GAMBLING AND PROBLEM GAMBLING:

RESULTS OF THE 2011/12 NEW ZEALAND HEALTH SURVEY

FINAL REPORT

July 2015

Prepared for:

The Ministry of Health

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EXECUTIVE SUMMARY

This report presents results from an in-depth quantitative analysis of gambling and problem gambling data from the 2011/12 New Zealand Health Survey (NZHS). The 2011/12 New Zealand Health Survey gathered data through face-to-face interviews with more than 12,000 randomly selected adults aged 15 years and over throughout New Zealand. It provides information about health behaviours, lifestyles, health status, and access to healthcare. Questions on gambling and problem gambling have been included in the three most recent New Zealand Health Surveys - 2002/03, 2006/07 and 2011/12.

The overall aim of this study was to provide a comprehensive and detailed analysis of the full gambling and problem gambling dataset collected in the 2011/12 NZHS. Specifically, this report:

1. Provides population based estimates of gambling and problem gambling behaviours in relation to individuals' (adults aged 15 years or older) own gambling behaviour and the gambling behaviour of others (i.e. people affected by someone else's gambling).

2. Examines similarities and disparities in gambling and problem gambling behaviours according to major socio-demographic variables: age, gender, ethnicity, socio-economic status/deprivation, education, employment status and income.

3. Explores associations between gambling and problem gambling behaviours and potential risk/resiliency factors, including: socio-demographic factors; use of alcohol, tobacco and other drugs; level of functioning; long-term mental health conditions (depression, manic depression, anxiety), and use of health services.

4. Examines trends over time for gambling and problem gambling data where permissible (i.e. time series analysis of NZHS data from 2002/03, 2006/07 and 2011/12).

This research also aimed to compare and contrast findings from the 2011/12 NZHS with those of earlier NZHS waves (Ministry of Health, 2006, 2009) and the 2012 National Gambling Study (Abbott, Bellringer, Garrett, & Mundy-McPherson, 2014a, 2014b). It should be noted here that while there are a number of

similarities in findings between the 2011/12 NZHS and the National Gambling Study, there are some important differences that should be considered when interpreting the findings from the 2011/12 NZHS. For example, the 2011/12 wave of the NZHS found that approximately one-half of adults had participated in some form of gambling in the last 12 months while the National Gambling Study reported a past 12-month gambling participation rate of 80%. The 2011/12 NZHS found that three percent, or an estimated 112,800 adults, were experiencing some level of harm and/or negative consequences as a result of their gambling; just over one percent satisfied the PGSI past-year criteria for moderate-risk/problem gambling (1.0% - moderate-risk and 0.2% - problem) and a further two percent satisfied the criteria for low-risk gambling. These estimates are smaller than those obtained by the National Gambling Study, which estimates that 2.5% of adults are moderate-risk/problem gamblers (1.8% - moderate-risk and 0.7% - problem) and a further five percent satisfy the criteria for low-risk gambling. These differences are discussed in more detail in the summary sections of Chapter Four (*Past Year Gambling Participation*), Chapter Five (*Problematic Gambling*), Chapter Six (*Ecological Factors and Problematic Gambling)* and throughout Chapter Eight (*Discussion and Conclusions*).

Past-year gambling participation

- Approximately one-half (52%) of all adults aged 15 years and over had gambled on at least one activity in the last 12 months.

- The most popular gambling activities were Lotto and associated lottery products (45%). Less than ten percent of adults had gambled on Electronic Gaming Machines (EGM), track or sports betting, casino gambling (EGMs and/or tables), Keno, housie and 'other' in the previous year.

- Instant Kiwi was preferred by greater proportions of females than males, and greater proportions of males preferred track and sports betting.

- Lotto and track betting were more popular amongst the older age-brackets while younger age-groups preferred Instant Kiwi.

- Approximately one-third (33%) of adults had gambled on one activity in the last 12 months and three percent of adults had gambled on 'four or more' activities. Gambling on 'four or more' activities was more prevalent amongst males, younger age groups, Māori and European/Other, those who lived in urban locations, and people who had gambled on Keno, casino tables, and EGMs (casino and/or non-casino).

Problematic gambling

- Problem gambling was measured by the Problem Gambling Severity Index (PGSI).

- Approximately 43,400 (95% CI 35,100 – 51,800), or 1.2% of the adult population satisfied the criteria for moderate-risk/problem gambling (1.0% - moderate-risk and 0.2% - problem). A further 2.0% satisfied the criteria for low-risk gambling.

- Loss of control, feelings of guilt, and chasing losses were the most frequently endorsed items on the Problem Gambling Severity Index.

- Adults that satisfied the criteria for moderate-risk/problem gambling were more likely to be male, aged 25-34 or 45-54, identify as Māori or Pacific, and live in urban neighbourhoods with higher levels of deprivation.

- Gambling on 'four or more' activities was associated with an increased risk of gambling problems.

- There was an overall trend for the severity of gambling problems to increase along with rate of participation in each gambling activity, particularly for EGMs: Moderate-risk/problem gamblers were 14 times more likely to have gambled on any EGM and 13 times more likely to have gambled on non-casino EGMs than non-problem/recreational gamblers.

Ecological factors and problematic gambling

- Problematic gambling was significantly associated with use of alcohol, hazardous drinking behaviour, alcohol dependence, smoking, and use of drugs.

- Compared to people with no gambling problems, moderate-risk/problem gamblers had:

  o 1.6 times the odds of drinking alcohol;

  o 4.7 times the odds of hazardous drinking;

  o 6.3 times the odds of alcohol dependence;

  o 4.2 times the odds of being a current smoker; and,

  o 3.7 times the odds of using drugs:

    ▪ 2.7 times the odds of using cannabis;

    ▪ 6.9 times the odds of using other drugs.

- Problematic gambling was significantly associated with fair or poor self-rated health and a high/very high probability of an anxiety or depressive disorder. The odds of an anxiety or depressive disorder rose with gambling symptom severity: low-risk gamblers were twice as likely (OR 2.1) and moderate-risk/problem gamblers were nearly six times as likely (OR 5.7) as adults with no gambling problems to have an anxiety or depressive disorder.

- Moderate-risk/problem gamblers were significantly more likely to have been diagnosed by a doctor with a common mental disorder (i.e. depression, bipolar disorder or anxiety disorder).

- Adults with gambling problems exhibited greater use of health services than other adults: moderate-risk/problem gamblers were twice (OR 2.0) as likely as those with no gambling problems to have consulted a GP in the past year. However, this group were also more likely to report having unmet health needs (not being able to see a GP when they needed to):

  o Compared to those with no gambling problems, low-risk gamblers were twice as likely (OR 2.1) and moderate-risk/problem gamblers were two and a half times as likely (OR 2.6) to report unmet health needs.

o The relationship between gambling status and having unmet health needs <u>due to cost</u> was also significant. Low-risk and moderate-risk/problem gamblers were twice as likely (OR 2.1 and OR 1.9 respectively) as those with no gambling problems to report that they had not seen a GP due to the cost.

- Gambling status was significantly associated with use of other health professionals (i.e. a psychologist, counsellor or social worker): moderate-risk/problem gamblers were three and a half times more likely (OR 3.4) than those with no gambling problems to have sought help in the past 12 months.

Experiencing problems due to someone else's gambling

- Approximately 89,100 (95% CI 77,000 - 101,100), or 2.5% of adults aged 15 years and over indicated that they had been negatively impacted by someone else's gambling in the past 12 months.

- Adults that had been affected by someone else's gambling were more likely to be female, aged 25-34 years, and identify as Māori or Pacific.

- Being affected by someone else's gambling was significantly associated with an individual's own gambling status: 9.5% of people categorised as low- or moderate-risk/problem gamblers had been affected by someone else's gambling, compared with 2.9% of non-problem/recreational gamblers and 1.6% of non-gamblers.

- Non-casino EGMs (52.9%), casino EGMs (32.0%) and track or sports betting (22.1%) were the modes most associated with harm from someone else's gambling.

Changes over time – comparison of the 2002/03, 2006/07 and 2011/12 NZHS

It is important to note that when comparisons are made in this report between recent NZHS surveys (2002/03, 2006/07 and 2011/12), results have been age-standardised in accordance with World Health Organisation (WHO) age population distributions. As such, some of the results that are reported for the 2011/12 NZHS in the 'changes over time' sections throughout this report, may differ slightly to those that are

specified elsewhere in this report. For example, while 52.3% of the adult population had gambled over the past-year in the 2011/12 NZHS (as detailed above), the *age-adjusted* rate of past-year gambling in 2011/12 is 45.7% (as reported below when comparing with previous waves of the NZHS).

Involvement in gambling and activities that adults gamble on

- The overall proportion of people who had gambled on any activity has significantly ($p<0.0001$) decreased with each NZHS wave: 65.9% in 2002/03; 60.3% in 2006/07; 45.7% 2011/12.

- Significant decreases in participation across the three NZHS waves were observed for: Lotto, Instant Kiwi, non-casino EGMs, track betting, casino EGMs (NB: data for casino EGMs was only available for 2006/07 and 2011/12), sports betting, Keno and Housie.

Number of gambling activities

- The number of gambling activities that people engaged in had significantly decreased over time. There was an overall decreasing trend with people participating in fewer activities with each survey wave, for example, the proportion of people who had gambled on four or more activities had decreased: 5.9% in 2002/03; 5.2% in 2006/07; 3.0% in, 2011/12.

Problematic gambling

- **No significant** changes (based on overlapping 95% confidence intervals) were observed in the proportions of *problem* (0.4% in 2006/07 and 0.2% in 2011/12) or *moderate-risk gamblers* (1.4% in 2006/07 and 1.0% in 2011/12).

- **Significant** changes ($p<0.0001$; based on non-overlapping 95% confidence intervals) were observed in the proportions of:

  - *non-gamblers*: 39.7% in 2006/07 and 54.3% in 2011/12;

  - *non-problem/recreational gamblers*: 54.7% in 2006/07 and 42.3% in 2011/12; and,

  - *low-risk gamblers*: 3.7% in 2006/07 and 2.1% in 2011/12.

- The lack of significant changes over time in the NZHS (from 2006/07 to 2011/12) in the prevalence of moderate-risk or problem gambling is consistent with the National Gambling Study. However, the significant reduction in the proportion of low-risk gamblers (which may have been a consequence of the increased proportion of non-problem/recreational gamblers), contrasts with the National Gambling Study, which found no difference in the proportion of low-risk gamblers over time.

Conclusions

Overall, this research indicates that adult participation in gambling has decreased. However, problem gambling continues to be a significant public health issue in New Zealand, with stable proportions of the population gambling at problem and moderate-risk levels. In total, 1.2% satisfied the criteria for moderate-risk/problem gambling (1.0% - moderate-risk and 0.2% - problem) and a further 2.0% satisfied the criteria for low-risk gambling; approximately 112,800 New Zealand adults are experiencing negative impacts as a result of their own gambling. An additional 2.5%, or approximately 89,100 adults, had experienced negative impacts due to someone else's gambling in the past year.

Problematic gambling was associated with a number of co-existing issues, including hazardous drinking, smoking, drug use, and psychological distress/disorders. While people experiencing problem gambling were more likely to have accessed healthcare in the past year, they were also more likely to say that they had been unable to access such help due to financial difficulties. These findings have important implications for the delivery of assistance to those with problem gambling issues and support the need for facilitation and strong inter-agency communication and cooperation between those working in the areas of problem gambling, alcohol and drug treatment, and primary-care health services.

This report reiterates that EGMs, both in and out of casinos, are associated with the most harm from gambling and that Māori, Pacific people and those living in neighbourhoods with higher levels of deprivation are disproportionately affected by problem gambling.

1. INTRODUCTION & BACKGROUND

New Zealand's Gambling Act 2003 defines gambling as "… paying or staking consideration, directly or indirectly, on the outcome of something seeking to win money when the outcome depends wholly or partly on chance" (Parliamentary Council Office, 2003, Section 4). Research indicates that the majority of New Zealand adults participate in some form of gambling and that substantial proportions of the population are negatively impacted by their own or someone else's gambling every year (Abbott et al., 2014b; Abbott & Volberg, 1991, 2000a; Ministry of Health, 2006, 2009; Tu, 2013). Problem gambling results in significant negative social, health and economic impacts on individuals, families and communities. The Gambling Act 2003 requires a public health focus to be taken in addressing gambling harm in New Zealand (Ministry of Health, 2010a).

This report presents results from an in-depth quantitative analysis of gambling and problem gambling data from the 2011/12 New Zealand Health Survey (NZHS). The 2011/12 NZHS gathered data through face-to-face interviews with more than 12,000 randomly selected adults (aged 15 years and over) throughout New Zealand. This survey is a valuable source of information about health behaviours, lifestyles, health status, and access to healthcare. Questions on gambling and problem gambling have been included in the last three New Zealand Health Surveys - 2002/03, 2006/07 and 2011/12.

The overall aim of this study was to provide a comprehensive and detailed analysis of the full gambling and problem gambling dataset collected in the 2011/2012 NZHS. Specifically, this report:

1. Provides population based estimates of gambling and problem gambling behaviours in relation to individuals' (adults aged 15 years or older) own gambling behaviour and the gambling behaviour of others (i.e. people affected by someone else's gambling).

2. Examines similarities and disparities in gambling and problem gambling behaviours according to major socio-demographic variables: age, gender, ethnicity, socio-economic status/deprivation, education, employment status and income.

3. Explores associations between gambling and problem gambling behaviours and potential risk/resiliency factors, including: socio-demographic factors; use of alcohol, tobacco and other drugs; level of functioning; long-term mental health conditions (depression, manic depression, anxiety), and use of health services.

4. Examines trends over time for gambling and problem gambling data where permissible (i.e. time series analysis of NZHS data from 2002/03, 2006/07 and 2011/12).

This research also aimed to compare and contrast findings with those of the National Gambling Study (Abbott et al., 2014a, 2014b) and earlier waves of the New Zealand Health Survey (Ministry of Health, 2006, 2009).

The following section provides an overview of gambling in New Zealand, including the availability of gambling activities, adult participation in gambling, estimates of problem gambling and help-seeking for gambling related issues.

1.1 Availability of gambling in New Zealand

As in most westernised countries, New Zealand has seen a rapid expansion of gambling in the past few decades. Gambling is now widely available, with popular legalised activities including state-run lotteries (Lotto, Instant Kiwi, Daily Keno, Big Wednesday, Play3, Bullseye), track and sports betting (through the Totalisator Agency Board - TAB), and housie (bingo). New Zealand also has six casinos, the maximum number permitted under the Gambling Act 2003, which are located in Auckland, Hamilton, Dunedin, Christchurch and Queenstown. However, electronic gaming machines (EGMs) are the mode of gambling that underwent significant growth in the ten years prior to the Gambling Act 2003 being enacted. Chartered clubs, Returned Service Associations, sports clubs, and hotels were legally allowed to operate EGMs from 1988 onwards (Phillips, 2006) and in 1990 the Casino Control Act allowed for the introduction of casinos with EGMs and table games. Figure 1 illustrates the numbers of EGMs in New Zealand from June 1994 to September 2014 and shows that EGM numbers peaked in 2003, with 25,221 EGMs operating throughout New Zealand at that time

(Department of Internal Affairs, 2014b). The most recent data point, September 2014, reveals that the number of EGMs in New Zealand had dropped to 16,814 (Department of Internal Affairs, 2014b).

Figure 1:   *Gaming machine numbers, June 1994 to September 2014 at 3-monthly intervals* [1]
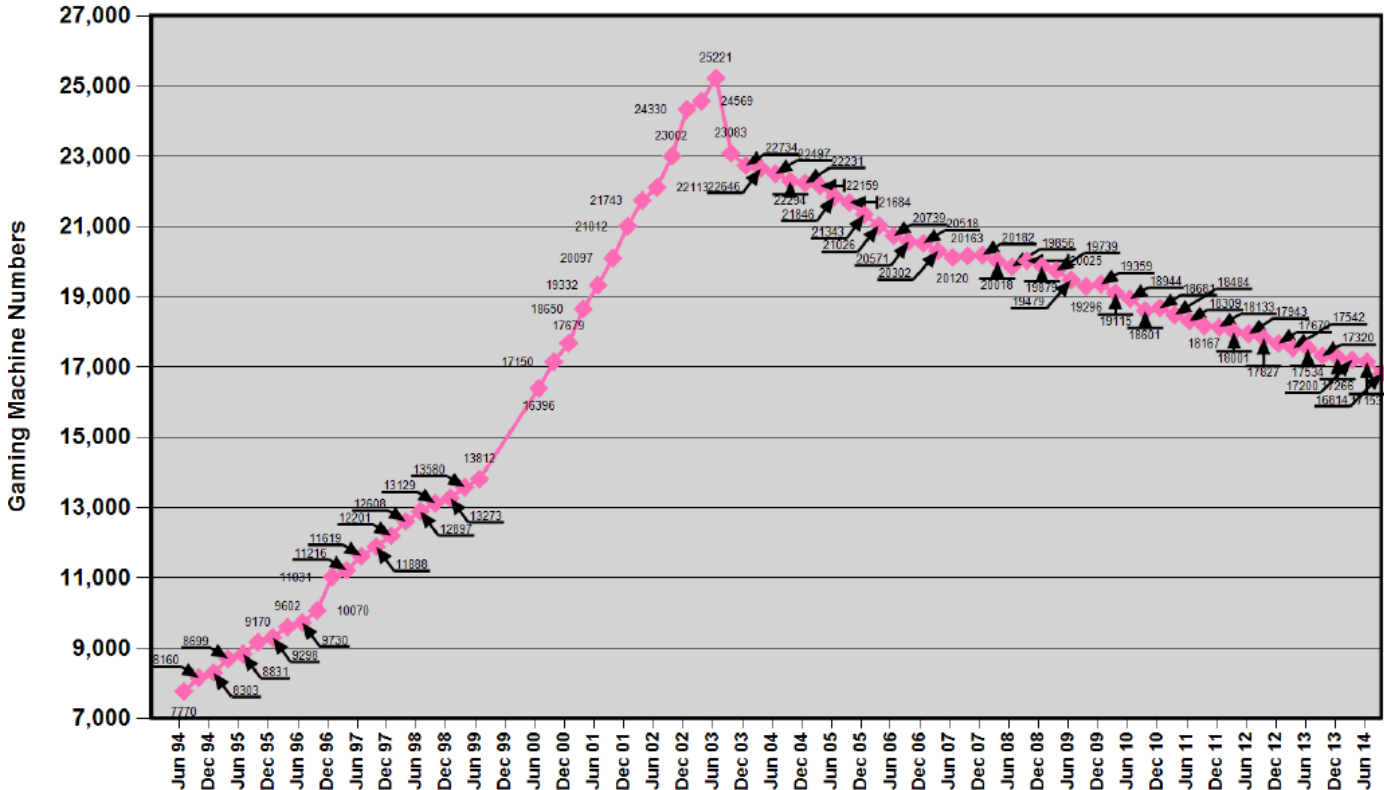
Notes:
1.   Source: Department of Internal Affairs (2014b). Report generated on 2 October 2014.

At present, gambling in New Zealand is regulated by the Gambling Act 2003 and the Racing Act 2003, which replaced the Gaming and Lotteries Act 1977, the Casino Control Act 1990, and the Racing Act 1971 (Department of Internal Affairs, 2013). The Gambling Act 2003 was introduced with a focus on the prevention and minimisation of the harm caused by gambling, including problem gambling, while also aiming to control the growth of gambling (through provisions such as limitations on the number of EGMs per venue). The Act also had the purpose of ensuring that profits from gambling benefit the community and that communities are

involved in decisions around the availability of specific gambling activities within their district. The "purpose of the Gambling Act is to:

- Control the growth of gambling

- Prevent and minimise the harm caused by gambling, including problem gambling

- Authorise some gambling and prohibit the rest

- Facilitate responsible gambling

- Ensure the integrity and fairness of games

- Limit opportunities for crime or dishonesty associated with gambling

- Ensure that money from gambling benefits the community

- Facilitate community involvement in decisions about the provision of gambling."

(Parliamentary Council Office, 2003, Section 3).

The Gambling Act 2003 also bought some consistency to the legislation around age limits for gambling activities in New Zealand. Following the introduction of the Act, the age limits for Instant Kiwi, non-casino EGMs and sports and track betting were all set at 18 years of age. An age limit of 20 years of age was set for casino gambling, including tables and EGMs.

1.2   Participation in gambling - New Zealand

Adult participation in gambling and rates of problem gambling in New Zealand can be assessed through a number of sources. One source is the gambling expenditure statistics that are collected by the Department of Internal Affairs (DIA). These statistics provide data on the amount of money spent each financial year on the four main types of gambling activity in New Zealand: Casino gambling; Non-casino EGMs; New Zealand Lotteries Commission; and TAB racing and sports betting. Figure 2 illustrates annual gambling expenditure from 1989 through to 2013, and shows that the total combined expenditure for the four modes was almost $2.1 billion dollars ($2,072 million) in the 2012/13 financial year. Non-casino EGMs were the biggest earner ($826 million), followed by casinos ($520 million), NZ Lotteries ($432 million) and the NZ Racing Board ($294

million). The Department of Internal Affairs state that while the 2013 expenditure was 0.3% more than the previous year, it actually represents a decline of almost 19% from the previous high of $2.6 billion dollars (*inflation-adjusted*) recorded in 2004. They also indicate that NZ Lotteries products are the only activities to have not seen a drop in inflation-adjusted expenditure, in fact expenditure on their products have increased 22% since 2004 (Department of Internal Affairs, 2014a).

Figure 2:   Annual gambling expenditure in New Zealand, by gambling activity type (1989/90 – 2013/14 financial years) [1]
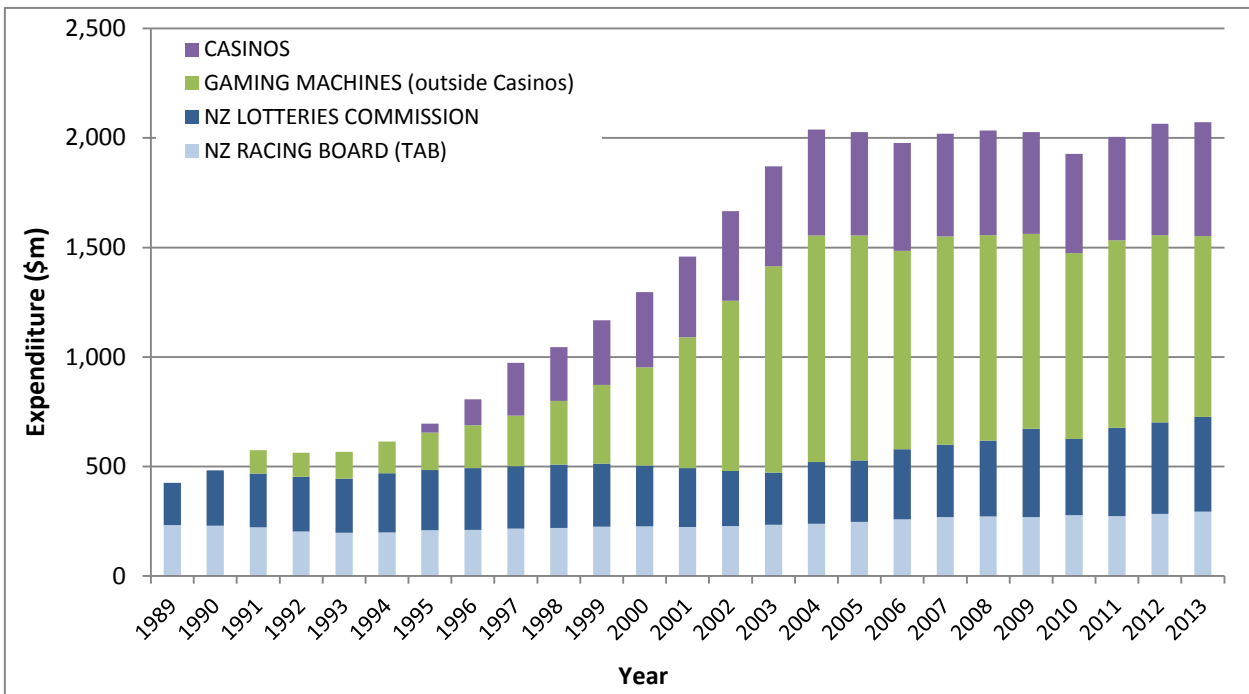
Notes:
1.   Source: Department of Internal Affairs (2014a).
2.   Expenditure is the amount lost or spent by players or the gross profit of the gaming operator. Expenditure has not been adjusted for inflation.

