		OG						8	35.5%	-
		NG						0	-	-
		LFU						6	-	21.9%
	Yes	No			7	7.2%	-	4	67.5%	-
		Yes						1	22.3%	-
		OG						1	10.3%	-
		NG						0	-	-
		LFU						1	-	14.0%
	OG	No			58	56.5%	-	6	12.0%	-
		Yes						3	5.4%	-
		OG						39	80.3%	-
		NG						1	2.3%	-
		LFU						9	-	15.5%
	NG	No			9	9.0%	-	0	-	-
		Yes						2	31.6%	-
		OG						4	68.4%	-
		NG						0	-	-
		LFU						3	-	30.8%
	LFU				57		35.7%	-	-	-
Yes	No	No	127	2.0%	6	11.2%	-	0	-	-
		Yes						4	56.7%	-
		OG						2	28.3%	-
		NG						1	15.0%	-
		LFU						0	-	-
	Yes	No			23	40.5%	-	3	15.0%	-
		Yes						9	46.7%	-
		OG						7	38.2%	-
		NG						0	-	-
		LFU						4	-	16.4%
	OG	No			27	48.3%	-	0	-	-
		Yes						2	6.5%	-
		OG						23	93.5%	-
		NG						0	-	-
		LFU						3	-	10.3%
	NG	No			0	-	-	0	-	-
		Yes						0	-	-
		OG						0	-	-
		NG						0	-	-
		LFU						0	-	-
	LFU				71		55.7%	-	-	-
OG	No	No	4702	75.2%	27	1.0%	-	4	18.9%	-
		Yes						2	11.4%	-
		OG						14	69.7%	-
		NG						0	-	-
		LFU						7	-	27.1%
	Yes	No			8	0.3%	-	0	-	-
		Yes						2	23.8%	-
		OG						6	76.2%	-
		NG						0	-	-
		LFU						0	-	-
	OG	No			2469	87.0%	-	21	1.0%	-
		Yes						11	0.5%	-
		OG						1835	88.9%	-
		NG						197	9.5%	-
		LFU						406	-	16.4%
	NG	No			334	11.8%		2	0.9%	-
		Yes						2	0.8%	-

Wave 1	Wave 2	Wave 3	Wave 1		Wave 2			Wave 3		
			n*	%	n*	%	% drop out	n*	%	% drop out
		OG						137	50.0%	-
		NG						133	48.3%	-
		LFU						60	-	17.8%
	LFU				1864		39.6%	-	-	-
NG	No	No	1261	20.2%	2	0.2%	-	0	-	
		Yes						0	-	
		OG						2	100.0%	
		NG						0	-	
		LFU						0		13.2%
	Yes	No			1	0.2%	-	0	-	-
		Yes						0	-	-
		OG						1	100.0%	-
		NG						0	-	-
		LFU						0		1.5%
	OG	No			261	34.9%	-	0	-	-
		Yes						0	-	-
		OG						128	58.9%	-
		NG						89	41.1%	-
		LFU						44	-	16.9%
	NG	No			485	64.7%	-	0	-	-
		Yes						0	-	-
		OG						97	24.1%	-
		NG						307	75.9%	-
		LFU						80	-	16.6%
	LFU				513		40.6%	-	-	-

NG = No gambling in last 12 months
OG = Other gambling activities
LFU = Lost to follow-up
Yes = Any online or remote sports event gambling (NZ or offshore)
No = Sports event gambling but not online or remotely

Offshore online/remote horse/dog race and sports gambling (Yes) vs. horse/dog race and sports gambling not offshore online/remote (No)

			Wave 1		Wave 2			Wave 3		
Wave 1	Wave 2	Wave 3	n*	%	n*	%	% drop out	n*	%	% drop out
No	No	No	802	12.8%	253	53.2%	-	130	63.4%	-
		Yes						6	3.0%	-
		OG						64	30.9%	-
		NG						6	2.7%	-
		LFU						47	-	18.7%
	Yes	No			11	2.3%	-	8	72.4%	-
		Yes						3	27.6%	-
		OG						0	-	-
		NG						0	-	-
		LFU						1	-	4.6%
	OG	No			187	39.4%	-	30	18.9%	-
		Yes						2	1.4%	-
		OG						123	77.0%	-
		NG						4	2.7%	-
		LFU						28	-	15.0%
	NG	No			24	5.1%	-	3	12.3%	-
		Yes						0	-	-
		OG						14	66.3%	-
		NG						5	21.4%	-
		LFU						3	-	10.8%
	LFU				327		40.7%	-	-	-
Yes	No	No	46	0.7%	11	42.7%	-	4	44.9%	-
		Yes						3	31.4%	-
		OG						2	23.8%	-
		NG						-	0.0%	-
		LFU						3	-	27.8%
	Yes	No			2	8.7%	-	0	-	-
		Yes						0	-	-
		OG						0	-	-
		NG						0	-	-
		LFU						2	-	100.0%
	OG	No			13	48.6%	-	1	12.0%	-
		Yes						1	10.4%	-
		OG						8	77.6%	-
		NG						0	-	-
		LFU						3	-	23.2%
	NG	No			0	-	-	0	-	-
		Yes						0	-	-
		OG						0	-	-
		NG						0	-	-
		LFU						0	-	-
	LFU				20		42.8%	-	-	-
OG	No	No	4142	66.3%	138	5.5%	-	48	42.8%	-
		Yes						0	-	-
		OG						61	55.1%	-
		NG						2	2.1%	-
		LFU						27	-	19.8%
	Yes	No			5	0.2%	-	2	53.8%	-
		Yes						1	30.4%	-
		OG						1	15.8%	-
		NG						0	-	-
		LFU						2	-	37.1%
	OG	No			2033	81.4%	-	74	4.3%	-
		Yes						1	0.1%	-
		OG						1449	84.7%	-
		NG						187	10.9%	-
		LFU						322	-	15.9%
	NG	No			319	12.8%	-	7	2.7%	-
		Yes						0	0.2%	-

Wave 1	Wave 2	Wave 3	Wave 1		Wave 2			Wave 3		
			n*	%	n*	%	% drop out	n*	%	% drop out
		OG						124	47.8%	-
		NG						128	49.4%	-
		LFU						60	-	18.7%
	LFU				1646		39.7%	-	-	-
NG	No	No	1261	20.2%	11	1.5%		4	38.9%	-
		Yes						0	-	-
		OG						4	41.3%	-
		NG						2	19.8%	-
		LFU						1	-	7.8%
	Yes	No			1	0.2%	-	0	-	-
		Yes						0	-	-
		OG						1	100.0%	-
		NG						0	-	-
		LFU						0	-	-
	OG	No			252	33.6%	-	7	3.4%	-
		Yes						0	-	-
		OG						114	54.7%	-
		NG						87	41.9%	-
		LFU						44	-	17.3%
	NG	No			485	64.7%	-	4	1.0%	-
		Yes						0	-	-
		OG						93	23.1%	-
		NG						307	75.9%	-
		LFU						80	-	16.6%
	LFU				513		40.6%	-	-	-

NG = No gambling in last 12 months
OG = Other gambling activities
LFU = Lost to follow-up
Yes = Any offshore online/remote TAB gambling
No = New Zealand Racing Board gambling but not offshore online or remotely