From 1985 through to 2005, the DIA also carried out five-yearly surveys on gambling participation in New Zealand (Department of Internal Affairs, 2007). These were complemented by two National Prevalence Surveys that were conducted in 1991 and 1999 (Abbott & Volberg, 1991, 2000a). The National Prevalence Surveys carried out comprehensive assessments of participation in gambling and problem gambling, including a standardised measure of problem gambling over two timeframes: lifetime and previous-six months. Amongst

other things, these studies found that the majority of New Zealanders participate in some form of gambling. The 1991 National Prevalence Study found that 89% of adults had gambled in the past six-months, compared with 86% in the 1999 study (Abbott & Volberg, 1991, 2000a). These rates are consistent with those observed in the 1990 and 2000 DIA surveys (Abbott et al., 2014b). The 1999 National prevalence survey found that approximately 40% of adults gambled on a weekly basis, mostly on lottery products, although approximately ten percent gambled weekly on EGMs and track betting (both of which are continuous[1] modes of gambling). Socio-demographic characteristics were found to vary according to the type of gambling, with males, Māori, and those aged 55-64, without formal educational qualifications, and with lower status occupations being more likely to regularly participate in continuous modes of gambling.

The most recent National Gambling Study, carried out in 2012, found a lifetime gambling rate of 86% for adults (aged 18 and over) and a past-year rate of 80%. The authors of this study note that the past-year gambling rate is consistent with the 2005 and 2010 studies, but lower than the rate observed in the 1990s (Abbott et al., 2014b). This study also found that the proportion of adults who gambled on a weekly basis (22%) had decreased substantially from the rates observed in the 1991 (48%) and 1999 (40%) surveys. Decreases in weekly participation were particularly noticeable amongst those who gambled on continuous forms of gambling. Lotto continued to be the most popular activity (62%), followed by raffles (47%), Instant Kiwi (33%), bets with friends and workmates (15%), non-casino EGMs (14%) and track betting (12%).

The Ministry of Health's New Zealand Health Surveys (NZHS) provide another source of information on the gambling behaviour of New Zealand adults. These nationally representative surveys aim to provide accurate information "about people's health behaviours and lifestyles, their health status and their access to healthcare." (Ministry of Health, 2012a, p.vii). Items on gambling and problem gambling have been included in the three most recent surveys: 2002/03, 2006/07 and 2011/12. The two earlier studies found a small but

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[1] Continuous modes of gambling are those activities like EGMs, casino gambling, horse and dog race betting, and sports betting, in which players can bet and collect any winnings again and again very rapidly (Department of Internal Affairs, 2014c).

significant decrease in past-year gambling rates, from 69.4% in 2002/03, to 65.3% in 2006/07 (Ministry of Health, 2006, 2009). Both surveys found that gambling participation was highest for Lotto, followed by Instant Kiwi and non-casino gaming machines. There were also significant decreases in the proportions of adults who had gambled on each of these individual activities from 2002/03 to 2006/07 (Ministry of Health, 2009).

A third national survey series has contributed to knowledge on adult gambling behaviour in New Zealand. The Health Promotion Agency (HPA) has conducted the Health and Lifestyles Survey (HLS) biannually, since 2008, to monitor the health behaviour and attitudes of New Zealand adults. Prior to the 2008 HLS, the Health Sponsorship Council (now a part of the HPA) also carried out the Gaming and Betting Activities Survey (GBAS) to "benchmark people's opinion, knowledge and behaviour relating to gambling." (Tu, 2013, p.9). The 2012 HLS found that 70.3% of adults had gambled in the previous 12 months. This was a significant decline from the past-year gambling rate of 82.4% that was observed in the 2006/07 HLS. As with the NZHS, significant decreases were seen in the proportion of adults gambling on NZ Lotteries products and non-casino gaming machines.

1.3   Problem gambling in New Zealand

Problem gambling and the associated harms have been identified as an emerging public health issue in New Zealand, with significant social, health and economic consequences. In the Gambling Act 2003, 'harm':

(a)   means harm or distress of any kind arising from, or caused or exacerbated by, a person's gambling; and
(b)   includes personal, social, or economic harm suffered—
    (i)   by the person; or
    (ii)   by the person's spouse, civil union partner, de facto partner, family, whānau, or wider community; or
    (iii) in the workplace; or
    (iv)   by society at large."   (Ministry of Health, 2010b, p.1)

Both the National Gambling Studies and the New Zealand Health Surveys have provided estimates of problem gambling amongst adults. Using the revised South Oaks Gambling Screen (SOGS-R), the 1991 National Prevalence Study estimated that 3.3% of adults aged 18 and over were current (past six months) problem or pathological gamblers (Abbott & Volberg, 1991). In 1999, 1.3% of adults were categorised as current problem

or pathological gamblers using the same screen (Abbott & Volberg, 2000a). While this represents a significant reduction in the prevalence of problem and pathological gambling from 1991 to 1999, the authors note that a reliance on two points of data and substantial methodological differences between the two studies suggest that this decrease should be treated with caution (Abbott et al., 2014a).

The most recent National Gambling Study utilised the Problem Gambling Severity Index (PGSI) to measure rates of problematic gambling. The survey found that 0.7% of adults satisfied the past-year criteria for problem gambling and were experiencing significant problems associated with their gambling. An additional 1.8% of adults were experiencing some gambling-related harms and satisfied the criteria for moderate-risk gambling. A further five percent were categorised as low-risk gamblers, meaning that they were experiencing a few gambling-related problems and were at risk of moving into moderate-risk and problem gambling categories. An increased risk of lifetime gambling problems was associated with being male, identifying as being of Māori or Pacific ethnicity, being aged 25-34, and living in a household with five or more people (Abbott et al., 2014a).

The 2002/03 NZHS included a gambling screen that was developed by the Ministry of Health and a contracted technical specialist (Ministry of Health, 2006). This screen estimated that 1.2% of the adult population (aged 15 and over) were current problem gamblers, and that 1.9% satisfied the criteria for problem and/or at-risk gambling. Regression analyses identified the following population groups as being more at risk of problem gambling than others: being aged 25-34, being of Māori or Pacific ethnicity, being employed, living alone, and having lower educational qualifications. In 2006/07, the NZHS used the PGSI to assess problem gambling. The prevalence of problem gambling amongst adults (aged 15 and over) was estimated at 0.4%, with an additional 1.3% being categorised as moderate-risk gamblers (Ministry of Health, 2009). Regression analyses were used to identify socio-demographic risk factors, with an increased risk of problem gambling being associated with the following characteristics: being aged 35-44 years, identifying as being of Māori or Pacific ethnicity, having fewer educational qualifications, and living in neighbourhoods with higher levels of deprivation (Ministry of Health, 2009).

In addition to the socio-demographic characteristics identified above, a number of factors associated with an increased risk of problematic gambling have been observed across both the National Gambling Studies and the New Zealand Health Surveys. These included participation in continuous modes of gambling, harmful alcohol use, cigarette smoking, poor health, and common mental disorders (depression and anxiety) (Abbott & Volberg, 1991, 2000a; Ministry of Health, 2006, 2009).

1.4 Summary of gambling, problem gambling and risk factors in New Zealand

Table 1 provides a summary of key findings from New Zealand based gambling and problem gambling prevalence research that has been discussed in Sections 1.2 (*Participation in gambling - New Zealand)* and 1.3 (*Problem gambling in New Zealand)*.

Table 1: Gambling and problem gambling prevalence research in New Zealand - overview of key research findings

STUDY DETAILS / SPECIFICATIONS	STUDY					
	National Gambling Study (NGS) (Abbott et al., 2014b)	**2012 Health & Lifestyles Survey** (Tu, 2013)	**2006/07 New Zealand Health Survey** (Ministry of Health, 2009)	**2002/03 New Zealand Health Survey** (Ministry of Health, 2006)	**Second National Prevalence Survey** (Abbott & Volberg, 2000a)	**First National Prevalence Survey** (Abbott & Volberg, 1991)
POPULATION	Adults ≥18	Adults ≥15	Adults ≥15	Adults ≥15	Adults ≥18	Adults ≥18
SAMPLE SIZE (N)	6,251	2,672	12,488	12,929	6,452	4,053
PROBLEM GAMBLING MEASURE	PGSI	PGSI	PGSI	Screen [1]	SOGS-R	SOGS-R
GAMBLING PARTICIPATION RATES:						
Weekly	22%	-	-	-	40%	48%
Past six-months	-	-	-	-	86%	89%
Past-year	80%	70.3%	65.3%	69%	-	-
Lifetime	86%	-	-	-	94%	95%
PREVALENCE RATES:						
At-risk	-	-	-	0.7%	-	-
Low-risk	0.5%	4.2%	-	-	-	-
Moderate-risk	1.8%	-	1.3%	-	-	-
Moderate-risk/problem	-	1.9%	-	-	-	-
Problem	0.7%	-	0.4%	1.2%	0.8%	2.1%
Probable pathological	-	-	-	-	0.5%	1.2%
MAJOR RISK FACTORS FOR <u>PROBLEM</u> GAMBLING:						
Ethnicity (Māori or Pacific)	✓	-	✓	✓	✓	✓
Sex (male)	✓	-	x	x	✓	✓
Age (years)	x	-	35-44	25-34	55-64	≤30
Lower education	✓	-	✓	✓	✓	✓
Continuous modes	✓	✓	✓	✓	✓	✓
Harmful alcohol use	✓	-	✓	✓	✓	✓
Tobacco use	✓	-	✓	✓	✓	✓
Other drug use	✓	-	-	-	-	-
Psychological distress	✓	-	✓	✓	✓	✓
Poor health	✓	-	✓	✓	✓	✓
Higher deprivation	✓	-	✓	x	✓	✓

Notes:
1. The 2002/03 NZHS used an un-validated screen based on the SOGS, the Lie/Bet screen and DSM-IV criteria for problem gambling.

1.5   Help-seeking for gambling related problems in New Zealand

The Ministry of Health funds and coordinates a range of problem gambling services under the Gambling Act 2003. This includes problem gambling intervention services that provide psychosocial support and clinical interventions (counselling) for people experiencing harm from gambling. These services acknowledge the impact of gambling on individuals, their family/whānau and affected others. A combination of interventions are purchased by the Ministry and include the following services: helpline and information; brief intervention; full intervention; facilitation; and, follow-up (Ministry of Health, 2008).

Client data is collected by intervention services and the Ministry of Health for each financial year and enables the monitoring and reporting of intervention data. Collected information includes the client status (new or existing), client type (family member/affected other or gambler) and the primary gambling mode. Figure 3 illustrates the total number of clients assisted by problem gambling intervention services from 2006/07 through to 2012/13. Client numbers peaked in 2009/10, with a total of 13,244 clients (10,498 new clients and 2,746 existing clients[2]) being seen by problem gambling intervention services throughout New Zealand. This compares with a total of 12,439 clients in 2012/13 (9,264 new clients and 3,175 existing clients).

In 2012/13, 44.3% of all clients were family members/affected others and 55.7% were gamblers. Slightly more females (53.3%) than males (46.7%) accessed services and NZ European/Other made up 41.0% of clients, Māori 34.7%, Pacific 18.4% and Asian 5.9%.

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[2] Existing clients have been defined as clients who have accessed a service in a previous year.

Figure 3: *Total clients assisted in New Zealand for problem gambling, all client types (2006/07 to 2012/13 financial years)* [1]
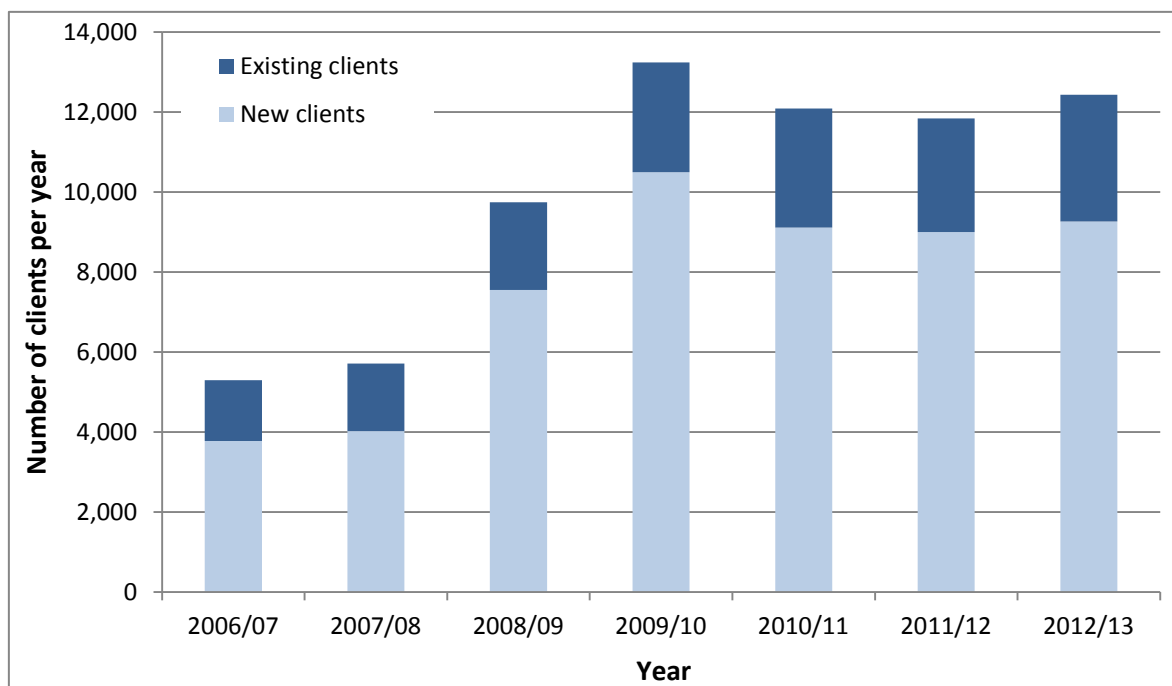
Notes:
1. Source: Ministry of Health (2014).
    a. Intervention client data represents the number of clients who have received problem gambling treatment services and who have identified to the service provider a primary problem gambling mode causing them harm.
    b. Direct comparisons between the July 2004–June 2008 and July 2008-present data should consider the following limitations:
        i.   New service specifications for problem gambling intervention service providers were implemented from January 2008.
        ii. Equivalent intervention services provided by the Gambling Helpline have been included in the data since November 2008.
    c. 'Existing clients' are clients who have accessed a service in a previous year.

Figure 4 illustrates the primary gambling mode for clients attending problem gambling intervention services from 2004/05 to 2012/13. Throughout this period, the majority of clients cited non-casino EGMs as the primary gambling mode. This corresponds with research identifying participation in continuous modes of gambling, such as EGMs, with an increased risk of problem gambling (Abbott et al., 2014a; Abbott & Volberg, 2000b; Adams et al., 2004; Health Sponsorship Council, 2012; Orford, 2011; Productivity Commission, 2010; Rossen et al., 2013; Tu, 2013). It is interesting to note that there was a rise in the proportion of clients that nominated NZ Lotteries Commission products from 2006/07 to 2009/10, and that from 2009/10 onwards, this

proportion remained relatively stable. This trend corresponds with the increased expenditure for NZ Lotteries

Commission products that was reported earlier (see Figure 2).

Figure 4: ***Primary gambling mode for total clients assisted in New Zealand for problem gambling, all client types (2006/07 to 2012/13 financial years)*** [1]
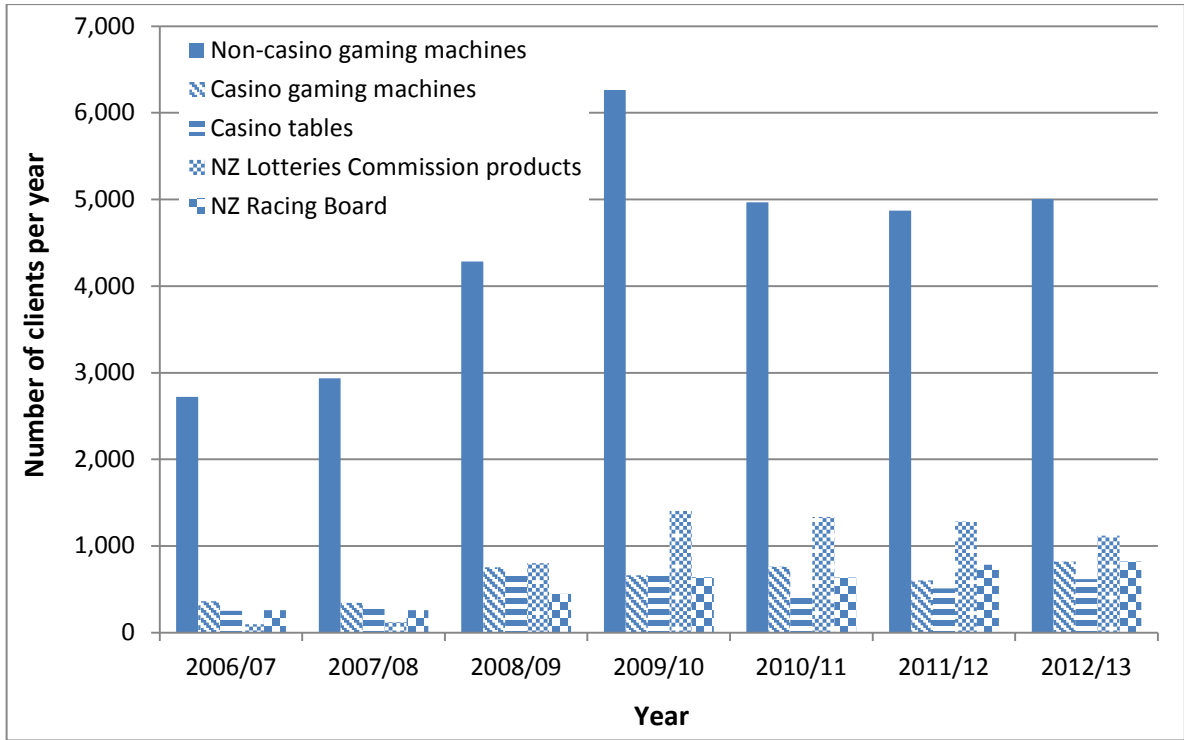
Notes:
1. Source: Ministry of Health (2014).
    a. The intervention client data represents the number of clients who have received problem gambling treatment services and who have identified to the service provider a primary problem gambling mode causing them harm.
    b. Gambling modes with lower frequencies ('Cards', 'Housie' and 'Other') have not been included in this figure.

The following chapter provides background information on the NZHS and an overview of the analysis

undertaken to enable the reporting of gambling and problem gambling data from the 2011/12 NZHS.

2. DATA SOURCES AND METHODS

The following section provides a brief overview of the NZHS, including sampling and data collection, and guides to assist with interpretation of the results and various definitions that have been used throughout the report. In-depth reports on the 2011/12 NZHS design and methodology are available online (see Ministry of Health, 2011, 2012b, 2013).

2.1   2011/12 New Zealand Health Survey

The NZHS is a national health survey that is conducted regularly by the Ministry of Health to gather information on a wide range of topics that relate to the health and wellbeing of New Zealand's population. It is a valuable source of information about health behaviours, lifestyles, health status, and access to healthcare.   The information gained via the Survey is used to monitor population health and provide supporting evidence for health policy and strategy development (Ministry of Health, 2011). In 2011/12, the NZHS collected data on the following nine information domains:

1. Health status;
2. Long-term health conditions;
3. Behaviours and risk factors;
4. Nutrition;
5. Mental health;
6. Oral health;
7. Health service utilisation;
8. Patient experience; and,
9. Socio-demographics.

The NZHS includes a set of core questions for each of these nine information domains. The core questions make up around half of all the questions in the NZHS and remain the same for each wave of the survey. The NZHS also includes a set of module questions that can enquire about a specified topic in more depth and may

change with each survey of the wave. The modules cover the nine information domains listed above and include the following six topics for domain three, 'Behaviours and risk factors':

    i.   Physical activity;

    ii.   Tobacco use;

    iii.   Alcohol consumption;

    iv.   Drug use;

    v.   <u>Problem gambling</u>; and,

    vi.   Sexual and reproductive health.

(Ministry of Health, 2013)

Questions on gambling and problem gambling have been included in the last three New Zealand Health Surveys: 2002/03, 2006/07 and 2011/12. Individual reports on gambling and problem gambling have been produced for the 2002/03 (Ministry of Health, 2006) and 2006/07 NZHS (Ministry of Health, 2009), and a report was produced in 2012 based on an analysis of preliminary gambling data for the 2011/12 NZHS (Ministry of Health, 2012c).

2.1.1   Sampling and data collection

The 2011/12 NZHS gathered data through face-to-face interviews with 12,370 randomly selected adults (aged 15 years and over) and 4,478 children (aged 0-14 years)[3] throughout New Zealand. The target population was the usually resident population of New Zealand, which includes adults who are living in permanent dwellings, student accommodation, and aged-care facilities. It should be noted that the sample did not include people who were living in institutions such as long-term hospital care (i.e. hospital and dementia-level services in aged-care facilities), prisons, the homeless, short-term visitors, and tourists (Ministry of Health, 2012b).

The 2011/12 NZHS used a multi-stage, stratified, probability-proportional-to-size (PPS) sampling design which achieved a response rate of 79% for adults and 85% for children. Participants were selected from an area-

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[3] NB: Data relating to children in the main study are described in this report.

based sample and then a list-based electoral roll sample. This dual frame approach aimed to increase sample sizes for Māori, Pacific and Asian ethnic groups. The sampling frame was designed to provide a sample that was nationally representative of New Zealand's usually resident population. Further details on the sample design can be found in the Methodology report (Ministry of Health, 2012b).

Interviews were carried out with respondents in their own home and data was collected from 1 July 2011 to 30 June 2012. Interviews were completed by trained surveyors from CBG Health Research Ltd, who used computer assisted personal interview (CAPI) software and typed responses directly into a laptop computer (Ministry of Health, 2012b).

2.1.2   Interpretation of results

This section provides guidance on how to interpret the results presented in this report and an overview of the statistical methods that were employed in analysing the 2011/12 NZHS gambling and problem gambling data.

2.1.2.1   95% confidence intervals and statistical significance

The results in this report are frequently provided in the form of prevalence estimates (i.e. weighted percentages - '%') and 95% confidence intervals ('95% CI'). 95% confidence intervals provide an indication of the accuracy of a prevalence estimate by providing a range in which we are relatively confident that the true value lies (i.e. the 'true' value for the population lies within this range 95% of the time). A wide confidence interval is indicative of more uncertainty than a narrow interval. In general, when confidence intervals overlap for different groups (e.g. for different age-brackets) it is unlikely, although still possible, that a statistically significant difference exists.

2.1.2.2   Logistic regressions and odds ratios

Logistic regression models were used to investigate associations and confirm statistical significance between gambling and a number of key items. Where applicable, these analyses controlled for demographic variables

(gender, age-group, ethnicity, deprivation, geography) that may confound or influence the association. Any significant differences have been reported in the text and referred to as 'significant' throughout this report. Statistical significance is measured at the 5% significance level (i.e. p-value of less than 0.05). A number of results are also reported as odds ratios. In this report, odds ratios provide a guide as to how likely different groups (e.g. males and females) are to experience an issue (e.g. problem gambling). A reference group is assigned with an odds ratio of one, and the odds ratio for the other groups indicates if they are more or less likely to have this issue. Odds ratios of more than one indicate a greater likelihood and odds ratios of less than one indicate a lesser likelihood.

2.1.2.3 Population estimates

Population estimates (e.g. 1,850,000 adults) have been presented for some results. These estimates reflect the number of people affected by a certain issue in the total adult population of New Zealand. These estimates relate to the usually resident population of New Zealand (as defined previously) and were calculated using New Zealand 2006 Census data.

2.1.2.4 Age standardisation

This report presents unadjusted rates for prevalence estimates of age, gender, neighbourhood deprivation and geographic location. However, age is an important determinant of health status, so populations with different age structures (e.g. Pacific and European/Other) may have different rates due to age differences. To adjust for the effects of any age differences, percentages and 95% confidence intervals have been age-standardised in accordance with World Health Organisation (WHO) age population distributions (Ahmad et al., 2001). Age standardisation has been carried out in relation to ethnicity throughout the report and for analyses relating to changes over time (i.e. comparison of results from the 2002/03, 2006/07 and 2011/12 NZHS). As such, some of the 2011/12 NZHS results that are reported in the 'changes over time' sections, may differ slightly to those that are specified elsewhere in this report. For example, while it is reported that 52.3% of the adult population had

gambled over the past-year in 2011/12, the *age-adjusted* rate for past-year gambling in 2011/12 that is reported when comparing trends over time is 45.7%.

2.1.2.5 Weighting

All of the results presented in this report were subject to statistical weighting to ensure that they are representative of the total adult population aged 15 years and over: "The NZHS uses the calibrated weighting method to:

- reflect the probabilities of selection of each respondent

- make use of external population benchmarks (typically obtained from a population Census) to correct for any discrepancies between the sample and the population benchmarks. This improves the precision of estimates and reduces bias due to non-response."

(Ministry of Health, 2012b, p.13)

A comprehensive description of the weighting procedures developed for use with the NZHS is available in the Methodology report (Ministry of Health, 2012b).

2.1.2.6 Small numbers

In accordance with the requirements of Statistics New Zealand Confidentialised Unit Record File (CURF) process, results with denominators/cell-sizes of '30 or less' have been supressed throughout this report. This has been signified by the following entries in results tables: '<30' in the column titled 'n', and '-' in the column titled '% (95%CI)'.

2.1.3 Definitions

The following section provides information on the measurements and definitions employed for ethnicity, neighbourhood deprivation, gender and problem gambling.

2.1.3.1 Ethnicity

As with the 2006/07 NZHS gambling report (Ministry of Health, 2009), this report uses total ethnic reporting to define ethnicity. This means that respondents are counted in each of the ethnic groups that are applicable to them; respondents who identify with more than one ethnic grouping are included in each of the relevant groups. As people can appear in more than one ethnic group it is inappropriate to compare these ethnic-specific proportions as mutually exclusive categories.

2.1.3.2 Neighbourhood deprivation (NZDep2006 quintile)

Neighbourhood deprivation refers to the New Zealand Index of Deprivation 2006 (NZDep2006). The NZDep2006 is a commonly used measure of socioeconomic deprivation for each neighbourhood. It is calculated using the following 2006 Census variables: income, benefit receipt, access to transport (car), household crowding, home ownership, employment status, qualifications, support (sole-parent families) and access to a telephone (Salmond, Crampton, & Atkinson, 2007). Results for NZDep2006 are presented in quintiles (quintile one to quintile five) for this report. Quintile 1 represents the 20% of neighbourhoods with the lowest levels of deprivation (i.e. the least deprived neighbourhoods) and quintile 5 represents the 20% of neighbourhoods with the highest levels of deprivation (i.e. the most deprived neighbourhoods) (Ministry of Health, 2012b).

2.1.3.3 Gender

All respondents in the 2011/12 NZHS were asked "Are you male or female?" For the sake of consistency with previous NZHS gambling reports, results relating to this item have been presented under the title of 'gender'. However, the author of this report wishes to acknowledge that this question is more suitable for establishing the sex of a respondent, which is defined by biological and physical characteristics that define men and women, rather than gender, which is a socially constructed category that reflects roles, behaviours and attributes (Statistics New Zealand, 2014; World Health Organisation, 2014).

2.1.3.4   Measuring problem gambling

The Problem Gambling Severity Index (PGSI) is a standardised measure of problem gambling (Ferris & Wynne, 2001) that was included in both the 2006/07 and 2011/12 waves of the NZHS. The PGSI is a nine-item screen that has been validated in New Zealand for use with males, females, Māori, Pacific, Asian and European populations (Devlin & Walton, 2012). It enquires about the following aspects of gambling behaviour over the last 12 months: loss of control; feelings of guilt; chasing losses; problem recognition; criticism; negative effects on health; motivation; financial problems; and, borrowing. A final score is calculated and can range from zero through to a maximum of 27, with higher scores being indicative of a greater risk of problematic gambling. Table 2 outlines the four categories of gambling that people can be grouped under according to PGSI scores.

Table 2:   PGSI scores and categorisation

PGSI SCORE	PGSI CATEGORISATION	DEFINING CHARACTERISITCS
0	Non-problematic / recreational gambling	Gambling with no associated problems or negative impacts
1 or 2	Low-risk gambling	Low level of problems with few or no identified negative consequences
3 to 7	Moderate-risk gambling	Moderate level of problems leading to some negative consequences
8 or more	Problem gambling	Problem gambling with negative consequences and a possible loss of control

2.2   Analysis of gambling and problem gambling data from the 2011/12 New Zealand Health Survey

This report provides a comprehensive analysis of the 2011/12 NZHS gambling and problem gambling data. NZHS datasets were obtained from Statistics New Zealand following completion of the Confidentialised Unit Record File (CURF) process. Following data extraction, the analysis consisted of three stages which can be summarised as:

1. *Descriptive data:* This stage involved the completion of in-depth descriptive analyses for each of the gambling and problem gambling questions from the NZHS 2011/12 survey. Results have been reported

as overall estimates for each item and broken down by major socio-demographic measures[4]: age, gender, ethnicity, socio-economic status/deprivation, and geography (living in an urban/rural location). The resulting statistics include prevalence estimates (i.e. estimated numbers, weighted percentages and 95% confidence intervals).

2. *Exploration of correlates:* This second stage of analysis employed logistic regression models to investigate associations between PGSI gambling status (i.e. non-gambler, non-problem/recreational, low-risk, moderate-risk, or problem gambler), major demographic measures, and potential risk/resiliency factors: socio-demographic variables; other dangerous consumptions; health and gambling (self-rated health, psychological distress and diagnosis of a common mental health condition); and use of health services. Prevalence estimates (i.e. weighted percentages and 95% confidence intervals) have been reported alongside measures of statistical significance (p-values and odds ratios).

3. *Time-series trends*: Finally, analysis of trends over time have been carried out on gambling related items that are comparable across the three NZHS waves (2002/03, 2006/07 and 2011/12). Results have been reported as overall estimates for each item and include prevalence estimates (i.e. weighted percentages and 95% confidence intervals) and measures of statistical significance (p-values and odds ratios).

Statistical analyses were carried out using SAS (SAS Institute Inc., 2011) and STATA software. NZHS survey weights were used to account for survey design and to ensure that all estimates are representative of New Zealand's total resident adult population.

Figure 5 provides a diagrammatic overview of key topic areas and variables from the NZHS that were analysed in relation to gambling and problem gambling for this report. These variables were identified through

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[4] Results for some items have small cell-sizes/numbers (i.e. ≤30). In accordance with the requirements of the CURF, results with cell-sizes of ≤30 have been supressed throughout this report.

consultation with the expert advisory group that was convened for this project. Members of the group included representatives from the Ministry of Health, Department of Internal Affairs, University of Auckland, Problem Gambling Foundation of New Zealand and the Auckland University of Technology's National Gambling Study team. The advisory group provided expertise and guidance on content (gambling and problem gambling research and intervention), analysis of population-based statistical data, and included Māori, Pacific and Asian representation.

Figure 5: ***Analysis of NZHS gambling and problem gambling data – key variables***
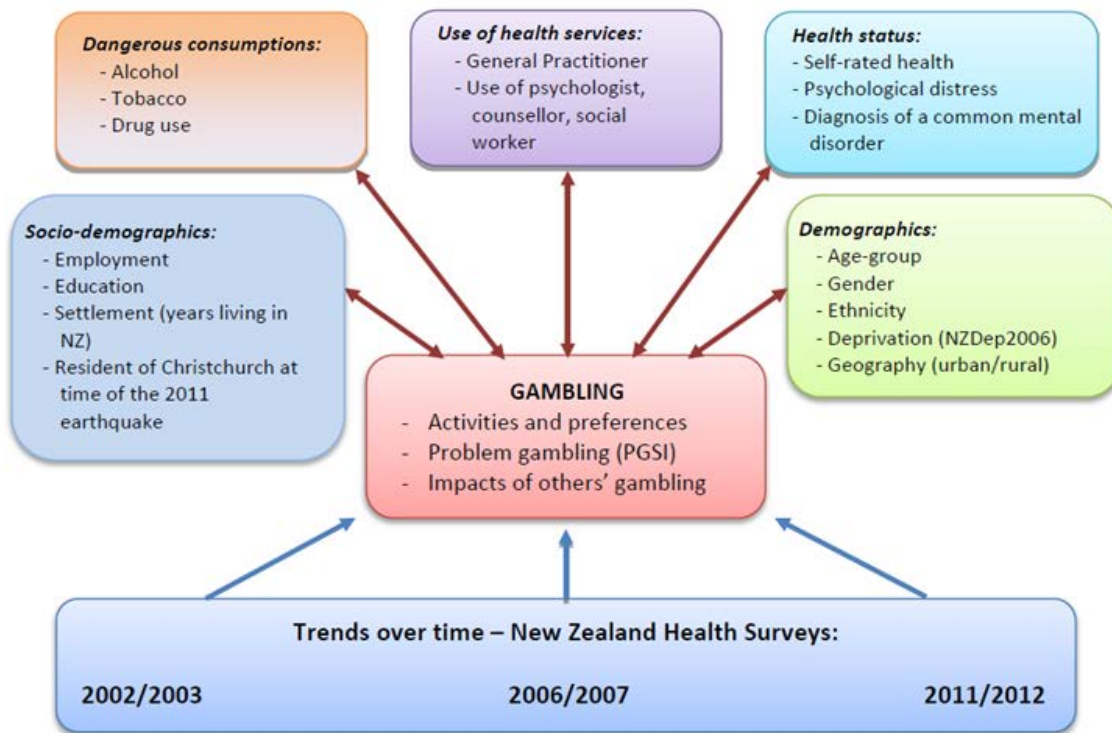
3. RESULTS

The following chapters (Chapter 4 to Chapter 7) present results from the analysis of gambling items included in the 2011/12 NZHS. These results provide data on the impacts of gambling and problem gambling on adult New Zealanders and include an examination of changes over time (based on data from the 2002/03, 2006/07 and 2011/12 Health Surveys). Results are reported under the following headings:

- Past year gambling participation (Chapter 4);

- Problematic gambling (Chapter 5);

- Ecological factors and problematic gambling (Chapter 6); and,

- Experiencing problems due to someone else's gambling (Chapter 7).

4. RESULTS: PAST YEAR GAMBLING PARTICIPATION

The following section outlines results that relate to the level of involvement in gambling that was reported by adults aged 15 and over in New Zealand. Results in this section have been reported under the following topic headings: Involvement in gambling; Activities that adults gamble on; Number of gambling activities; and, Preferred gambling activity.

4.1 Involvement in gambling

Approximately half (52.3%) of all adults aged 15 years and over had gambled on at least one activity in the last 12 months. This represents approximately 1,850,000 adults in the New Zealand population. Table 3 shows the distribution of gambling in the last year by demographic characteristics.

A significant association was observed between age-group and gambling status ($p<0.0001$): 32.8% of those aged 15-24 had gambled in the past year, compared with more than 50% in all other age-groups (see Figure 6).

Ethnicity was significantly associated with gambling status ($p<0.0001$); approximately one-half of Māori (54.1%), Pacific (49.1%) and European/Other (52.7%) had gambled in the past 12 months compared with around one-third of Asian people (37.1%). No significant interaction between ethnicity and gender was observed for past year gambling.

No significant differences in past year gambling status were observed in relation to gender, level of neighbourhood deprivation, or geography (urban/rural).

Table 3: *Past year participation in gambling by demographics, total population aged 15 years and over (unadjusted prevalence; N=12,596)* [1]

		GAMBLED IN LAST 12 MONTHS		p-value
		n	% (95% CI)	
Total		6,549	52.3 (50.9 - 53.7)	-
By Gender	Male	2,762	53.9 (52.1 - 55.8)	0.79
	Female	3,787	50.7 (49.0 - 52.4)	
By Age-group	15 - 24	473	32.8 (29.8 - 35.7)	<0.0001
	25 - 34	984	54.0 (50.8 - 57.1)	
	35 - 44	1,292	56.7 (54.0 - 59.5)	
	45 - 54	1,254	61.1 (58.2 - 63.9)	
	55 - 64	1,176	59.2 (56.3 - 62.1)	
	65+	1,370	52.3 (49.7 - 54.9)	
By Ethnicity [2]	Māori	1,408	54.1 (51.4 - 56.8)	<0.0001
	Pacific	419	49.1 (43.8 - 52.3)	
	Asian	342	37.1 (33.1 - 41.0)	
	European/Other	5,296	52.7 (51.1 - 54.3)	
By Neighbourhood Deprivation (NZDep2006)	1 (least deprived)	1,089	54.1 (50.8 - 57.5)	0.88
	2	1,027	53.6 (50.2 - 57.0)	
	3	1,327	53.8 (50.3 - 57.3)	
	4	1,413	51.6 (48.7 - 54.5)	
	5 (most deprived)	1,693	47.9 (45.2 - 50.6)	
By Geography	Rural	637	53.5 (48.8 - 58.2)	0.15
	Urban	5,891	52.1 (50.7 - 53.6)	

Notes:

1. Source: 2011/12 New Zealand Health Survey.
2. Respondents are counted in each of the ethnic groups that are applicable to them; respondents who identify with more than one ethnic grouping are included in each of the relevant groups. As such, it is inappropriate to compare these ethnic-specific proportions as mutually exclusive categories. Percentages and 95% confidence intervals have been age-standardised in accordance with World Health Organisation (WHO) age population distributions (Ahmad et al., 2001).

Figure 6 illustrates the association between age-group and gambling status (p<0.0001). No significant gender differences were observed for past-year gambling by age-group.

Figure 6: *Gambling in the last 12 months, by age group and gender, total population aged 15 years and over (unadjusted prevalence; N=12,596) [1]*
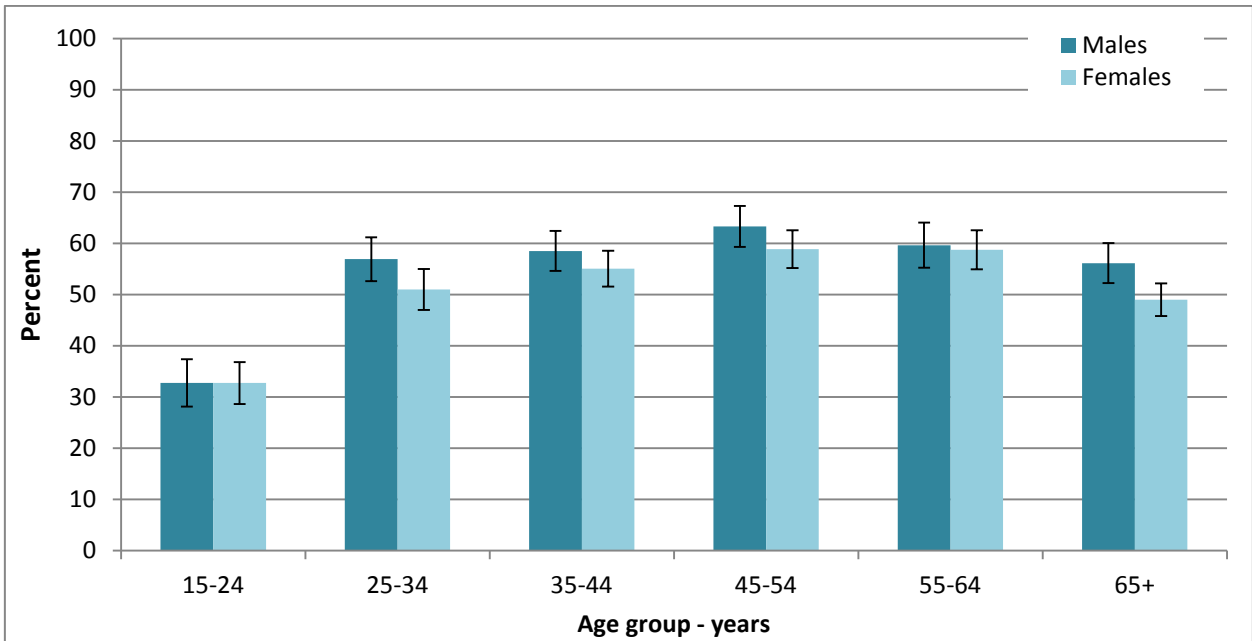
Notes:
1. Source: 2011/12 New Zealand Health Survey. Error bars are indicative of 95% confidence intervals.

4.2 Activities that adults gamble on

New Zealand Lotteries' products were the most popular gambling activities amongst New Zealand adults. In the past year, nearly half (45.2%) of all respondents had gambled on Lotto products (including 'Strike', 'Powerball' and 'Big Wednesday') and just over one-tenth (13.6%) had gambled on Instant Kiwi or other scratch tickets. Less than ten percent of adults had gambled on EGMs (casino and/or non-casino), track or sports betting, casino gambling (EGMs and/or tables), Keno, housie and 'other' in the previous year. Table 4 provides prevalence estimates for past-year participation in specific gambling activities for total adults and past-year gamblers.

Table 4: *Past year participation in specific types of gambling activities, total population aged 15 years and over (unadjusted prevalence; N=12,596)* [1]

GAMBLING ACTIVITY [2]	n	PAST-YEAR PARTICIPATION		
		Prevalence for total adults % (95% CI)	Prevalence for past-year gamblers % (95% CI)	Estimated number of people [3] (95% CI)
Any gambling activity	**6,549**	**52.3 (50.9 - 53.7)**	**100.0**	**1,846,300 (1,797,600 - 1,895,000)**
Lotto only	3,428	27.0 (25.9 - 28.1)	51.7 (49.9 - 53.4)	954,300 (914,500 - 994,200)
Any non-Lotto gambling activity	3,121	25.3 (24.1 - 26.4)	48.3 (46.6 - 50.1)	892,000 (851,200 - 932,800)
Any gaming machine (casino or non-casino)	1,157	9.1 (8.4 - 9.8)	17.3 (16.0 - 18.6)	319,900 (295,200 - 344,700)
Any casino gambling (tables or gaming machines)	601	5.4 (4.8 - 5.9)	10.3 (9.3 - 11.3)	190,300 (170,700 - 209,800)
Lotto (including 'Strike', 'Powerball' and 'Big Wednesday')	5,693	45.2 (43.8 - 46.7)	86.5 (85.3 - 87.7)	1,597,600 (1,547,200 - 1,648,000)
Instant Kiwi or other scratch tickets	1,677	13.6 (12.7 - 14.5)	26.0 (24.4 - 27.6)	480,100 (446,900 - 513,200)
Non-casino gaming machines	803	6.1 (5.5 - 6.7)	11.6 (10.5 - 12.7)	215,000 (194,100 - 235,800)
Track betting	746	6.1 (5.5 - 6.6)	11.6 (10.5 - 12.6)	213,700 (192,800 - 234,600)
Casino gaming machines	499	4.2 (3.7 - 4.7)	8.0 (7.1 - 8.9)	148,000 (131,500 - 164,500)
Sports betting	278	2.6 (2.2 - 3.1)	5.1 (4.3 - 5.8)	93,400 (78,600 - 108,200)
Casino tables	178	2.0 (1.6 - 2.3)	3.7 (3.1 - 4.4)	69,200 (56,100 - 82,200)
Other form of gambling (including Internet-based gambling)	161	1.7 (1.3 - 2.0)	3.2 (2.5 - 3.9)	59,300 (46,300 - 72,300)
Keno (not in a casino)	149	0.9 (0.7 - 1.2)	1.8 (1.4 - 2.2)	33,200 (25,600 - 40,800)
Housie	158	0.9 (0.7 - 1.1)	1.6 (1.3 - 2.0)	30,300 (23,400 - 37,200)

Notes:
1. Source: 2011/12 New Zealand Health Survey.
2. Participants could choose more than one activity / response option.
3. Estimated number of people has been calculated using New Zealand 2006 Census data.

4.2.1 Activities by demographics

The following section provides results for participation in specific gambling activities by demographic characteristics. A detailed breakdown of these results can be found in Table 19 (see Appendix B) while key results are highlighted in the following sections.

4.2.1.1 By gender

As shown in Figure 7, significant differences were observed between male and female participation for a number of gambling activities (significant gender difference have been denoted by '*' in Figure 7). Males were significantly more likely than females to have gambled on the following modes in the last 12 months: Lotto (p=0.0005), track betting (p<0.0001), sports betting (p<0.0001), casino tables (p=0.0001) and 'other' (p<0.0001). Instant kiwi (or other scratch tickets) (p<0.0001) and housie (p=0.009) were significantly more popular amongst females than males. See Table 19 (Appendix B) for further details.

Figure 7: Gambling activities in the last 12 months, by gender, total population aged 15 years and over (unadjusted prevalence; N=12,596) [1]
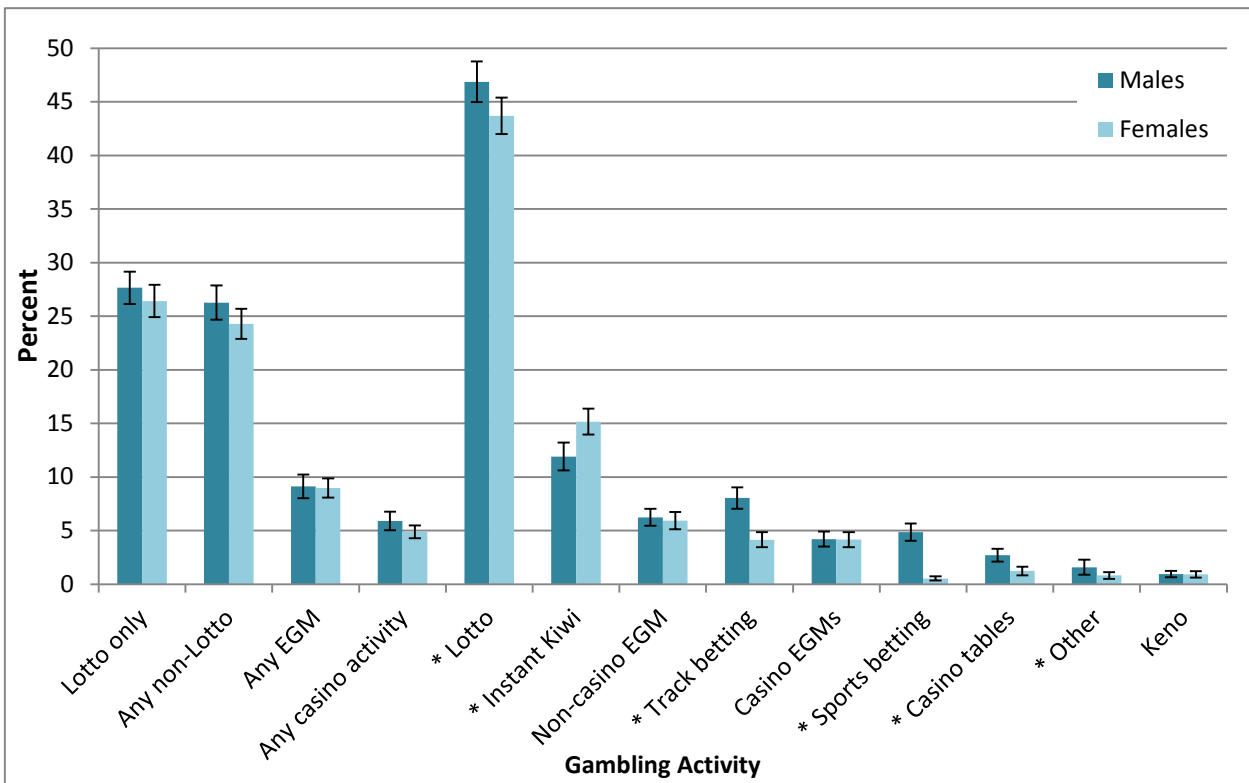
Notes:
1. Source: 2011/12 New Zealand Health Survey. Error bars are indicative of 95% confidence intervals.

4.2.1.2 By age-group

As shown earlier in Figure 6, there was a significant interaction between past-year gambling status (i.e. gambler / non-gambler) and age-group. The association between age-group was investigated in relation to individual

gambling activities, with significant interactions being observed for the following modes of gambling: Lotto only (p<0.0001); any non-Lotto (p<0.0001); any EGM (p=0.0001); any casino activity (p<0.0001); Lotto (p<0.0001); Instant Kiwi (p<0.0001); non-casino EGMs (p=0.002), casino EGMs (p=0.0079), track betting (p<0.0001); sports betting (p<0.0001); and, casino tables (p<0.0001).

A few trends were observed in relation to age-group and gambling activities, however, they should be treated with caution as the differences were not always large and/or some of the confidence intervals overlapped. Participation in the following activities peaked with adults aged 25-34: any non-Lotto, any EGM, any casino activity (Figure 8), Instant Kiwi (for males but not females - see Figure 9), sports betting and casino tables. Three activities were particularly popular with those aged 45-54: Lotto only; Lotto (Figure 10); and, track betting. Further details can be found in Table 19, Appendix B.

Figure 8:   *Gambling on any casino activity (EGMs or tables) in the last 12 months, by age group and gender, total population aged 15 years and over (unadjusted prevalence; N=12,596)* [1]
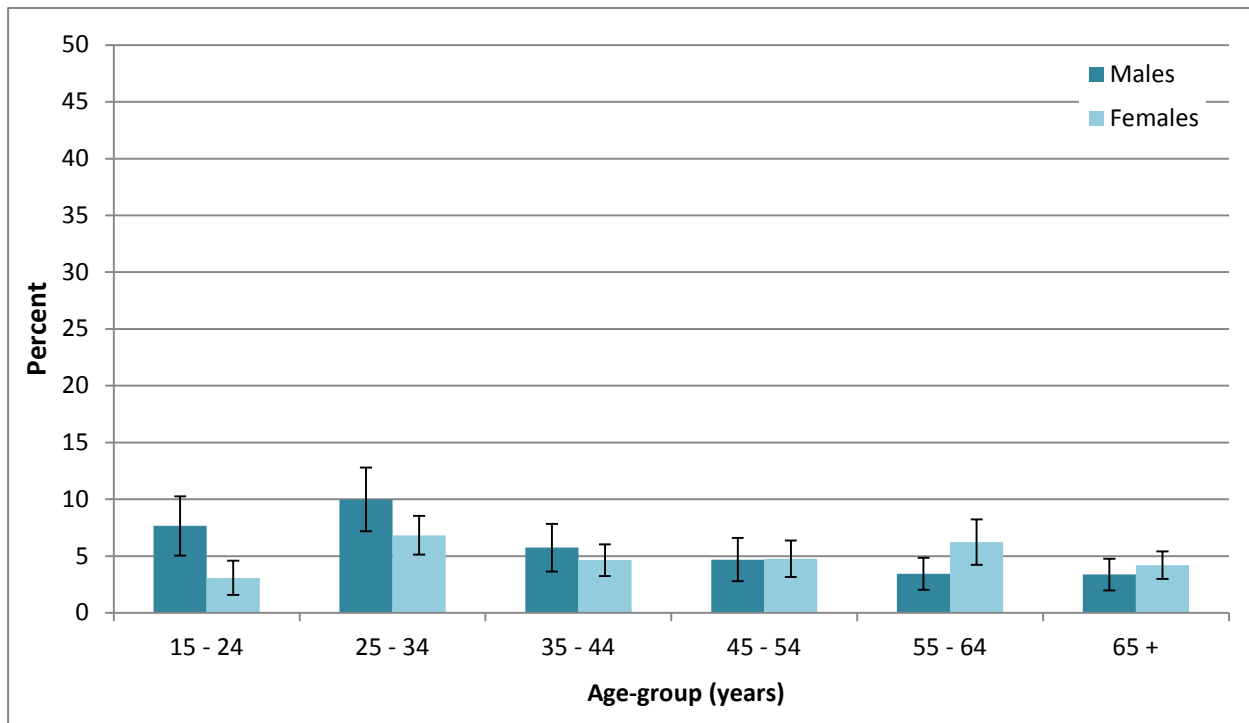
Notes:
1.   Source: 2011/12 New Zealand Health Survey. Error bars are indicative of 95% confidence intervals.

Figure 9: *Gambling on Instant Kiwi (or other scratch tickets) in the last 12 months, by age group and gender, total population aged 15 years and over (unadjusted prevalence; N=12,596)* [1]
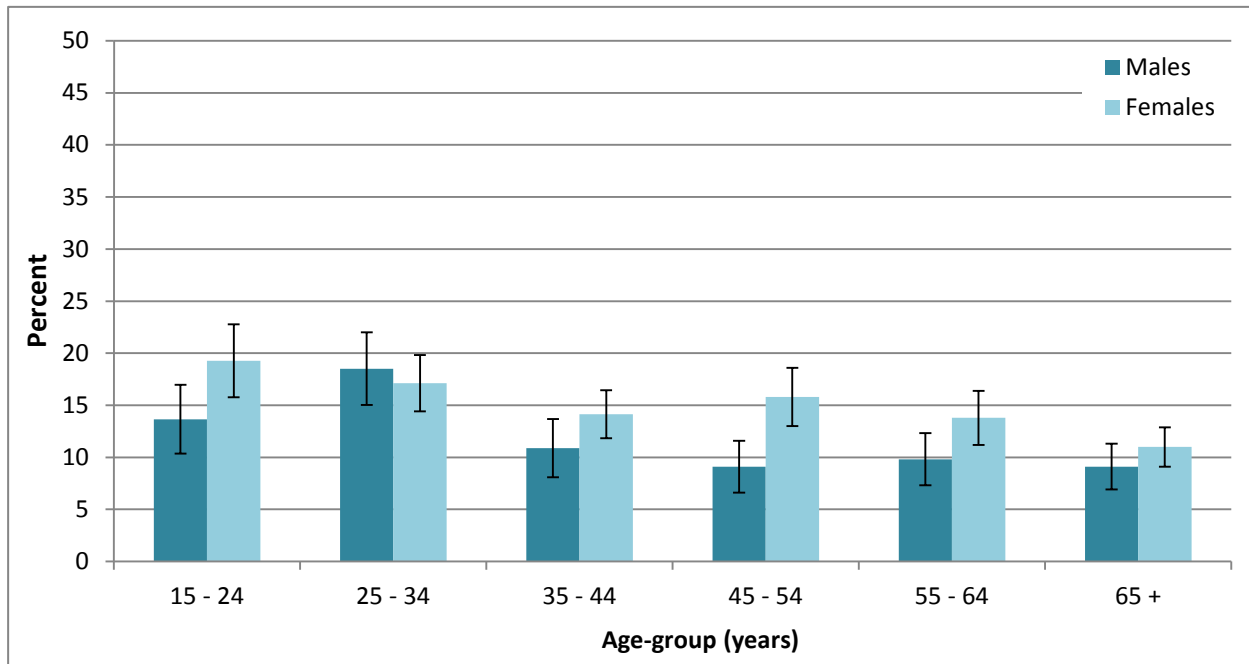
Notes:
1.   Source: 2011/12 New Zealand Health Survey. Error bars are indicative of 95% confidence intervals.

Figure 10: *Gambling on Lotto in the last 12 months, by age group and gender, total population aged 15 years and over (unadjusted prevalence; N=12,596)* [1]
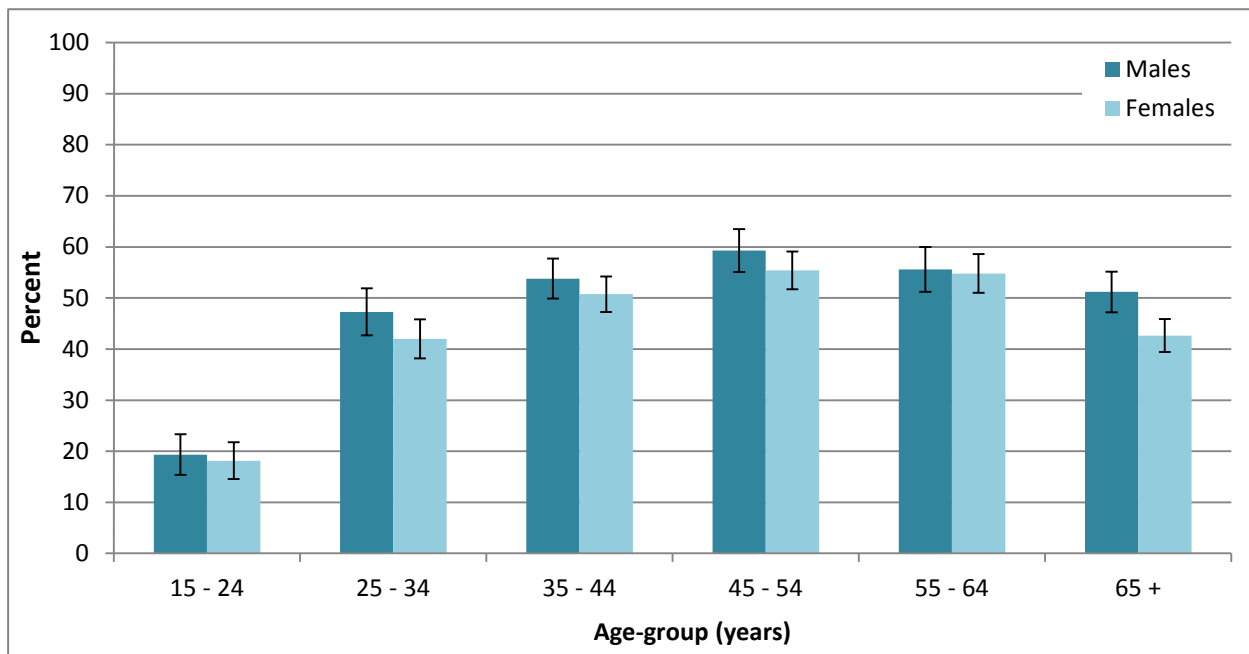
Notes:
1.   Source: 2011/12 New Zealand Health Survey. Error bars are indicative of 95% confidence intervals.

4.2.1.3 By ethnicity

Rates of participation in individual gambling activities for each of the four main ethnic groups are presented in Table 19, Appendix B. After adjusting for age, significant associations were observed between ethnicity and participation in the following gambling activities: any non-Lotto (p<0.0001); any EGM (casino or non-casino) (p<0.0001); Lotto (p<0.0001); Instant Kiwi or other scratch tickets (p<0.0001); non-casino EGMs (p<0.0001); track betting (p<0.0001); Keno (p=0.0021); and, housie (p<0.0001). Table 5 provides odds ratios and 95% confidence intervals for each of these activities by ethnicity. In summary:

- Compared with European/Other, Māori were more likely and Pacific and Asian less likely, to have gambled on any EGM (casino or non-casino), and non-casino EGMs.

- Compared with European/Other, Pacific and Asian were less likely to have gambled on any non-Lotto, Lotto, Instant Kiwi or other scratch tickets,

- Compared with European/Other, Pacific and Asian were significantly less likely to have participated in track betting.

- Compared with European/Other, Māori and Pacific were significantly more likely to have gambled on Keno in the past 12 months.

- Compared with European/Other, Māori and Pacific were significantly more likely and Asian less likely to have gambled on housie in the past 12 months.

Table 5: *Past year participation in specific types of gambling activities by ethnicity – odds ratios and p-values (adjusted prevalence)* [1]

GAMBLING ACTIVITY	ETHNICITY [2]				p-value [3]
	Māori	**Pacific**	**Asian**	**European / Other**	
	Odds ratio (95% CI)	**Odds ratio (95% CI)**	**Odds ratio (95% CI)**	**Odds ratio**	
Any non-Lotto	1.2 (1.0 - 1.3)	0.7 (0.5 - 0.9)	0.3 (0.3 - 0.4)	1	<0.0001
Any gaming machine (casino or non-casino)	1.5 (1.3 - 1.9)	0.8 (0.6 - 1.1)	0.4 (0.3 - 0.6)	1	<0.0001
Lotto	1.1 (0.9 - 1.2)	0.9 (0.7 - 1.1)	0.6 (0.5 - 0.8)	1	<0.0001
Instant Kiwi or other scratch tickets	1.0 (0.9 - 1.2)	0.6 (0.4 - 0.8)	0.3 (0.2 - 0.4)	1	<0.0001
Non-casino gaming machines	1.7 (1.4 - 2.2)	0.8 (0.5 - 1.2)	0.2 (0.1 - 0.4)	1	<0.0001
Track betting	0.8 (0.6 - 1.0)	0.5 (0.3 - 0.8)	0.1 (0.1 - 0.3)	1	<0.0001
Keno	2.2 (1.3 - 3.7)	2.4 (1.2 - 5.0)	0.5 (0.1 - 2.5)	1	0.0021
Housie	3.7 (2.2 - 6.0)	3.1 (1.6 - 6.0)	0.0 (0.0 - 0.2)	1	<0.0001

Notes:
1. Source: 2011/12 New Zealand Health Survey.
2. Respondents are counted in each of the ethnic groups that are applicable to them; respondents who identify with more than one ethnic grouping are included in each of the relevant groups. As such, it is inappropriate to compare these ethnic-specific proportions as mutually exclusive categories. Percentages and 95% confidence intervals have been age-standardised in accordance with World Health Organisation (WHO) age population distributions (Ahmad et al., 2001).
3. Logistic regression analyses have controlled for gender, age-group, neighbourhood deprivation and geography (urban/rural).

4.2.1.4   By neighbourhood deprivation

A number of trends were observed between neighbourhood deprivation and participation in gambling activities (see Table 19, Appendix B). Gambling on the following activities were significantly more prevalent amongst adults living in neighbourhoods with lower levels of deprivation: Lotto only (p=0.026, see Figure 11), sports betting (p=0.0138), and other (p=0.0305). Conversely, gambling on housie was significantly associated with adults living in neighbourhoods with higher levels of deprivation (p=0.0015).

Figure 11: Gambling on Lotto only in the last 12 months, by neighbourhood deprivation[1], total population aged 15 years and over (unadjusted prevalence; N=12,596) [2]
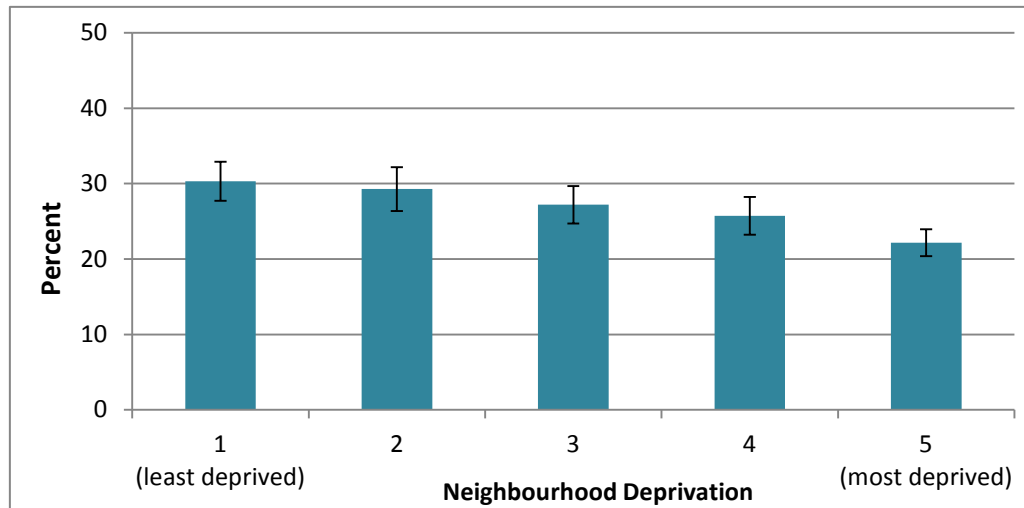
Notes:
1.   Neighbourhood deprivation – as measured by NZDep2006 quintiles.
2.   Source: 2011/12 New Zealand Health Survey. Error bars are indicative of 95% confidence intervals.

4.2.1.5   By geography

Adult respondents who were living in a rural location were significantly less likely than their urban counterparts to gamble on any EGM (casino or non-casino), any casino gambling (tables or EGMs), casino EGMs, casino tables, sports betting, and housie. Table 5 provides odds ratios and p-values for this set of analysis, with prevalence data (estimates and 95% confidence intervals) being presented in Table 19 (see Appendix B).

Table 6:   Past year participation in specific types of gambling activities by geography – odds ratios and p-values (unadjusted prevalence) [1]

GAMBLING ACTIVITY	GEOGRAPHY		p-value [2]
	Rural	Urban	
	Odds ratio (95% CI)	Odds ratio	
Any gaming machine (casino or non-casino)	0.7 (0.5 - 0.9)	1	0.0062
Any casino gambling (tables or gaming machines)	0.4 (0.3 - 0.7)	1	<0.0001
Casino gaming machines	0.5 (0.4 - 0.8)	1	0.0014
Casino tables	0.4 (0.2 - 0.8)	1	0.0132
Sports betting	0.3 (0.2 - 0.7)	1	0.0029
Housie	0.3 (0.1 - 0.6)	1	0.0015

Notes:
1.   Source: 2011/12 New Zealand Health Survey.
2.   Logistic regression analyses have controlled for gender, age-group, ethnicity, and neighbourhood deprivation.

4.2.2 Changes over time – comparison of 2002/03, 2006/07 and 2011/12 NZHS: Involvement in gambling and activities that adults gamble on

Analyses were carried out to examine changes over time with regard to the activities that people had gambled on in the past 12 months. Results were compared across the three NZHS surveys that included gambling questions: 2002/03, 2006/07 and 2011/12. It is important to note that when comparisons are made between the three most recent NZHS surveys (2002/03, 2006/07 and 2011/12), results have been age-standardised in accordance with World Health Organisation (WHO) age population distributions (Ahmed et al., 2001). As such, some of the results that are reported for the 2011/12 NZHS in this 'changes over time' section, may differ slightly to those that are specified elsewhere in this report. For example, while 52.3% of the adult population had gambled over the past-year in the 2011/12 NZHS (as detailed previously), the *age-adjusted rate* of past-year gambling in 2011/12 is 45.7% (as reported below and in Table 20 when comparing across multiple waves of the NZHS).

As illustrated in Figure 12, the proportion of people who had gambled on **any** activity significantly decreased with each survey wave ($p<0.0001$). Significant decreases in participation across the survey waves were also observed for: Lotto ($p<0.0001$), Instant Kiwi ($p<0.0001$), non-casino EGMs ($p<0.0001$), track betting ($p<0.0001$), casino EGMs ($p<0.0001$)[5], sports betting ($p<0.0001$), Keno ($p<0.0001$) and Housie ($p<0.0001$). Further details, including prevalence estimates and 95% confidence intervals are presented in Table 20 (see Appendix C).

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[5] NB: The 2002/03 NZHS did not gather data on individual casino modes (i.e. it asked about 'casino gambling' but not 'casino gaming machines' or 'casino tables'); 2002/03 data can only be presented in relation to 'any casino gambling'.

Figure 12: Past year participation in gambling activities by NZHS survey wave, total population aged 15 years and over (adjusted prevalence) [1]
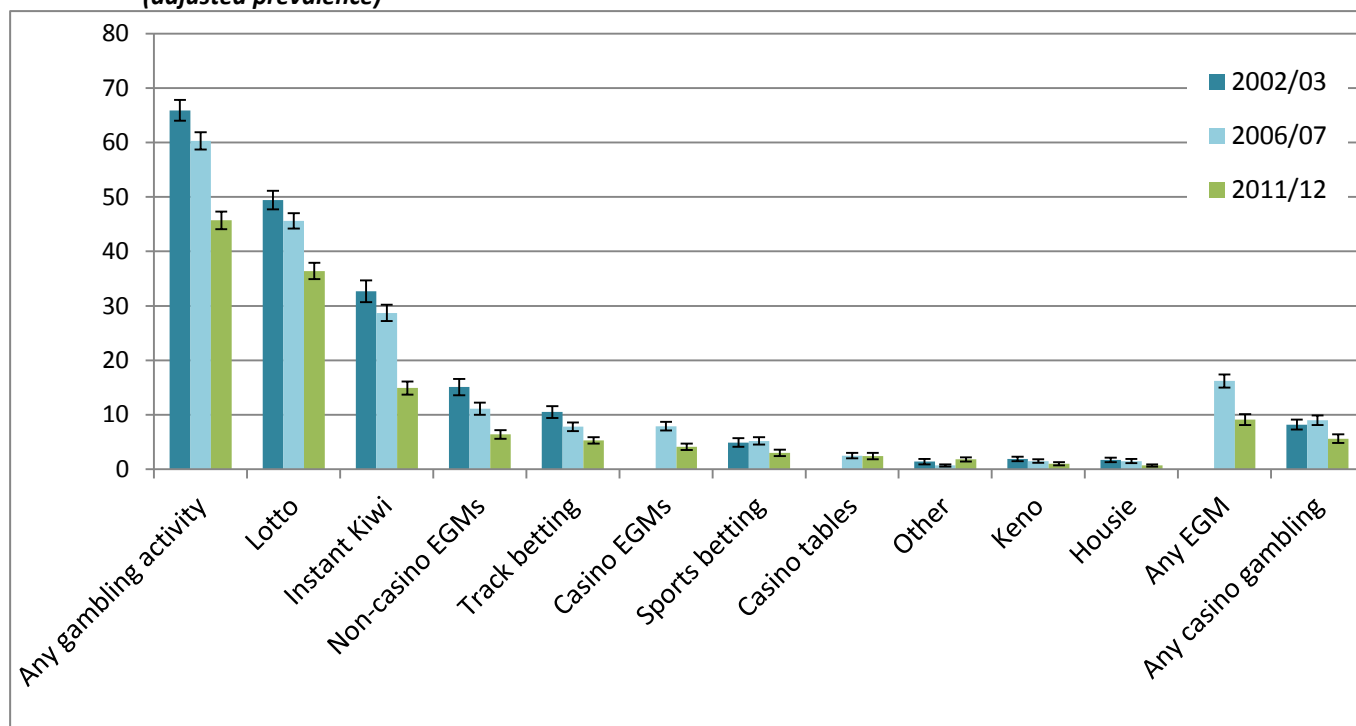
Notes:1. Sources: 2002/03 (N=12,529), 2006/07 (N=12,488) and 2011/12 (N=12.596) New Zealand Health Surveys. Percentages and 95% confidence intervals have been age-standardised in accordance with World Health Organisation (WHO) age population distributions (Ahmad et al., 2001). Error bars are indicative of 95% confidence intervals.

4.3   Number of gambling activities

Table 7 provides a breakdown of the number of activities that respondents had gambled on over the past year.

Nearly one-third of adults had gambled on one activity and a small proportion (2.8%) had gambled on four or more activities.

Table 7: Number of gambling activities participated in during the last 12 months, total population aged 15 years and over (unadjusted prevalence) [1]

NUMBER OF GAMBLING ACTIVITIES IN LAST 12 MONTHS	n	Prevalence for total adults (N=12,596)	Prevalence for past-year gamblers (N=6,549)
		% (95% CI)	% (95% CI)
None	6,047	47.7 (46.3 - 49.1)	-
One	4,137	32.8 (31.6 - 34.0)	62.8 (61.0 - 64.6)
Two	1,534	12.3 (11.5 - 13.1)	23.5 (22.1 - 24.9)
Three	556	4.4 (3.9 - 4.9)	8.4 (7.5 - 9.3)
Four or more	322	2.8 (2.4 - 3.2)	5.3 (4.5 - 6.1)

Notes:
1.   Source: 2011/12 New Zealand Health Survey.

4.3.1 Number of gambling activities by demographics

Significant interactions were observed between the number of gambling activities and gender, age-group, ethnicity and geography. The following sections present significant results relating to demographics and the number of gambling activities that adults had participated in, while detailed results can be found in Table 21 (see Appendix D).

4.3.1.1 By gender

As shown in Figure 13, males were significantly more likely than females (p<.0001) to have gambled on four or more activities in the last 12 months; 3.7% of males compared with 1.9% of females. See Table 21 (Appendix D) for detailed results.

Figure 13: *Number of gambling activities participated in during the last 12 months, by gender, total population aged 15 years and over (unadjusted prevalence; N=12,596) [1]*
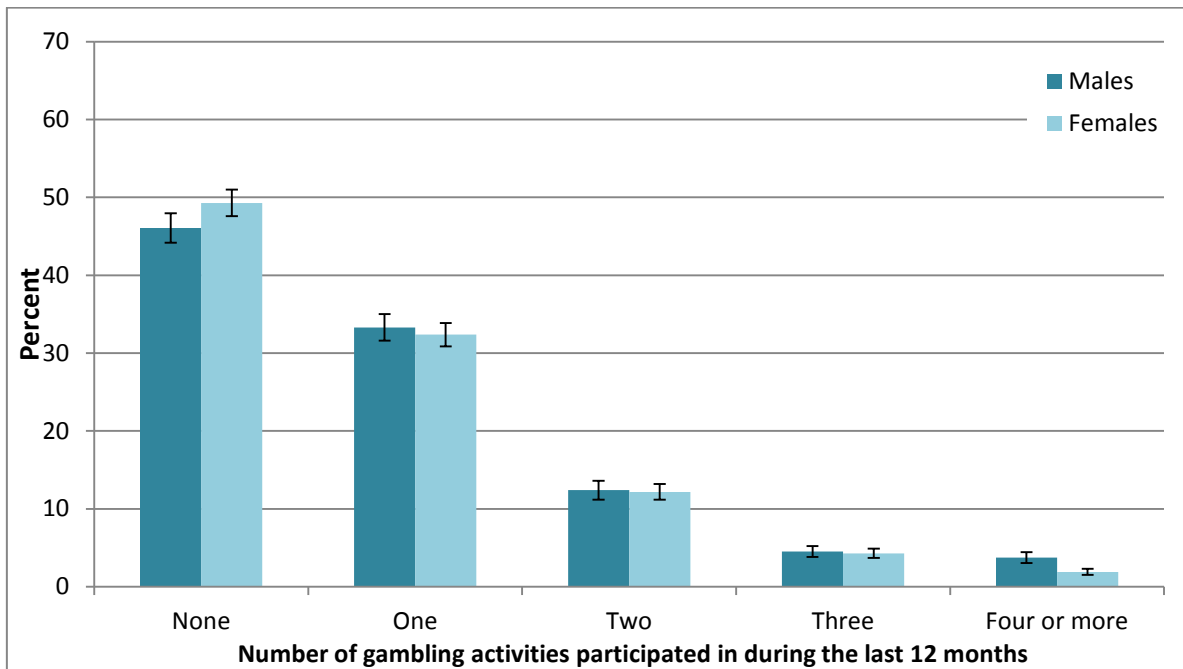
Notes:
1.   Source: 2011/12 New Zealand Health Survey. Error bars are indicative of 95% confidence intervals.

4.3.1.2 By age-group

Age was significantly associated with the number of activities that people had gambled on over the past year (p<0.0001). The following trends were observed in relation to age-group and the number of gambling activities:

- While the majority of 15-17 year olds (94.9%) had gambled on *zero* activities in the past 12 months, this decreased steadily to 38.9% for 45-54 year olds and then increased slightly to 47.7% for those aged 65 and older.

- The proportion of adults who had gambled on *one* activity increased with age, from 25.2% for those aged 18-24 years to 36.3% for those aged 65 or more.

- The proportion of respondents who had gambled on *four or more* activities decreased with age: 4.3% of those aged 18-24 compared with 1.3% of those aged 65 or older.

Detailed results can be found in Table 21 (Appendix D).

4.3.1.3 By ethnicity

There was a significant association between ethnicity and the number of past-year gambling activities (p<0.0001). Of particular note, Asian people were the most likely to have gambled on *zero* activities (62.9%), followed by Pacific (51.9%), European/Other (47.3%) and Māori (45.9%). There was a general trend for greater proportions of Māori and European/Other to gamble on more activities than Pacific and Asian adults, however, small cell-sizes for some of these items mean that these results should be treated with caution. See Table 21 (Appendix D) for detailed results relating to this item.

4.3.1.4 By neighbourhood deprivation

No trends or significant associations were observed between level of neighbourhood deprivation and the number of activities that adults had gambled on the past 12 months. See Table 21 (Appendix D) for further details.

4.3.1.5 By geography

Geographical location (i.e. living in an urban or rural location) was significantly associated with the number of gambling activities that adults had engaged in over the past 12 months (p=0.0013). The main difference appears to be in relation those who had gambled on *four or more* activities, with rural respondents being less likely than their urban peers, to have gambled on this many activities. However, small cell-sizes mean that these results should be treated with caution. Further details are provided in Table 21 (Appendix D).

4.3.2 Number of gambling activities by past-year participation group

Table 8 presents the number of gambling activities participated in during the last 12 months, by past-year gambling participation group (for those who had gambled in the past year). As outlined previously (see Table 7), nearly two-thirds (62.8%) of people who had gambled in the past 12 months had gambled on *one* activity only. These results illustrate that the majority of those who had gambled on Lotto in the past year had only gambled on *one* activity (59.7%). In comparison, one-in-two Keno gamblers (52.3%) and 40% of casino table gamblers (40.1%) had participated in *four or more* activities in the past year. Around one-third of those who gambled on EGMs had gambled on *four or more* activities: casino EGMs (33.1%) and non-casino EGMs (29.2%).

Table 8:   Number of gambling activities participated in during the last 12 months, by past-year gambling participation group, past-year gamblers (unadjusted prevalence; N=6,549) [1]

| | NUMBER OF GAMBLING ACTIVITIES IN LAST 12 MONTHS | | | | | | | |
| | One | | Two | | Three | | Four or more | |
	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)
Amongst all <u>past-year gamblers</u>	4,137	62.8 (61.0 - 64.6)	1,534	23.5 (22.1 - 24.9)	556	8.4 (7.5 - 9.3)	322	5.3 (4.5 - 6.1)
Amongst all past-year Lotto gamblers	3,428	59.7 (57.9 - 61.6)	1,425	25.1 (23.6 - 26.7)	532	9.3 (8.3 - 10.3)	308	5.9 (5.0 - 6.7)
Amongst all past-year Instant Kiwi (or other scratch ticket) gamblers	254	16.7 (14.1 - 19.2)	778	45.3 (42.3 - 48.3)	377	21.4 (18.8 - 24.1)	268	16.6 (14.2 - 19.1)
Amongst all past-year non-casino gaming machine gamblers	108	13.1 (9.8 - 16.4)	224	28.8 (24.6 - 33.1)	246	28.9 (25.0 - 32.8)	225	29.2 (24.8 - 33.5)
Amongst all past-year track gamblers	125	16.2 (12.5 - 19.9)	259	33.1 (28.7 - 37.5)	178	24.6 (20.5 - 28.7)	184	26.1 (21.8 - 30.5)
Amongst all past-year casino gaming machine gamblers	80	14.6 (10.3 - 19.0)	141	28.2 (23.2 - 33.3)	120	24.0 (19.5 - 28.6)	158	33.1 (27.5 - 38.7)
Amongst all past-year sports betting gamblers	32	10.7 (6.0 - 15.3)	78	25.6 (19.7 - 31.6)	66	24.2 (17.5 - 30.8)	102	39.6 (31.9 - 47.2)
Amongst all past-year casino table gamblers	<30	-	33	18.7 (11.8 - 25.5)	50	28.6 (20.7 - 36.5)	74	40.1 (31.1 - 49.1)
Amongst all past-year 'other (including internet)' gamblers	49	25.4 (16.7 - 34.0)	52	37.4 (27.4 - 47.5)	34	15.8 (9.2 - 22.4)	<30	-
Amongst all past-year Keno gamblers	<30	-	32	20.9 (11.6 - 30.2)	38	22.4 (14.1 - 30.8)	72	52.3 (41.5 - 63.2)
Amongst all past-year Housie gamblers	33	18.2 (10.7 - 25.8)	46	25.3 (16.7 - 33.9)	<30	-	52	39.7 (28.1 - 51.2)

Notes:
1.   Source: 2011/12 New Zealand Health Survey.

4.3.3   Changes over time – comparison of 2002/03, 2006/07 and 2011/12 NZHS: Number of gambling activities

Results from the 2002/03, 2006/07 and 2011/12 New Zealand Health Surveys were compared to assess if there had been changes over time in the number of activities that adults had gambled on. As outlined previously, it is important to note that when comparisons are made between the three most recent NZHS surveys (2002/03, 2006/07 and 2011/12), results have been age-standardised in accordance with World Health Organisation (WHO) age population distributions (Ahmed et al., 2001). As such, some of the results that are reported for the 2011/12 NZHS in this 'changes over time' section, may differ slightly to those that are specified elsewhere in this report. For example, while 5.3% of the adult population had gambled on four or more activities in the past-year in the 2011/12 NZHS (as detailed above), the *age-adjusted rate* for gambled on four or more

activities in 2011/12 is 3.0% (as reported below in Table 9 and Figure 14 which compare rates across multiple waves of the NZHS).

As shown in Table 9, significant changes over time were observed (p<0.0001); there was an overall decreasing trend in the number of gambling activities that people were participating in, with each survey wave. This trend should be considered in the context of the increased proportion of respondents who indicated that they were non-gamblers (i.e. they had gambled on zero activities) in 2011/12 than in previous survey waves.

Table 9: *Number of gambling activities participated in during the last 12 months by NZHS survey wave, total population aged 15 years and over (adjusted prevalence; 2002/03 NZHS N=12,529, 2006/07 NZHS N=12,488, 2011/12 NZHS N=12,596)* [1]

| NUMBER OF GAMBLING ACTIVITIES IN LAST 12 MONTHS | NZHS SURVEY WAVE | | | | | | p-value [2] |
| | 2002/03 (N=12,529) | | 2006/07 (N=12,488) | | 2011/12 (N=12,596) | | |
	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	
0	3,912	34.1 (32.2 - 35.9)	4,265	39.7 (38.1 - 41.4)	6,047	54.3 (52.7 - 55.8)	
1	4,229	30.4 (28.8 - 32.0)	4,124	27.6 (26.3 - 29.0)	4,137	27.6 (26.3 - 29.0)	
2	2,567	20.2 (18.6 - 21.7)	2,504	18.1 (17.0 - 19.2)	1,534	10.9 (9.9 - 11.9)	<0.0001
3	1,105	9.4 (8.4 - 10.4)	1,002	7.7 (6.9 - 8.5)	556	4.2 (3.6 - 4.8)	
4 or more	716	5.9 (5.0 - 6.8)	593	5.2 (4.5 - 5.9)	322	3.0 (2.4 - 3.6)	

Notes:
1. Sources: 2002/03, 2006/07 and 2011/12 New Zealand Health Surveys. NB: Percentages and 95% confidence intervals have been age-standardised in accordance with World Health Organisation (WHO) age population distributions (Ahmad et al., 2001). As such, the results presented here differ slightly to those presented earlier in Table 7.
2. Logistic regression analyses have controlled for gender, age, ethnicity, neighbourhood deprivation, and geography (urban/rural).

Figure 14 provides an illustration of the decrease in the proportions of people gambling on *two*, *three* and *four or more* activities across the survey waves, along with a substantial increase in the proportion of people who had not gambled in the past 12 months (*zero* activities). It also shows that the proportion of people who had gambled on *one* activity remained fairly stable.

Figure 14: Number of gambling activities participated in during the last 12 months by NZHS survey wave, total population aged 15 years and over (adjusted prevalence) [1]
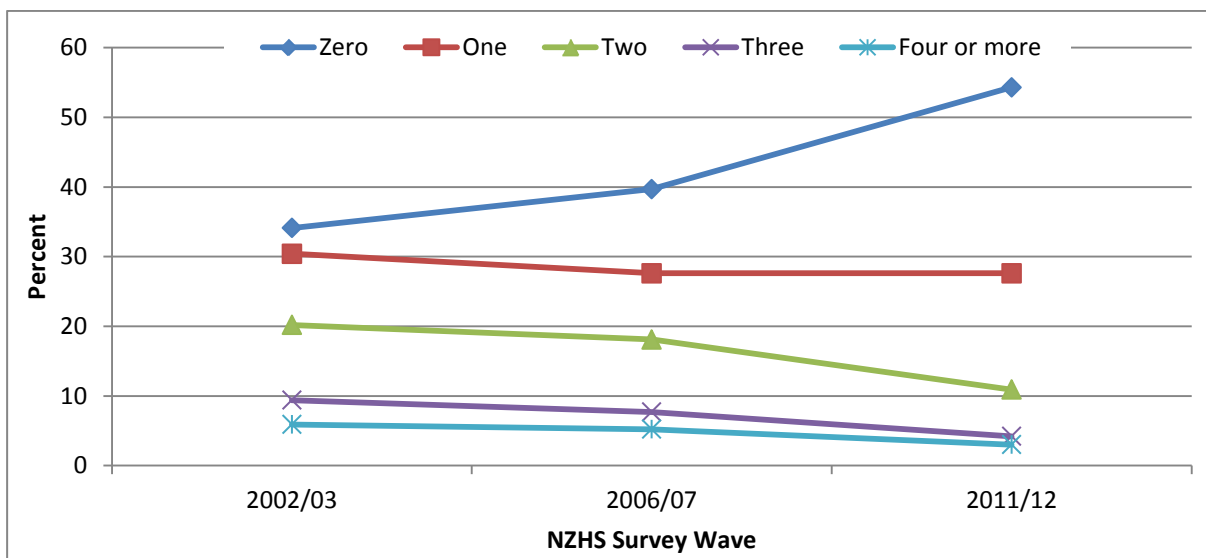
Notes: 1. Sources: 2002/03, 2006/07 and 2011/12 New Zealand Health Surveys. Percentages and 95% confidence intervals have been age-standardised in accordance with World Health Organisation (WHO) age population distributions (Ahmad et al., 2001).

4.4   Preferred gambling activity

Adults who had gambled in the past year were asked to specify their preferred gambling activity. The three most popular activities were Lotto (43.8%), followed by Instant Kiwi or other scratch tickets (18.4%) and track betting (11.5%). The remaining activities were all specified by less than ten percent of past-year gamblers. See Table 10 for further details.

Table 10: Preferred gambling activity, past-year gamblers (unadjusted prevalence; N=6,549) [1]

	PREFERRED GAMBLING ACTIVITY [2]	
	n	N (95% CI)
Lotto [3]	1,027	43.8 (41.2 - 46.4)
Instant Kiwi or other scratch tickets	395	18.4 (16.3 - 20.5)
Track betting	259	11.5 (9.9 - 13.2)
Non-casino gaming machines	201	8.5 (7.0 - 10.0)
Casino gaming machines	120	5.7 (4.5 - 6.9)
Sports betting	76	4.3 (3.1 - 5.4)
Casino tables	54	3.6 (2.5 - 4.8)
Other form of gambling (including Internet-based gambling)	45	2.9 (1.9 - 3.9)
Housie	52	1.3 (0.8 - 1.7)

Notes:
1. Source: 2011/12 New Zealand Health Survey.
2. Due to small cell sizes/denominators (n<30), some activities have been combined with others to enable their inclusion in the analyses.
3. Lotto includes 'Strike', 'Powerball', 'Big Wednesday' and 'Keno'.

4.4.1 Preferred gambling activity by demographics

Preferred gambling activity was broken down by demographic characteristics. Table 22 (Appendix E) provides detailed results for this set of analyses, with trends and key results including:

- While Instant Kiwi was preferred by greater proportions of females (26.5%) than males (10.6%), greater proportions of males preferred track (males 15.8%, females 7.1%) and sports betting (males 8.0%, females registered negligible percent).

- With regard to age, Lotto and track betting were more popular amongst the older age-brackets while greater proportions of participants from the younger age-groups preferred Instant Kiwi.

- No meaningful trends were observed in relation to ethnicity, neighbourhood deprivation or geography (urban/rural location).

4.5   SUMMARY: PAST YEAR GAMBLING PARTICIPATION

Involvement in gambling:

- Approximately one-half (52%) of all adults aged 15 years and over had gambled on at least one activity in the last 12 months.

- Ethnicity and age-group were significantly associated with past-year gambling:

  - Approximately one-half of Māori (54%), Pacific (49%) and European/Other (53%) and one-third of Asian people (37%) had gambled in the past 12 months.

  - Approximately one-third of respondents aged 15-24 years (33%) had gambled in the past year compared with 50%-60% percent of adults in other age groups.

- The proportion of people who had gambled on any activity has significantly decreased with each NZHS wave: 65.9% in 2002/03, 60.3% in 2006/07, and 45.7% in 2011/12[6].

Activities that adults gamble on:

- The most popular gambling activities were NZ Lotteries products[7] (45%). Less than ten percent of adults had gambled on EGMs (casino and/or non-casino), track or sports betting, casino gambling (EGMs and/or tables), Keno, housie and 'other' in the previous year.

- Males were significantly more likely than females to have gambled on: Lotto, track betting, sports betting, casino tables and 'other'. Females were more likely to gamble on Instant kiwi (or other scratch tickets) and housie.

- Age was significantly related to participation in most gambling activities:

  - Any non-Lotto, any EGM, any casino activity, Instant Kiwi, sports betting and casino tables were more popular with adults aged 25-34 years; and,

  - 'Lotto only', Lotto, and track betting were more popular with adults aged 45-54 years.

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[6] NB: These rates have been age-standardised in accordance with World Health Organisation (WHO) age population distributions (Ahmad et al., 2001).

[7] 'Lotto, 'Strike', 'Powerball', and 'Big Wednesday'.

- The following significant trends were observed in relation to ethnicity and participation in gambling activities:

  o Compared with European/Other, Māori were more likely and Pacific and Asian less likely, to have gambled on any EGM (casino or non-casino), and non-casino EGMs.

  o Compared with European/Other, Pacific and Asian were less likely to have gambled on any non-Lotto, Lotto, Instant Kiwi or other scratch tickets,

  o Compared with European/Other, Pacific and Asian were significantly less likely to have participated in track betting.

  o Compared with European/Other, Māori and Pacific were significantly more likely to have gambled on Keno in the past 12 months.

  o Compared with European/Other, Māori and Pacific were significantly more likely and Asian less likely to have gambled on housie in the past 12 months.

- Gambling on 'Lotto only', sports betting and 'other' was significantly more prevalent amongst adults living in neighbourhoods with lower levels of deprivation. Gambling on housie was significantly more likely amongst adults living in neighbourhoods with higher levels of deprivation.

- Adults living in rural locations were significantly less likely than their urban counterparts to gamble on any EGMs (casino or non-casino), any casino gambling (tables or gaming machines), casino EGMs, casino tables, sports betting, and housie.

- Significant decreases in participation were observed across the three NZHS waves (2002/03, 2006/07, 2011/12) for: Lotto, Instant Kiwi, non-casino EGMs, track betting, casino EGMs (NB: data on casino EGMs was only available for 2006/07 and 2011/12), sports betting, Keno and Housie.

Number of gambling activities:

- Approximately one-third (33%) of adults had gambled on *one* activity in the last 12 months.

- Three percent of adults had gambled on *four or more* activities in the last 12 months. This was more prevalent amongst males, younger age groups, Māori and European/Other, those who lived in urban locations, and people who had gambled on Keno, casino tables, and EGMs (casino and/or non-casino).

- The number of gambling activities that adults engaged in significantly decreased over time - there was an overall decreasing trend with people participating in fewer activities with each survey wave (NZHS waves 2002/03, 2006/07, 2011/12).

Preferred gambling activity:

- The three most popular activities were Lotto (44%), followed by Instant Kiwi or other scratch tickets (18%) and track betting (12%). The remaining activities were all specified by less than ten percent of past-year gamblers.

- Preferences differed by gender and age-group:

  - Instant Kiwi was preferred by greater proportions of females than males, and greater proportions of males preferred track and sports betting.

  - Lotto and track betting were more popular amongst the older age-brackets while younger age-groups preferred Instant Kiwi.

Past year gambling participation: Comparison of 2011/12 NZHS and the 2012 National Gambling Study

- The 2011/12 wave of the NZHS found that approximately one-half of adults had participated in some form of gambling in the last 12 months. The National Gambling Study reported a past 12-month gambling participation rate of 80%.

- This study found a significant and steady decline in the rates of past-year gambling: 66% in 2002/03, 60% in 2006/07 and 50% in 2011/12. This trend is consistent with those observed by National prevalence studies in New Zealand.

- This study found that Lottery products were the most popular and preferred gambling activities, with almost one-half of adults having gambled on Lotto in the past year. In contrast, less than ten percent of adults had gambled on EGMs (casino and/or non-casino), track or sports betting, casino gambling (EGMs and/or tables), Keno, housie and 'other' in the previous year. While it is difficult to make direct comparisons (due to varying categorisation of gambling activities), these results seem largely consistent, although more conservative than those observed in both the National Gambling Study.

- This study found that approximately one-third of adults had gambled on only one activity in the last 12 months, and a small proportion (three percent) had gambled on 'four or more' activities. Gambling on a greater number of activities was more prevalent amongst males, younger age groups, Māori and European/Other, those who lived in urban locations, and people who had gambled on Keno, casino tables, and EGMs (casino and/or non-casino). These findings are inconsistent with the National Gambling Study which reported that one-fifth of adults had gambled on 'four or more' activities.

5. RESULTS: PROBLEMATIC GAMBLING

The following section of the report outlines results that relate to the prevalence of problem gambling (including changes over time), the profile of people experiencing problem gambling, the risks associated with different gambling activities, and how problem gambling relates to the number of activities that people had gambled on in the previous 12 months.

5.1   PGSI item endorsement and prevalence of problem gambling

All participants completed the nine-item PGSI. Three of the nine domains/indicators registered prevalence estimates (for all adults) in excess of one percent:

-    1.7% indicated that they had experienced issues around *loss of control*;

-    1.5% had experienced *feelings of guilt*; and,

-    1.2% reported *chasing losses.*

Borrowing was the least endorsed item of the PGSI, with only 40 participants (0.3%) indicating that they had borrowed money or sold items in order to obtain money to gamble. Table 11 provides an overview of participant responses to the PGSI items.

Table 11:   *Responses to individual PGSI items – prevalence of experiencing problematic gambling behaviours in the past 12 months, total population aged 15 years and over (unadjusted prevalence)* [1]

DOMAIN	INDICATOR	n	Prevalence for total adults (N=12,596) % (95% CI)	Prevalence for past-year gamblers (N=6,549) % (95% CI)	Estimated number of people (95% CI) [2]
Loss of control	Betting more than could afford	271	1.7 (1.4 - 1.9)	3.2 (2.6 - 3.7)	58,700 (48,900 - 68,600)
Feelings of guilt	Feeling guilty about gambling	203	1.5 (1.2 - 1.8)	2.9 (2.3 - 3.4)	52,900 (42,800 - 63,100)
Chasing losses	Returning later to win back losses	147	1.2 (0.9 - 1.4)	2.2 (1.7 - 2.7)	40,600 (31,800 - 49,400)
Problem recognition	Feel they might have a problem with gambling	122	0.9 (0.7 - 1.1)	1.6 (1.3 - 2.0)	30,400 (23,400 - 37,500)
Criticism	Other people criticising gambling	114	0.9 (0.7 - 1.1)	1.8 (1.4 - 2.2)	32,900 (25,500 - 40,300)
Negative effects on health	Gambling causing health problems including stress or anxiety	83	0.5 (0.4 - 0.7)	1.0 (0.7 - 1.3)	18,700 (13,500 - 24,000)
Tolerance	Needing to gamble with more money to get the same feeling of excitement	80	0.5 (0.4 - 0.6)	1.0 (0.7 - 1.2)	17,900 (12,900 - 22,900)
Financial problems	Gambling causing financial problems for oneself or household	79	0.5 (0.3 - 0.6)	0.9 (0.7 - 1.2)	16,900 (12,200 - 21,600)
Borrowing	Borrowing money or selling items to get money to gamble	40	0.3 (0.2 - 0.4)	0.6 (0.4 - 0.8)	10,900 (6,500 - 15,300)

Notes:
1. Source: 2011/12 New Zealand Health Survey.
2. Estimated number of people has been calculated using New Zealand 2006 Census data.

Table 12 provides prevalence rates of the PGSI categorisation for total adults, past-year gamblers, and the estimated number of people. It shows that 0.2% of participants satisfied the PGSI criteria for problem gambling. This equates to an estimated 8,100 adults (aged 15 years and over). A further one percent, or 35,300 people, were categorised as moderate-risk gamblers. This means that a total of 1.2% satisfied the criteria for moderate-risk/problem gambling in New Zealand; approximately 43,400 New Zealand adults are experiencing negative consequences as a result of their own gambling.

An additional 2.0% of adults were categorised as low-risk gamblers - meaning that a further 69,400 adults are experiencing low levels of problems associated with their gambling. This group are potentially at-risk of experiencing gambling related problems in the future.

Table 12:   Gambling Status (PGSI categorisation), total population aged 15 years and over (unadjusted prevalence) [1]

PGSI CATEGORISATION	n	Prevalence for total adults (N=12,594) % (95% CI)	Prevalence for past-year gamblers (N=6,547) % (95% CI)	Estimated number of people [2] (95% CI)
Non-gambler	6,047	47.7 (46.4 - 49.1)	-	1,685,900 (1,637,200 - 1,734,600)
Non-problem / Recreational	6,092	49.1 (47.7 - 50.5)	93.9 (93.1 - 94.7)	1,733,300 (1,684,100 - 1,782,500)
Low-risk	272	2.0 (1.6 - 2.3)	3.8 (3.1 - 4.4)	69,400 (58,000 - 80,700)
Moderate-risk	144	1.0 (0.8 - 1.2)	1.9 (1.5 - 2.3)	35,300 (27,500 - 43,100)
Problem	39	0.2 (0.1 - 0.3)	0.4 (0.3 - 0.6)	8,100 (4,700 - 11,500)
Combined moderate-risk and problem	183	1.2 (1.0 - 1.5)	2.4 (1.9 - 2.8)	43,400 (35,100 - 51,800)

Notes:
1. Source: 2011/12 New Zealand Health Survey.
2. Estimated number of people is based on calculations using New Zealand 2006 Census data.

5.1.1   Changes over time – comparison of 2006/07 and 2011/12 NZHS: Prevalence of problem gambling

Significant changes (p<0.0001) were observed in the distribution of PGSI scores from the 2006/07 and 2011/12 survey waves (NB: as the 2002/03 NZHS did not include the PGSI, comparisons of problem gambling status cannot be made between the 2002/03 survey and the two most recent surveys). As noted earlier, when comparisons are made between different waves of the NZHS surveys (in this case between 2006/07 and 2011/12), results have been age-standardised in accordance with World Health Organisation (WHO) age population distributions (Ahmed et al., 2001). As such, some of the results that are reported for the 2011/12 NZHS in this 'changes over time' section, may differ slightly to those that are specified elsewhere in this report. For example, while 1.2% of the adult population satisfied moderate-risk/problem gambling criteria in the 2011/12 NZHS (as detailed previously), the *age-adjusted rate* of moderate-risk/problem gambling in 2011/12 is 1.3% (as reported in Table 23 and Figure 15 which compare multiple waves of the NZHS).

Age adjusted prevalence estimates[8] reveal a significant change (p<0.0001) in the overall distribution of PGSI scores from the 2006/07 and 2011/12 NZHS survey waves. In particular:

- **No significant** changes (based on overlapping 95% confidence intervals) were observed in the proportions of *problem* (0.4% in 2006/07 and 0.2% in 2011/12) or *moderate-risk gamblers* (1.4% in 2006/07 and 1.0% in 2011/12).

- **Significant** changes (p<0.0001; based on non-overlapping 95% confidence intervals) were observed in the proportions of:

  - *non-gamblers*: 39.7% in 2006/07 and 54.3% in 2011/12;

  - *non-problem/recreational gamblers*: 54.7% in 2006/07 and 42.3% in 2011/12; and,

  - *low-risk gamblers*: 3.7% in 2006/07 and 2.1% in 2011/12.

Table 23 (Appendix F) provides further details on changes over time for PGSI scores while Figure 15 illustrates changes for those categories associated with harm from gambling (i.e. low-risk, moderate-risk, problem, and combined moderate-risk / problem).

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[8] NB: The rates discussed here for 2011/12 differ to those presented in Table 12, as they have been age-standardised in accordance with World Health Organisation (WHO) age population distributions (Ahmad et al., 2001).

Figure 15: *Prevalence of problem gambling by NZHS survey wave, total population aged 15 years and over (adjusted prevalence)* [1]
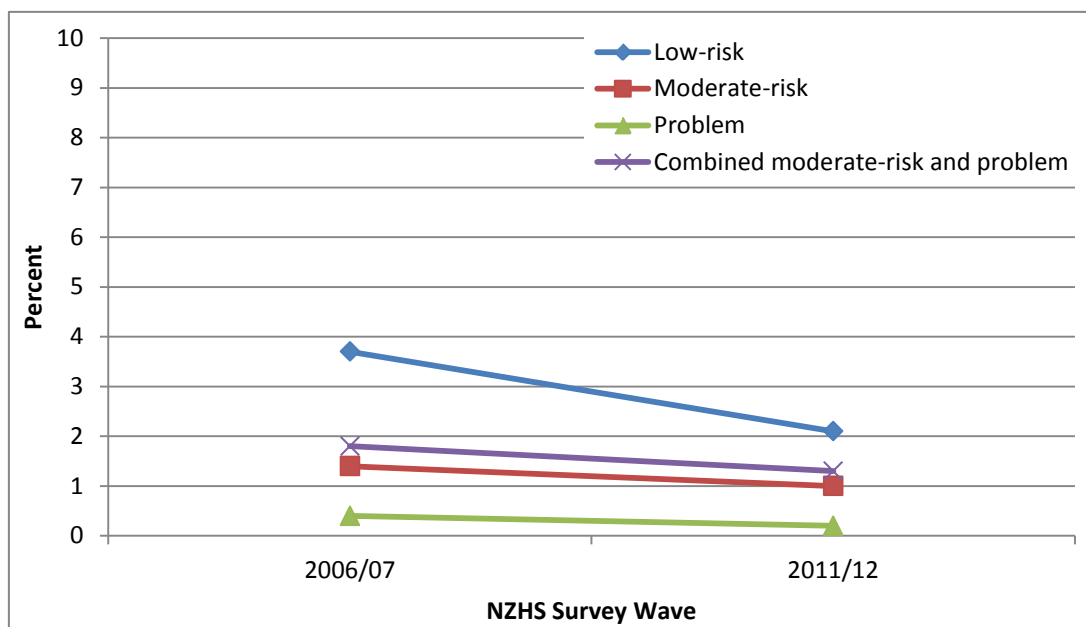
Notes:
1. Sources: 2006/07 and 2011/12 New Zealand Health Surveys. Percentages and 95% confidence intervals have been age-standardised in accordance with World Health Organisation (WHO) age population distributions (Ahmad et al., 2001).

5.2   Profile of people experiencing problem gambling

A number of significant associations were observed between PGSI categorisation and demographic characteristics. Moderate-risk and problem gambling categories have been combined in this section due to sample sizes / small numbers. Significant findings are discussed in the following sub-sections, while further details (prevalence estimates and 95% confidence intervals, odds ratios and p-values) can be found in Table 24, Appendix G.

5.2.1   By gender

A significant association was observed between gender and moderate-risk/problem gambling (p=0.0023), with males being nearly twice as likely (OR=1.8) as females to be categorised as problem/moderate gamblers. Figure 16 illustrates the proportions of males and females who were low-risk and moderate-risk/problem gamblers.

Figure 16: Problem gambling level, by gender, total population aged 15 years and over (unadjusted prevalence; N=12,594) [1]
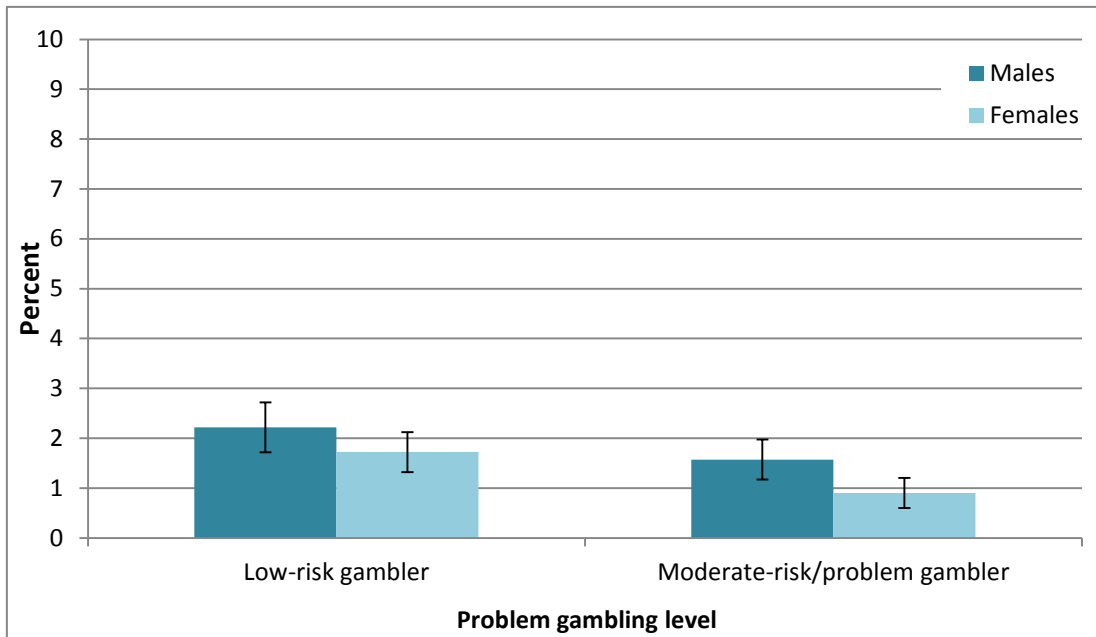
Notes:
1.   Source: 2011/12 New Zealand Health Survey. Error bars are indicative of 95% confidence intervals.

5.2.2   By age-group

Age was significantly associated with gambling status (p=0.0046). Those aged '25-34' and '45-54' were approximately three and a half times more likely (OR=3.4 and OR=3.6 respectively) than those aged '65 or older' to satisfy the criteria for moderate-risk/problem gambling. Figure 17 illustrates the odds-ratios for moderate-risk/problem gambling by age-group.

Figure 17: Moderate-risk/problem gambling, by age-group, total population aged 15 years and over (unadjusted prevalence; N=12,594) [1]
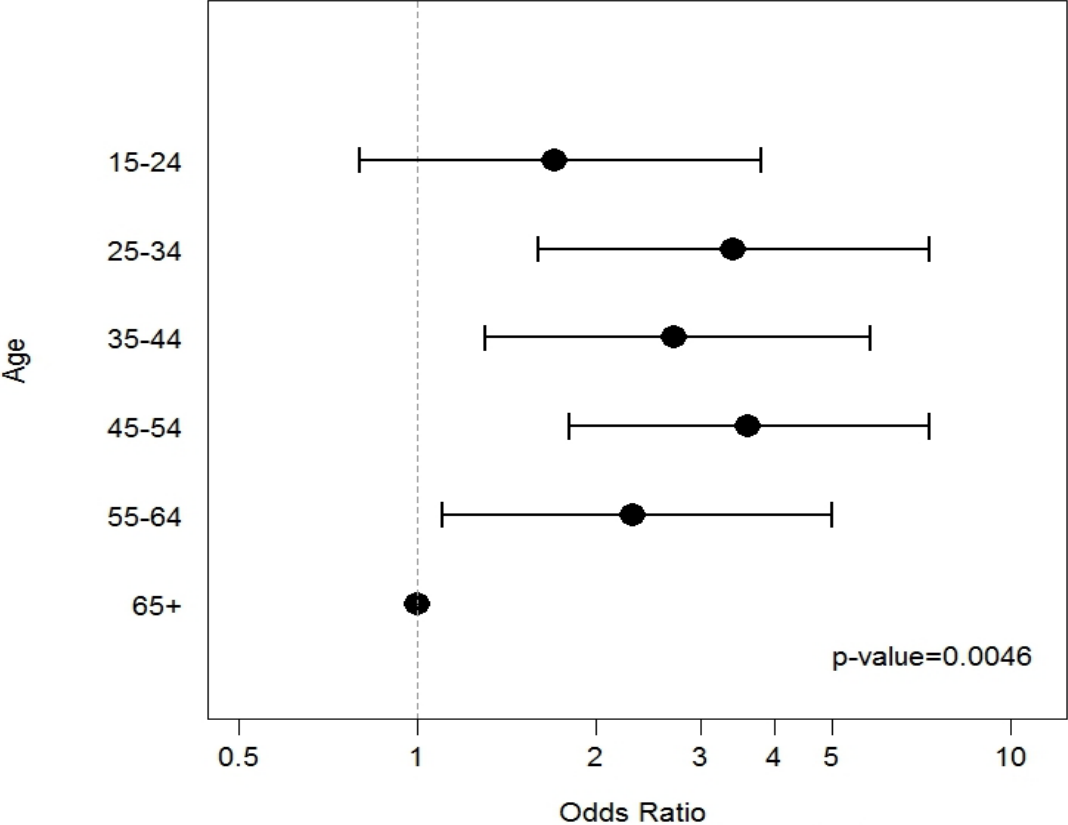
Notes:
1. Source: 2011/12 New Zealand Health Survey. Error bars are indicative of 95% confidence intervals.

5.2.3 By ethnicity

A significant association was observed between ethnicity and gambling status (<0.0001). Figure 18 illustrates the odds ratios for ethnicity and gambling status and shows that Māori and Pacific people were approximately three times more likely (OR=3.2 for Māori, OR=3.0 for Pacific) than European/Other to be categorised as moderate-risk/problem gamblers.

Figure 18: Moderate-risk/problem gambling, by ethnicity, total population aged 15 years and over (unadjusted prevalence; N=12,594) [1]
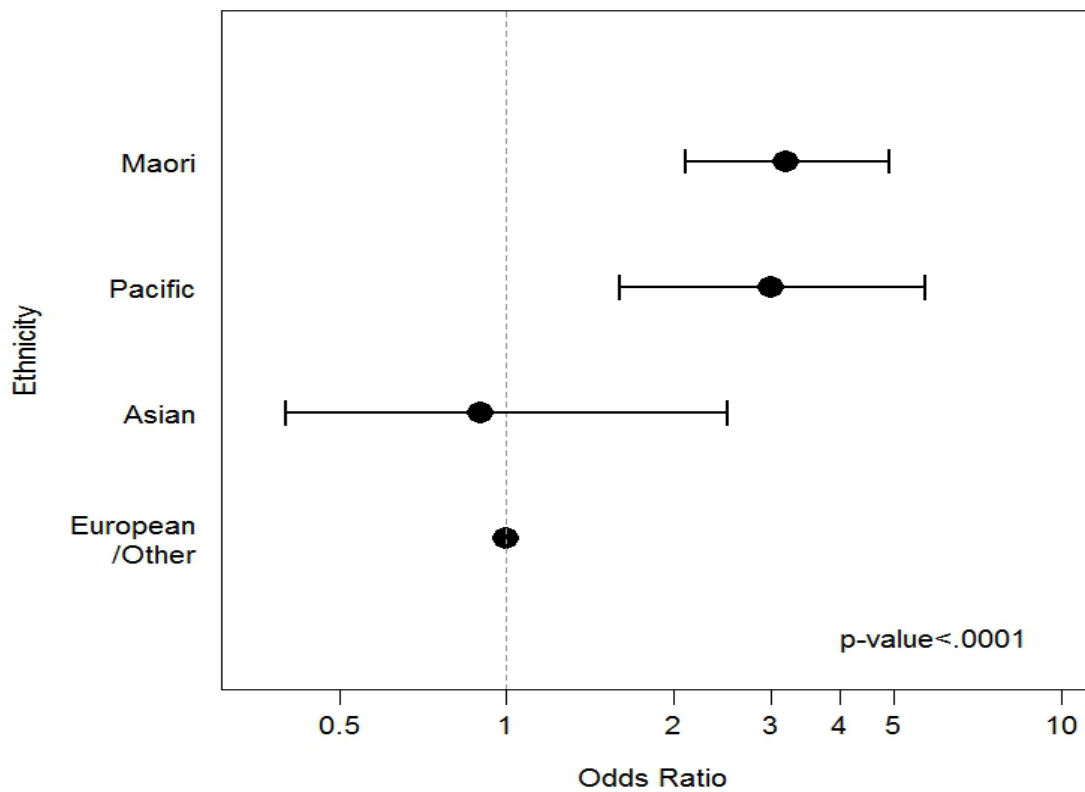
Notes:
1. Source: 2011/12 New Zealand Health Survey. Error bars are indicative of 95% confidence intervals.

5.2.3.1 Changes over time – comparison of 2006/07 and 2011/12 NZHS: Prevalence of problem gambling by ethnicity

Results from the 2006/07 and 2011/12 New Zealand Health Surveys were compared to assess if there had been changes over time in the prevalence of problem gambling for different ethnic groups. A significant association was observed (p<0.0001). Age adjusted prevalence estimates[9] reveal that increased proportions of Māori and European/Other were classified as 'non-gamblers' in 2011/12 than in 2006/07, and of Māori and European/Other who had gambled in the past 12 months, greater proportions were gambling at 'non-problematic levels' in 2011/12 than in 2006/07. No changes were found in the gambling status of Pacific or Asian people from 2006/07 to 2011/12, and no significant changes were observed in relation to moderate-risk/problem gambling for any of the ethnic groups. However, these findings should be treated with caution due to small numbers in the moderate-risk/problem categories. Figure 19 illustrates changes over time by gambling status for Māori, Pacific people, Asian and European/Other. Further details can be found in Table 25, Appendix G.

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[9] Prevalence estimates have been age-standardised in accordance with World Health Organisation (WHO) age population distributions (Ahmad et al., 2001).

Figure 19: *Gambling status, changes over time, comparison of 2006/07 NZHS and 2011/12 NZHS, by ethnicity, total population aged 15 years and over (adjusted prevalence; 2006/07 NZHS N=12,488, 2011/12 NZHS N=12,596)[1]*
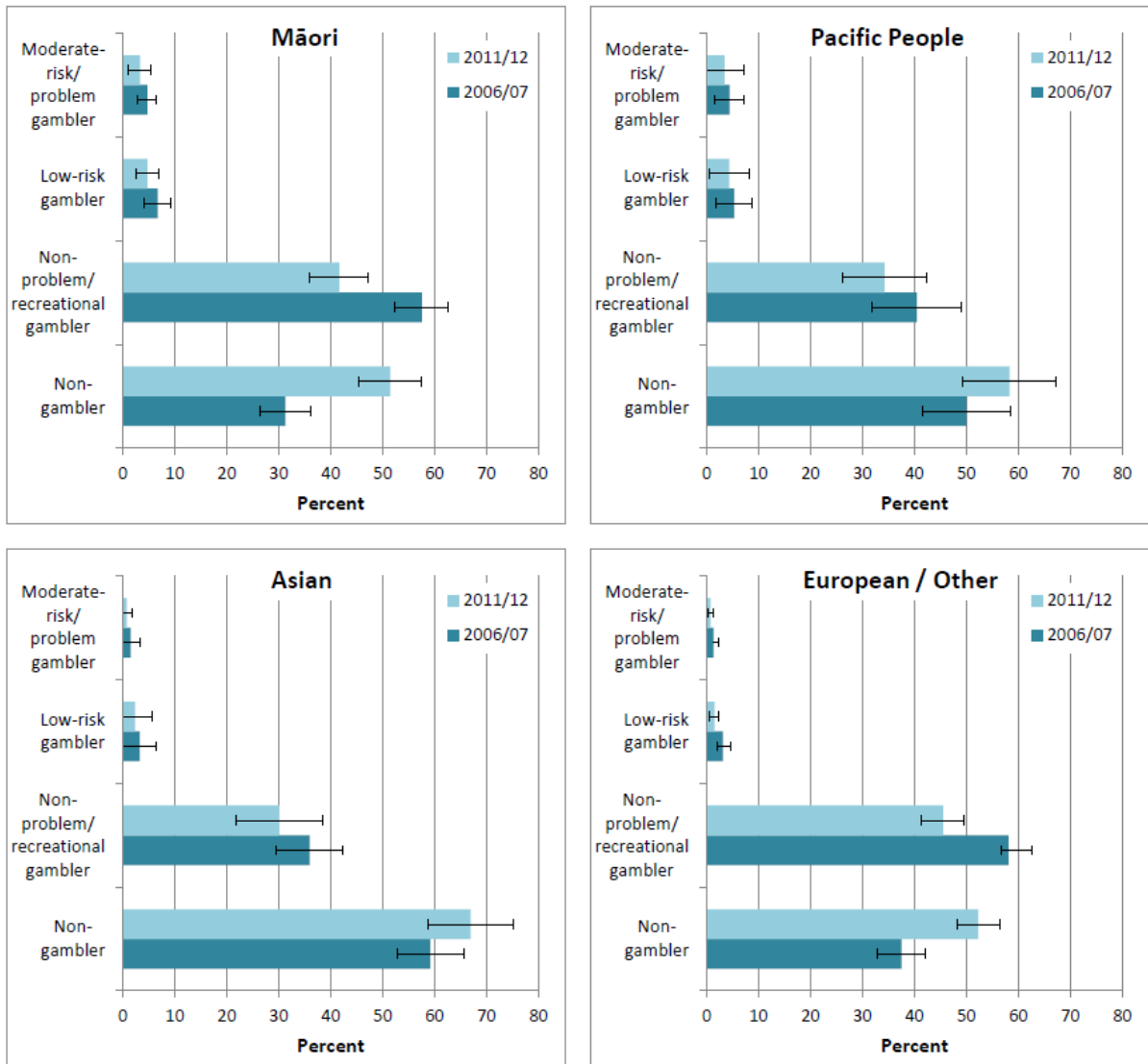
Notes:

1. Source: 2006/07 and 2011/12 New Zealand Health Surveys. NB Percentages and 95% confidence intervals have been age-standardised in accordance with World Health Organisation (WHO) age population distributions (Ahmad et al., 2001). Error bars are indicative of 95% confidence intervals.

5.2.4   By neighbourhood deprivation

Deprivation was significantly associated (p=0.0084) with problem gambling status. As illustrated in Figure 20, a very clear trend was observed between deprivation and the likelihood of moderate-risk/problem gambling; as the level of deprivation in a neighbourhood increased, so too did the likelihood of problematic gambling. People living in neighbourhoods with the highest levels of deprivation (i.e. the most deprived) were five times more likely (OR 5.0) to report moderate-risk/problem gambling than those living in neighbourhoods with the lowest levels of deprivation (i.e. the least deprived).

Figure 20:   Moderate-risk/problem gambling, by neighbourhood deprivation (NZDep2006), total population aged 15 years and over (unadjusted prevalence; N=12,594) [1]
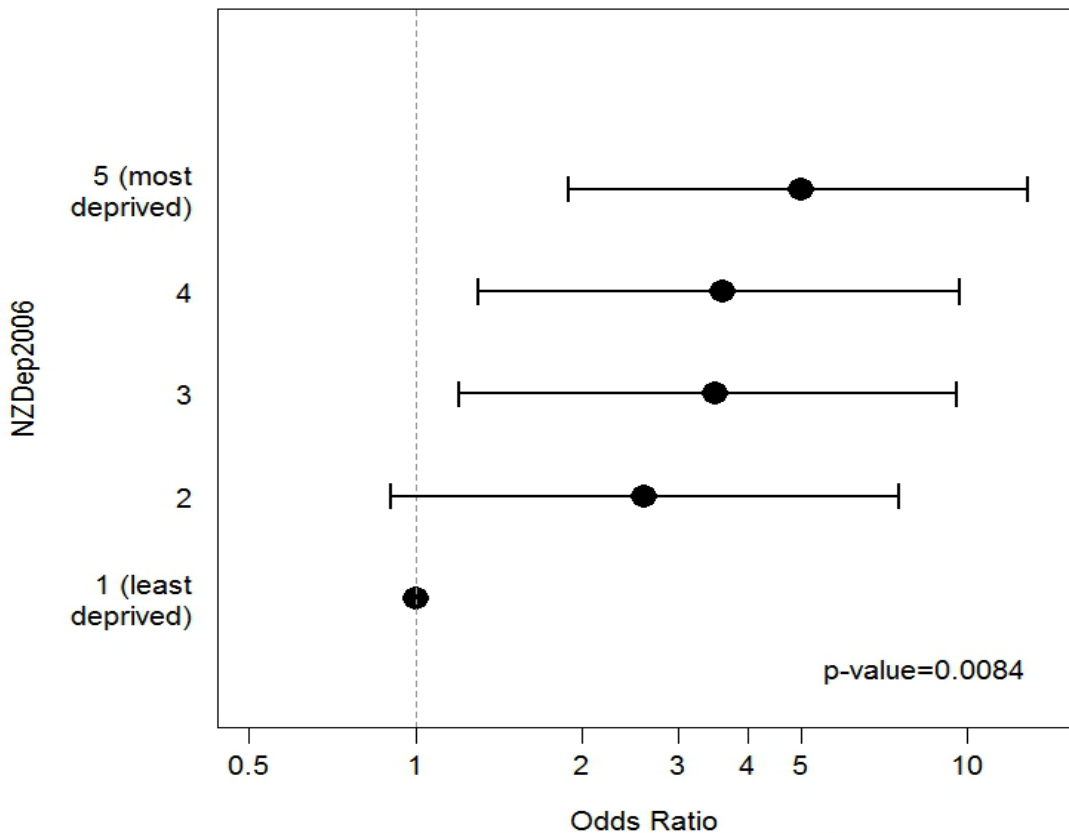
Notes:
1.   Source: 2011/12 New Zealand Health Survey. Error bars are indicative of 95% confidence intervals.

5.2.5 By geography

PGSI categorisation failed to reach significance in relation to geographic location (p=0.04) – no significant differences in problem gambling status were observed between people living in rural and urban locations.

5.3 Problem gambling – risks associated with different gambling activities

Table 13 presents participation rates for different gambling activities in the past year, by gambling status. Nearly three-quarters of moderate-risk/problem gamblers (71.2%) had gambled on an EGM (casino or non-casino) in the past 12 months. This rate steadily decreased with severity of gambling problems: 44.5% of low-risk and 14.8% of non-problem/recreational gamblers had used an EGM in the past year.

In general, there was a trend for the severity of gambling problems to increase along with rates of participation in each gambling activity. Lotto was an exception to this trend, particularly for those who had *only* played Lotto: 54.2% of non-problem/recreational gamblers indicated that they had only played Lotto, compared with 16.0% of low-risk gamblers[10].

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[10] NB: Participation rates for 'Lotto only' cannot be reported for problem/moderate-risk gamblers due to a cell size of less than 30.

Table 13: Past year participation in specific types of gambling activities, by PGSI categorisation, past-year gamblers (unadjusted prevalence; N=6,549) [1]

GAMBLING ACTIVITY [2]	GAMBLING STATUS					
	Non-problem / recreational		Low-risk		Combined moderate-risk and problem [3]	
	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)
Lotto only	3,362	54.2 (52.4 - 56.0)	53	16.0 (10.2 - 21.8)	<30	-
Any non-Lotto gambling activity	2,730	45.6 (43.9 - 47.4)	219	83.8 (78.0 - 89.7)	170	94.3 (89.8 - 98.9)
Any gaming machine (casino or non-casino)	900	14.8 (13.6 - 16.1)	120	44.5 (37.1 - 51.9)	136	71.2 (61.9 - 80.5)
Any casino gambling (tables or gaming machines)	482	9.1 (8.0 - 10.1)	65	27.3 (20.5 - 34.2)	54	32.5 (23.0 - 41.9)
Lotto (including 'Strike', 'Powerball' and 'Big Wednesday')	5,339	87.1 (85.8 - 88.3)	212	74.8 (67.9 - 81.8)	141	78.0 (70.3 - 85.7)
Instant Kiwi or other scratch tickets	1,500	24.9 (23.3 - 26.5)	101	40.0 (32.3 - 47.7)	75	44.4 (34.2 - 54.5)
Non-casino gaming machines	598	9.5 (8.5 - 10.5)	93	35.5 (28.4 - 42.7)	111	59.3 (49.6 - 69.0)
Track betting	633	10.7 (9.6 - 11.7)	66	26.8 (20.1 - 33.5)	47	23.5 (15.7 - 31.4)
Casino gaming machines	396	7.0 (6.1 - 7.8)	53	20.5 (14.4 - 26.5)	50	30.0 (20.7 - 39.2)
Sports betting	211	4.2 (3.5 - 4.9)	40	17.7 (11.1 - 24.3)	<30	-
Casino tables	144	3.3 (2.6 - 4.0)	<30	-	<30	-
Other form of gambling (including Internet-based gambling)	140	3.1 (2.4 - 3.8)	<30	-	<30	-
Keno (not in a casino)	116	1.5 (1.1 - 1.8)	<30	-	<30	-
Housie	113	1.1 (0.8 - 1.4)	<30	-	<30	-

Notes:
1. Source: 2011/12 New Zealand Health Survey.
2. Participants could choose more than one activity / response option.
3. Due to small cell sizes/denominators (n<30), the 'problem' and 'moderate-risk' categories have been combined to enable their inclusion in these analyses.

Significance testing was undertaken to examine associations between problem gambling status and participation in gambling activities (see Table 14 for odds ratios and p-values). With the exception of 'Other', significant interactions were observed between participation in each mode of gambling and severity of gambling problems. EGMs were associated with a much higher likelihood of moderate-risk/problem gambling than other activities. Moderate-risk/problem gamblers were 14 times more likely to have gambled on any EGM (casino or non-casino) (p<0.0001, OR 13.8) and 13 times more likely to have gambled on non-casino EGMs (<0.0001, OR 13.3) than non-problem/recreational gamblers.

Table 14: ***Past year participation in specific types of gambling activities, by PGSI categorisation (past-year gamblers; N=6,549) - Odds ratios and p-values [1]***

GAMBLING ACTIVITY [2]	GAMBLING STATUS			p-value [4]
	Non-problem / recreational	Low-risk	Combined moderate-risk and problem [3]	
	Odds ratio (95% CI)	Odds ratio (95% CI)	Odds ratio (95% CI)	
Lotto only	1	0.2 (0.1 - 0.3)	0.1 (0.0 - 0.1)	<0.0001
Any non-Lotto gambling activity	1	6.1 (3.9 - 9.5)	20.3 (8.4 - 49.0)	<0.0001
Any gaming machine (casino or non-casino)	1	4.5 (3.3 - 6.2)	13.8 (8.6 - 22.2)	<0.0001
Any casino gambling (tables or gaming machines)	1	3.8 (2.6 - 5.5)	5.0 (3.1 - 7.9)	<0.0001
Lotto (including 'Strike', 'Powerball' and 'Big Wednesday')	1	0.5 (0.3 - 0.7)	0.7 (0.4 - 1.2)	0.0009
Instant Kiwi or other scratch tickets	1	1.8 (1.3 - 2.6)	2.3 (1.5 - 3.7)	<0.0001
Non-casino gaming machines	1	5.0 (3.6 - 7.1)	13.3 (8.6 - 20.5)	<0.0001
Track betting	1	3.7 (2.5 - 5.5)	2.9 (1.8 - 4.7)	<0.0001
Casino gaming machines	1	3.5 (2.3 - 5.1)	5.9 (3.6 - 9.4)	<0.0001
Sports betting	1	4.8 (2.8 - 8.2)	4.7 (2.5 - 8.8)	<0.0001
Casino tables	1	2.9 (1.6 - 5.0)	3.3 (1.6 - 7.2)	<0.0001
Other form of gambling (including Internet-based gambling)	1	1.7 (0.8 - 3.7)	1.1 (0.4 - 2.9)	0.3981
Keno (not in a casino)	1	1.7 (0.8 - 3.6)	5.5 (2.8 - 10.9)	<0.0001
Housie	1	6.0 (3.3 - 11.0)	9.5 (4.2 - 21.7)	<0.0001

Notes:
1. Source: 2011/12 New Zealand Health Survey.
2. Participants could choose more than one activity / response option.
3. Due to small cell sizes/denominators (n<30), the 'problem' and 'moderate-risk' categories have been combined to enable their inclusion in these analyses.
4. Logistic regression analyses have controlled for gender, age, ethnicity, neighbourhood deprivation, and geography (urban/rural).

Figure 21 plots the odds ratios for gambling on any EGM (casino or non-casino) by gambling status. This illustrates that compared with non-problem/recreational gamblers, people who have gambled on EGMs in the past year had an increased likelihood of gambling at moderate-risk/problem (OR 13.8) and low-risk (OR 4.5) levels (p<0.0001).

Figure 21: *Gambling on any EGM (casino or non-casino), by gambling status, total population aged 15 years and over (unadjusted prevalence; N=12,594) [1]*
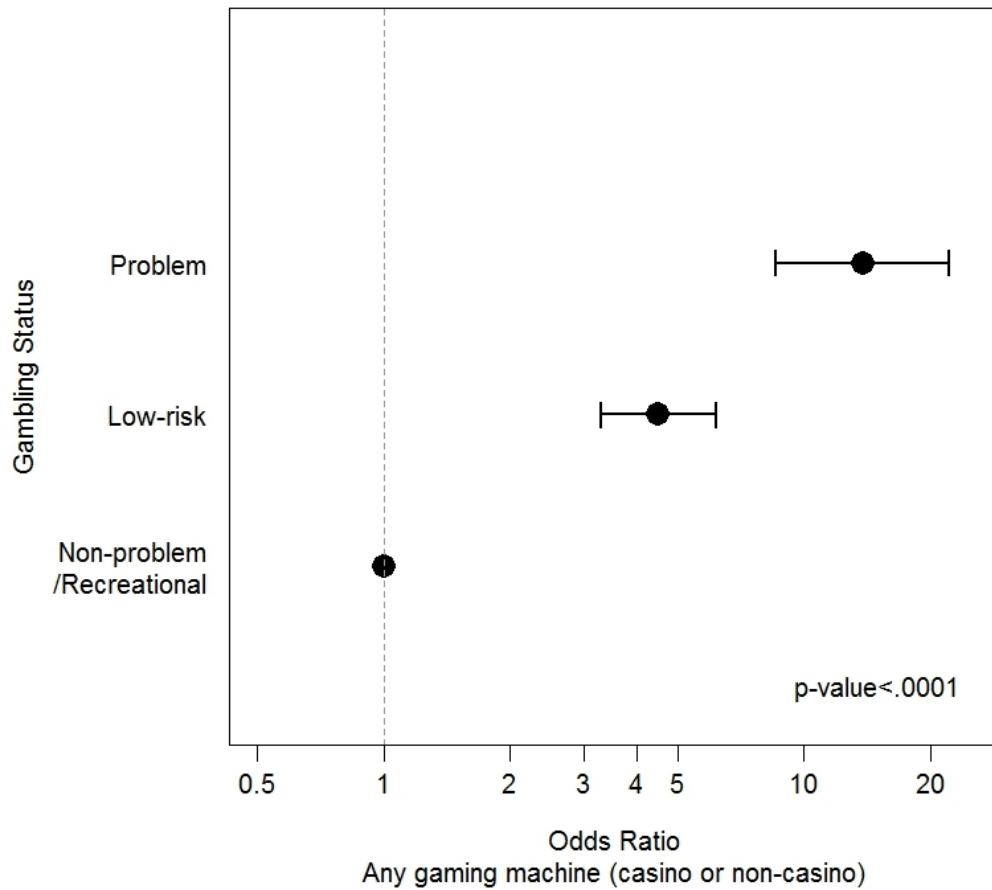
Notes:
1. Source: 2011/12 New Zealand Health Survey. Error bars are indicative of 95% confidence intervals.

5.4 Problem gambling and number of gambling activities

Figure 22 illustrates that the prevalence of gambling on 'four or more' activities increased with problem gambling severity. One-third (33.4%) of moderate-risk/problem gamblers had gambled on 'four or more' activities, compared with less than one in 20 (4.0%) non-problem/recreational gamblers. Adults who gamble at moderate-risk/problem and low-risk levels were also more likely than those who gamble at non-problem/recreational levels to have gambled on two or three activities in the past year.

*Figure 22:* *Number of gambling activities participated in during the last 12 months, by gambling status, past-year gamblers (unadjusted prevalence; N=6,549)* [1]
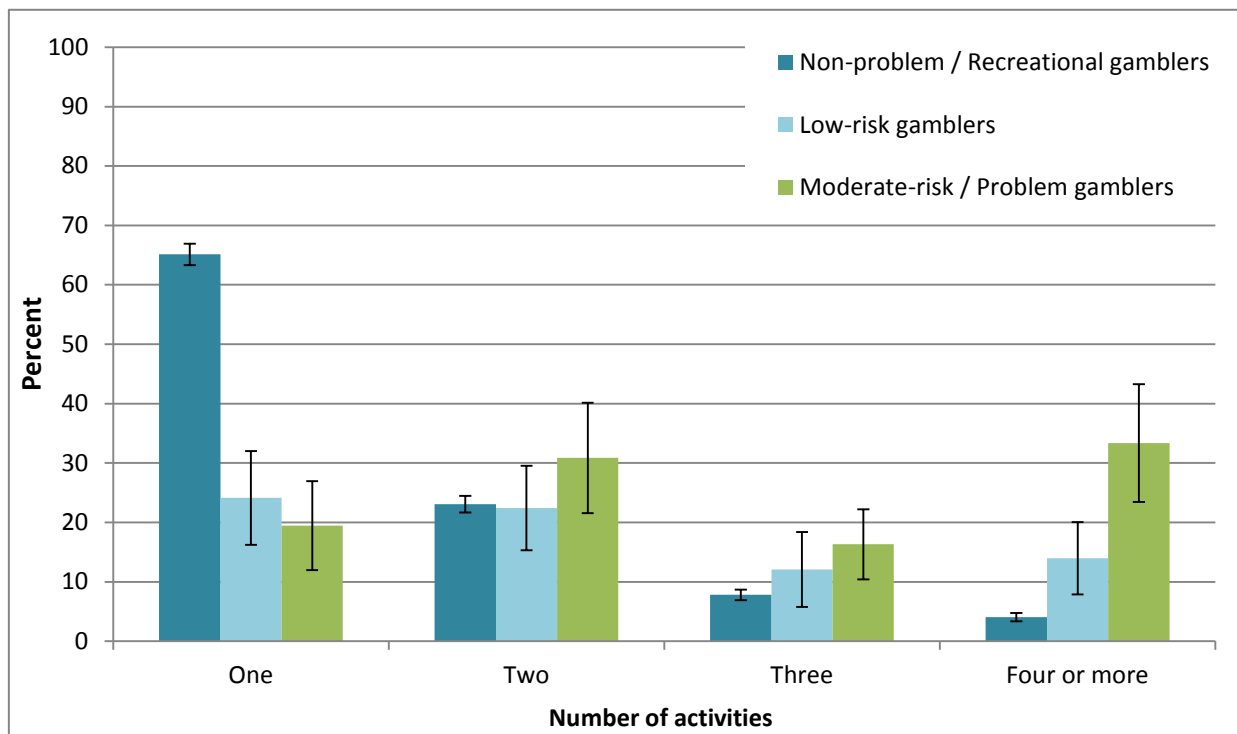
Notes:
1. Source: 2011/12 New Zealand Health Survey. Error bars are indicative of 95% confidence intervals.

Significance testing revealed that gambling status was significantly associated (p<0.0001) with the number of gambling activities participated in over the last 12 months (see Table 15). Compared with non-problem/recreational gamblers, those classified as low-risk and moderate-risk/problem gamblers were 12 (OR

12.1) and 23 (OR 22.6) times more likely (respectively), to have gambled on 'four or more' activities in the past 12 months.

Table 15: *Number of gambling activities participated in during the last 12 months, by gambling status (unadjusted prevalence; N=6,549) [1]*

GAMBLING STATUS	NUMBER OF GAMBLING ACTIVITIES IN LAST 12 MONTHS								Odds ratio (95% CI) [2]	p-value [3]
	One		Two		Three		Four or more			
	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)		
Non-problem / Recreational	4,007	65.1 (63.3 - 66.9)	1,392	23.0 (21.6 - 24.5)	469	7.8 (6.9 - 8.7)	224	4.0 (3.4 - 4.7)	1	
Low-risk	89	32.0 (24.1 - 39.9)	92	29.5 (22.4 - 36.6)	43	18.4 (12.1 - 24.8)	48	20.1 (14.0 - 26.1)	12.1 (7.9 - 18.3)	<0.0001
Moderate-risk / Problem	40	19.5 (12.0 - 26.9)	49	30.9 (21.5 - 40.2)	44	16.3 (10.4 - 22.2)	50	33.4 (23.5 - 43.2)	22.6 (13.4 - 38.1)	

Notes:
1. Source: 2011/12 New Zealand Health Survey.
2. Modelled on the probability of having gambled on four or more activities in the past year.
3. Logistic regression analyses have controlled for gender, age, ethnicity, neighbourhood deprivation, and geography (urban/rural).

5.5   SUMMARY: PROBLEMATIC GAMBLING

PGSI item endorsement and prevalence of problem gambling:

- Loss of control, feelings of guilt, and chasing losses were the most frequently endorsed items on the PGSI.

- 1.2% of the adult population satisfied the criteria for moderate-risk/problem gambling (1.0% - moderate-risk and 0.2% - problem). A further two percent satisfied the criteria for low-risk gambling.

- Significant changes were observed in the distribution of PGSI scores from the 2006/07 and 2011/12 survey waves: while very little change occurred in the prevalence of problem gambling, the proportion of non-gamblers increased and the proportions of non-problem/recreational and low-risk gamblers decreased.

Profile of people experiencing problem gambling

- Adults that satisfied the criteria for moderate-risk/problem gambling were more likely to be male, aged 25-34 or 45-54, identify as Māori or Pacific, and live in urban neighbourhoods with higher levels of deprivation.

Problem gambling – risks associated with different gambling activities

- There was an overall trend for the severity of gambling problems to increase along with rate of participation in each gambling activity.

- EGMs were associated with the highest risk of problematic gambling. Moderate-risk/problem gamblers were 14 times more likely to have gambled on any EGM and 13 times more likely to have gambled on non-casino EGMs than non-problem/recreational gamblers.

Problem gambling and number of gambling activities

- The prevalence of gambling on 'four or more' activities increased significantly with problem gambling severity:

  o One-third (33%) of moderate-risk/problem gamblers had gambled on 'four or more' activities, compared with less than one in 20 (4%) non-problem/recreational gamblers.

  o Compared with non-problem/recreational gamblers, low-risk and moderate-risk/problem gamblers were 12 (OR 12.1) and 23 (OR 22.6) times more likely (respectively), to have gambled on 'four or more' activities in the past 12 months.

Problematic gambling: Comparison of 2011/12 NZHS and the 2012 National Gambling Study

- This study found that three percent, or an estimated 112,800 adults, were experiencing some level of harm and/or negative consequences as a result of their gambling; just over one percent satisfied the PGSI past-year criteria for moderate-risk/problem gambling (1.0% - moderate-risk and 0.2% - problem) and a further two percent satisfied the criteria for low-risk gambling. These estimates are lower than those obtained by the National Gambling Study, which estimates that 2.5% of adults are moderate-risk/problem gamblers (1.8% moderate-risk, 0.7% problem gambling) and a further five percent satisfy the criteria for low-risk gambling.

- Adults that satisfied the criteria for moderate-risk/problem gambling were more likely to be male, aged 25-34 or 45-54, identify as Māori or Pacific, and live in urban neighbourhoods with higher levels of deprivation.

This is largely congruent with other research, although the National Gambling Study did not find any significant age differences.

- There was evidence that problem gamblers have a greater overall involvement in gambling; the prevalence of problem gambling increased along with the number of activities that adults had gambled on. A relationship between a greater number of gambling activities and an increased risk of problem gambling was also observed in the National Gambling Study.

6. RESULTS: ECOLOGICAL FACTORS AND PROBLEMATIC GAMBLING

The New Zealand Health Survey gathers information on a wide range of topics that relate to the health and wellbeing of the population. In 2011/12, the domains covered by the NZHS included: health status, long-term health conditions, behaviours and risk factors, nutrition, mental health, oral health, health service utilisation, patient experience; and, socio-demographics.

NZHS topic domains with ecological relevance to gambling and problem gambling were identified in accordance with a review of the literature and guidance from the project's advisory group. Items with the potential to fulfil risk or protective functions were retained for analysis and key results for each of these topics are presented in the following four sections:

- Socio-demographics and gambling;

- Other dangerous consumptions and gambling;

- Health and gambling; and,

- Use of health services and gambling.

6.1   Socio-demographics and gambling

Associations between gambling status and education, employment, length of time living in New Zealand (for those born outside of New Zealand), and living in Christchurch at the time of the major earthquake (22 February, 2011) were investigated. No significant trends or associations were observed between these socio-demographic indicators and gambling status. However, while not significant, there was a general trend for the prevalence of problematic gambling to increase along with the length of time lived in New Zealand: greater proportions of people who had lived in New Zealand for six or more years were experiencing some gambling related harm (low-risk, combined moderate-risk/problem) compared with those who had been here for less than five years. Table 26 and Table 27 (Appendix H) provide detailed results on these items.

6.2 Other dangerous consumptions and gambling

Analyses were undertaken to explore relationships between gambling and respondents' use of alcohol, tobacco and other drugs. The following sections provide an overview of the results from this set of analyses.

6.2.1 Alcohol

Alcohol use and hazardous drinking were assessed by the 10-item Alcohol Use Disorders Identification Test (AUDIT). The AUDIT assesses three domains: alcohol consumption (questions 1-3); dependence (questions 4-6); and, adverse consequences (questions 7-10). The score for each question can range between zero and four with total scores ranging between zero and 40. Hazardous drinking has been defined as a score of eight or more, while a score of 13 or more is indicative of alcohol dependence (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001).

Three measures of alcohol use were analysed with regard to gambling behaviour: use of alcohol in the past year, hazardous drinking and alcohol dependence. Significant findings are discussed below, while further details can be found in Appendix I.

6.2.1.1 Use of alcohol in the past year

Problem gambling was significantly associated with use of alcohol in the last 12 months (p=0.0051); compared with people with no gambling problems, low-risk gamblers (OR 1.9) and moderate-risk/problem gamblers (OR 1.6) were more likely to report alcohol use. While this relationship is statistically significant, it should be noted that the 95% confidence intervals for these items do overlap and that the p-value is not as strong as those observed for some other relationships (e.g. p<0.0001); this item should be treated with caution. See Table 28 and Table 29 in Appendix I for further details.

A significant association was also observed between gender and use of alcohol, with males being almost twice as likely as females to report using alcohol in the past year (p<0.0001; OR 1.9, 1.7 – 2.2).

6.2.1.2   Hazardous drinking behaviour

Approximately 15% of the general population reported using alcohol at hazardous levels, and the prevalence of hazardous drinking rose steadily with severity of gambling problems: one-third of low-risk (33.4%), and one-half of moderate-risk/problem (50.6%) gamblers reported hazardous patterns of alcohol use (see Figure 23). This association was found to be significant (p<0.0001), with low-risk gamblers being nearly three times (OR 2.8) and moderate-risk/problem gamblers being almost five times (OR 4.7) more likely than those with no gambling related problems to report hazardous drinking behaviour (see Table 29, Appendix I).

As shown in Figure 23, significant gender effects were also observed in relation to gambling and hazardous alcohol use (p<0.0001).   Males were three times (OR 3.1) more likely than females to report hazardous drinking.   Males who were classified as non-gamblers, non-problem/recreational gamblers and low-risk gamblers were significantly more likely than their female counterparts to report hazardous drinking.

Figure 23:   Prevalence of hazardous drinking by gambling status and gender, total population aged 15 years and over (unadjusted prevalence; N=12,392) [1]
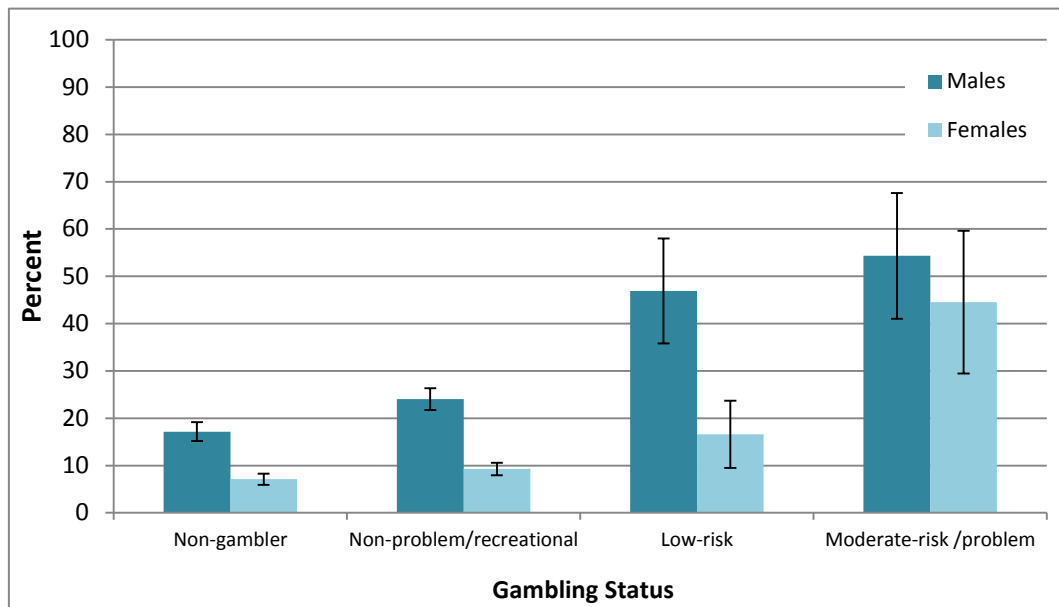
Notes:
1.   Source: 2011/12 New Zealand Health Survey. Error bars are indicative of 95% confidence intervals.

6.2.1.3 Alcohol dependence

Approximately five percent (4.8%) of the total adult population satisfied the AUDIT criteria for alcohol dependence. This rose to 10.7% for low-risk and 29.2% for moderate-risk/problem gamblers (see Table 28, Appendix I). Significance testing revealed that alcohol dependence was more prevalent amongst males (p<0.0001). The odds of alcohol dependence increased significantly with gambling severity (p<0.0001): compared to people with no gambling problems, at-risk gamblers were twice (OR 2.0) and moderate-risk/problem gamblers six (OR 6.3) times more likely to report issues with alcohol dependence (see Table 29, Appendix I).

6.2.2 Smoking

The prevalence of current smoking in the total adult population was 18.4%. Figure 24 shows that the prevalence of smoking increased steadily with problem gambling severity, for both males and females: 18.5% of non-problem/recreational, 42.8% of low-risk and 57.0% of moderate-risk/problem gamblers were current smokers. The association between current smoking and gambling status was significant (p<0.0001), with low-risk and moderate-risk/problem gamblers being more likely (OR 3.0 and OR 4.2 respectively) than people with no gambling problems to be current smokers. See Appendix I (Table 28 and Table 29) for further details.

Figure 24:   *Prevalence of current smoking by gambling status and gender, total population aged 15 years and over (unadjusted prevalence; N=12,559)* [1]
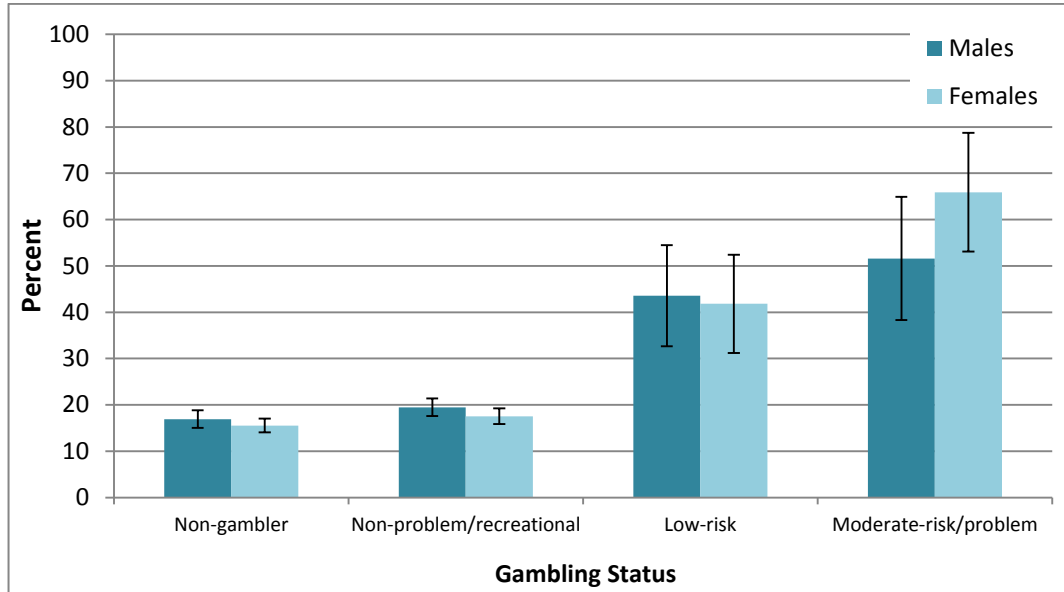
Notes:
1.   Source: 2011/12 New Zealand Health Survey. Error bars are indicative of 95% confidence intervals.

6.2.3   Drug use

Respondents were asked "Apart from alcohol and tobacco, in the last 12 months have you used any drugs for recreational purposes or to get high?"   The overall rate of drug use (i.e. having used 'any drug' in the past year) in the total adult population was 8.9% and rose to 21.5% for low-risk and 31.4% for moderate-risk/problem gamblers. The relationship between overall drug use and gambling was significant ($p<0.0001$), with low-risk gamblers being three (OR 2.7) and moderate-risk/problem gamblers being four (OR 3.7) times more likely than people with no gambling problems to have used drugs.

Those who responded affirmatively to using drugs in the past year were then asked to specify which drugs they had used. Cannabis was the most commonly cited drug: 8.1% of the total adult population had used cannabis in the last 12 months, compared to 19.9% for low-risk and 25.0% for moderate-risk/problem gamblers. Use of cannabis was significantly associated with the severity of gambling problems ($p<0.0001$): compared with

people with no gambling problems, both low-risk and moderate-risk/problem gamblers were more than two and a half times as likely to have used cannabis in the past 12 months (OR 2.6 and OR 2.7 respectively).

Figure 25 illustrates the increasing prevalence of drug and cannabis use with increasing severity of gambling problems.

Figure 25: *Prevalence of drug use by gambling status, total population aged 15 years and over (unadjusted prevalence; N=12,596) [1]*
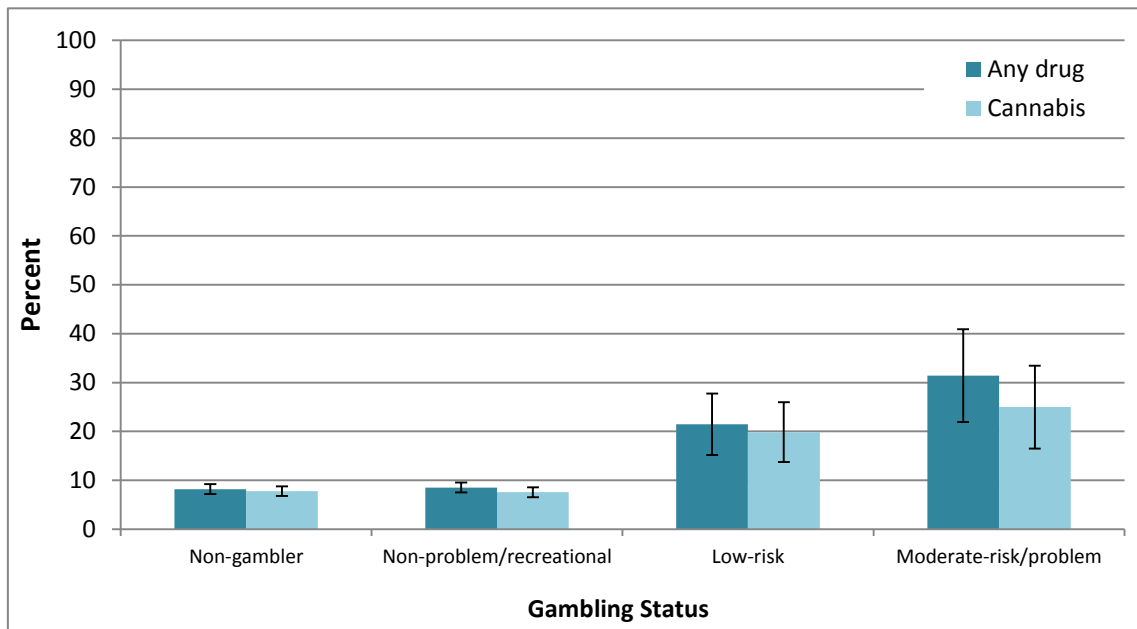
Notes:
1.   Source: 2011/12 New Zealand Health Survey.   Error bars are indicative of 95% confidence intervals.

There was also a significant relationship between use of other drugs[11] and gambling status (p<0.0001). Compared with adults with no gambling problems, low-risk and moderate-risk/problem gamblers were nearly three (OR 2.7) and seven (OR 6.9) times more likely to have used other drugs in the last year.

Males were also significantly more likely than females to report overall drug use, cannabis use and use of other drugs (p<0.0001). Further details on this set of analyses can be found in Appendix I (Table 28 and Table 29).

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[11] 'Other' drugs include: Ecstasy; Amphetamines, Legal party pills, Stimulants, Painkillers, Benzodiazepines, Hallucinogens, Cocaine, Heroin, Other.

6.3   Health and gambling

Three areas of health-related information were selected for analysis in relation to gambling. These include measures of self-rated health and psychological distress, and diagnoses of common mental health disorders by a doctor. Results for each of these areas are outlined in the following sections, with further details being available in Appendix J.

6.3.1   SF-12 Health Survey

Self-rated health was measured by the Short Form Health Survey (SF-12); a multipurpose 12 question survey that provides a generic measure of an individual's health and wellbeing over the past four weeks. The SF-12 is based on the original and much longer SF-36, takes approximately two minutes to administer and has demonstrated good psychometric qualities (Gandek et al., 1998; Ware, Kosinki, & Keller, 1996; Ware, Kosinki, Turner-Bowker, & Gandek, 2002). The SF-36 is the most widely used health survey throughout the world and has been used to measure and monitor health outcomes in both general and specific populations (Ware et al., 2002). The SF-36 and SF-12 both gather information on eight health dimensions (outlined in Table 16), with scores being transformed into a 0-100 scale. Interpretation of the SF-12 is based on the mean scores for each domain, with lower scores being indicative of more disability and higher scores with less disability: a score of zero is equivalent to maximum disability and a score of 100 is equivalent to no disability in the specified domain. The domains are independent of each other and domain scores cannot be compared. However, scores for different sub-populations can be compared for each domain (e.g. 'physical functioning' by gambling status).   Scores have been calculated using New Zealand-specific population norms (Frieling, Davis, & Chiang, 2013).

Table 16:   SF-12 domains and guide to interpretation [1]

Code	Domain	Low score interpretation	High score interpretation
PF	Physical functioning	Limited a lot in performing all physical activities, including self-care, due to health	Performs all types of physical activities, including the most vigorous, without limitations due to health
RP	Role limitation – physical	Limited a lot in work or other daily activities as a result of physical health	No problems with work or other daily activities as a result of physical health
BP	Bodily pain	Very severe and extremely limiting bodily pain	No pain or limitations due to pain
GH	General health perceptions	Evaluates own health as poor and believes it is likely to get worse	Evaluates own health as excellent
VT	Vitality	Feels tired and worn out all of the time	Feels full of energy all of the time
SF	Social functioning	Extreme and frequent interference with normal social activities due to physical or emotional problems	Performs normal social activities without interferences due to physical or emotional problems
RE	Role limitation – emotional	Problems with work or other daily activities as a result of emotional problems	No problems with work or other daily activities as a result of emotional problems
MH	Mental health	Has feelings of nervousness and depression all of the time	Feels peaceful, happy and calm all of the time
PCS	Physical Component Summary	Poorer physical health	Better physical health
MCS	Mental Component Summary	Poorer mental health	Better mental health

Notes:
1. Source: Based on Ministry of Health (2009, p. 72). NB: A four-week recall period is used in all domains, except GH, which specifies an 'in general' recall period.

Figure 26 illustrates the mean scores for each of the SF-12 health domains by gambling status (non-gamblers, non-problem/recreational, low-risk, moderate-risk/problem). The ordering of the domains used in Figure 26 is in accordance with an international standard, whereby the order from left to right represents the extent to which each scale measures physical health (closer to the left) or mental health (closer to the right) (Ministry of Health, 2009). It is apparent that people with increased severity of gambling problems had lower levels of functioning in all health domains. While this trend was not so strong for the physical functioning (PF) domain, it was particularly strong for the domains of general health (GH), vitality (VT), social functioning (SF), role limitation – emotional (RE), and mental health (MH). A trend was also observed in relation to gambling status

and Summary Physical (SPH) and Mental (SMH) Health scores: people with increasing severity of gambling problems were more likely to report lower SPH and SMH scores. Further details are available in Appendix J (Table 30 and Table 31).

Figure 26: Mean SF-12 scores by gambling status, total population aged 15 years and over (unadjusted prevalence; N=12,596) [1]
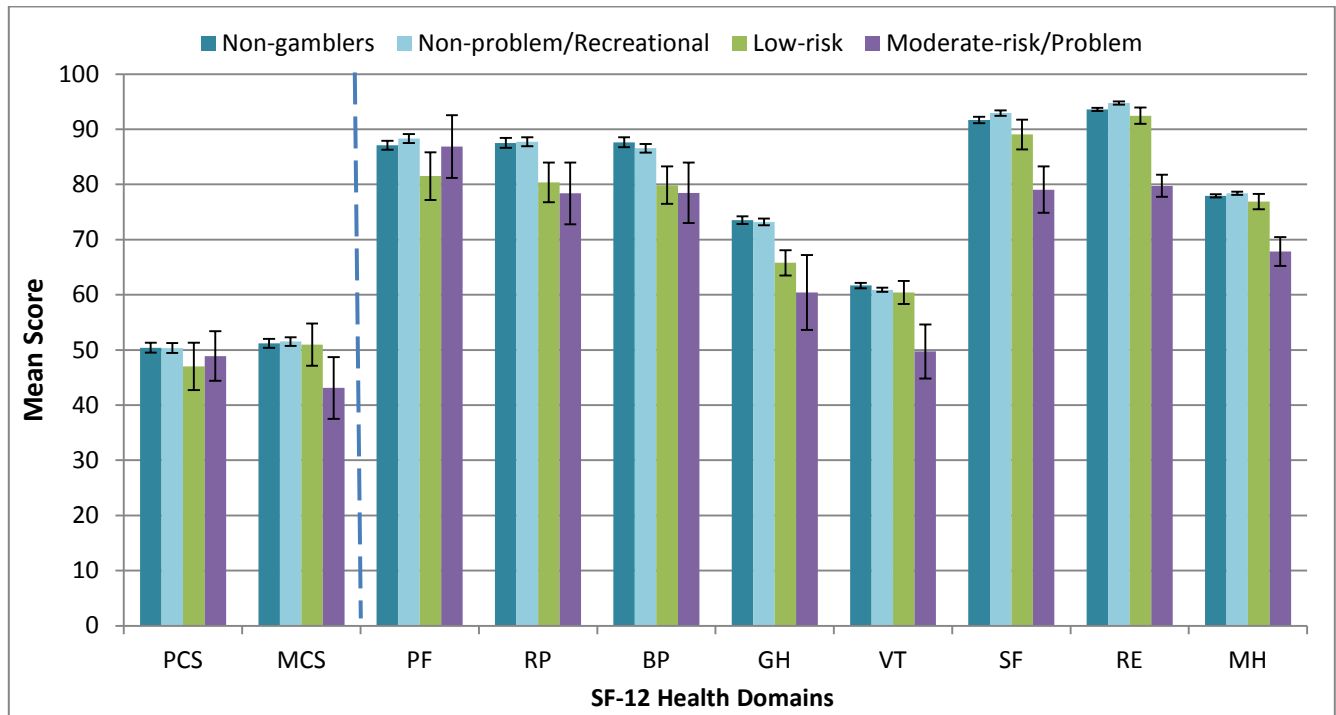
Notes:
1.   Source: 2011/12 New Zealand Health Survey. Error bars are indicative of 95% confidence intervals.

6.3.2   Self-rated health

Respondents were also asked "How would you rate your health? Excellent, very good, good, fair or poor?" This measure of self-rated health was significantly associated with gambling status (p=0.0003). As shown in Figure 28, greater proportions of low-risk (14.6%) and moderate-risk/problem (27.0%) gamblers rated their health as being fair or poor in comparison to those with no gambling problems (10.2%) and those who did not gamble (10.6%). Moderate-risk/problem gamblers were 2.5 times more likely (OR 2.5) to report fair or poor

health than those with no gambling problems. No gender differences were observed in relation to self-rated health. Further details can be found in Appendix J (Table 30 and Table 31).

Figure 27: *Fair or poor general health by gambling status, total population aged 15 years and over (unadjusted prevalence; N=12,576)* [1]
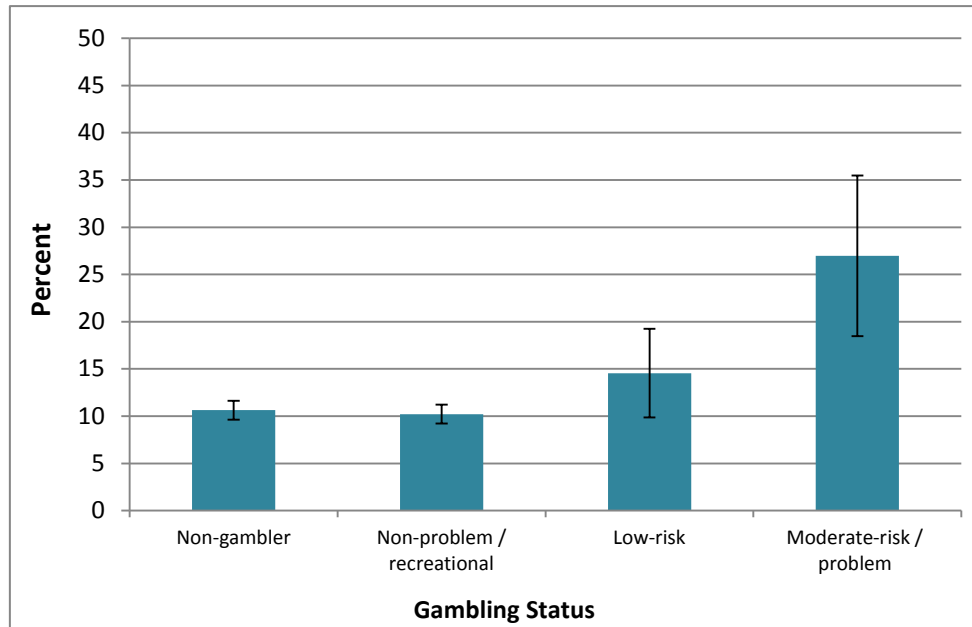
Notes:
1. Source: 2011/12 New Zealand Health Survey. Error bars are indicative of 95% confidence intervals.

6.3.3   Psychological distress

The Kessler 10-item Psychological Distress Scale (K10) was included in the NZHS to provide a measure of non-specific psychological distress. The K10 is an internationally validated instrument that is highly correlated with anxiety and depressive disorders (Andrews & Slade, 2001). Scores range from ten to 50, with a score of 12 or more being indicative of a high/very high probability of an anxiety or depressive disorder.

A significant association was observed between gambling status and a high/very high probability of an anxiety or depressive disorder ($p<0.0001$). While less than six percent of non-gamblers (5.8%) and non-problem/recreational gamblers (4.6%) were likely to have an anxiety or depressive disorder, this rose to 11.7% for low-risk gamblers and 28.2% for moderate-risk/problem gamblers (see Figure 28). The odds of an anxiety or depressive disorder rose with gambling symptom severity: low-risk gamblers were twice as likely (OR 2.1)

and moderate-risk/problem gamblers were nearly six times as likely (OR 5.7) as adults with no gambling problems to have an anxiety or depressive disorder. Females were significantly more likely than males to have a high or very high likelihood of an anxiety or depressive disorder (p=0.0001). Further details can be found in Appendix J (Table 30 and Table 31).

Figure 28: *High or very high probability of anxiety or depression by gambling status, total population aged 15 years and over (unadjusted prevalence; N=12,564) [1]*
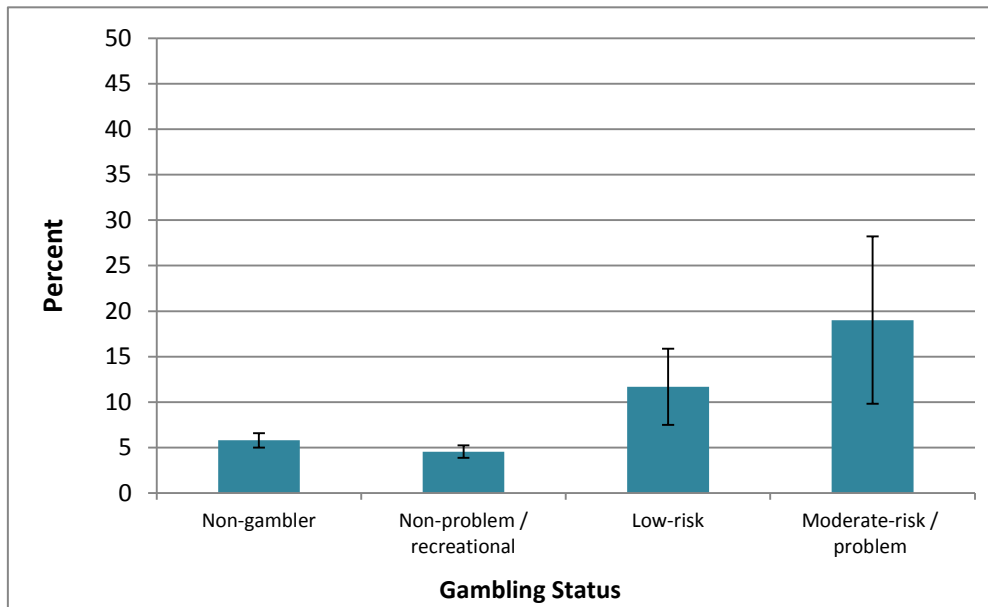
Notes:
1. Source: 2011/12 New Zealand Health Survey. Error bars are indicative of 95% confidence intervals.

6.3.4   Diagnosis of a common mental health disorder by a doctor

Participants were asked the following questions concerning the diagnosis of common mental health disorders by a doctor:

- "Have you ever been told by a doctor that you have depression?"

- "Have you ever been told by a doctor that you have bipolar disorder, which is sometimes called manic depression?"

- "Have you ever been told by a doctor that you have anxiety disorder? This includes panic attacks, phobia, post-traumatic stress disorder and obsessive compulsive disorder."

Less than one-in-five adults in the total population (16.2%) had been diagnosed by a doctor with one or more of these mental health issues, compared with nearly one-third (30.2%) of moderate-risk/problem gamblers (see Figure 29). A similar pattern was observed for depression: 14.2% of the total population had been diagnosed with depression by their GP, compared with 29.5% of moderate-risk/problem gamblers (see Figure 29). Females were significantly more likely than males to report that they had been diagnosed with any common mental disorder and/or depression by a doctor. Detailed results are available in Appendix J, Table 30.

Figure 29: *Common mental disorder by gambling status, total population aged 15 years and over (unadjusted prevalence; N=12,557)* [1]
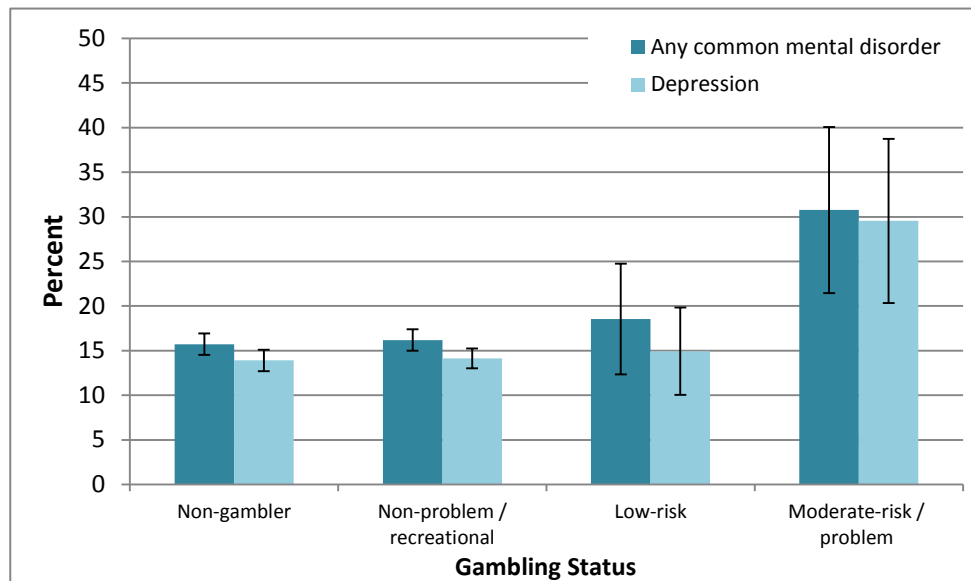
Notes:
1. Source: 2011/12 New Zealand Health Survey. Error bars are indicative of 95% confidence intervals.

Significance testing revealed an association between gambling status and a diagnosis of 'any common mental disorder' and depression. The likelihood of these issues increased with the severity of gambling problems:

- Moderate-risk/problem (OR 2.7) gamblers were significantly more likely to be diagnosed with any common mental disorder than those with no gambling problems (p<0.0001); and,

- Moderate-risk/problem (OR 3.0) gamblers were significantly more likely to be diagnosed with depression than those with no gambling problems (p<0.0001).

See Table 31 (Appendix J) for further details on this set of analyses.

6.4 Use of health services and gambling

This section outlines results relating to the use of health services according to gambling status. Three aspects of health service use were investigated: Use of a general practitioner (GP); Un-met needs by general practitioners; and, Use of other health services.

6.4.1 General practitioner use

Respondents were asked "In the past 12 months, have you seen a GP, or been visited by a GP, about your own health? By health, I mean your mental and emotional health as well as your physical health." Figure 30 illustrates the proportion of adults who had visited a GP by gambling status: 75.6% of non-gamblers, 81.2% of non-problem/recreational, 77.8% of low-risk and 84.6% of moderate-risk/problem gamblers (see Appendix K, Table 32 for further details).

Figure 30:   Past-year use of a GP by gambling status, total population aged 15 years and over (unadjusted prevalence; N=12,574) [1]
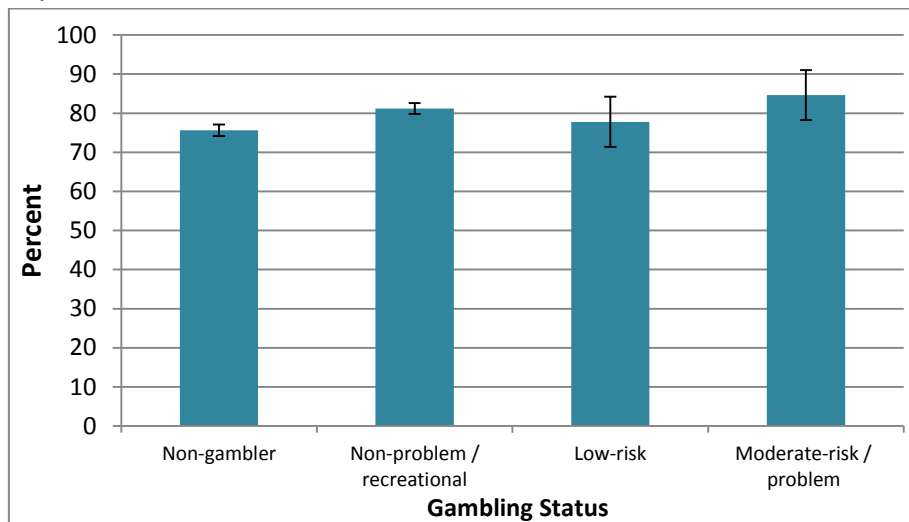
Notes:
1. Source: 2011/12 New Zealand Health Survey. Error bars are indicative of 95% confidence intervals.

The association between gambling status and past-year visits to a GP was significant (p=0.0161), with moderate-risk/problem gamblers being twice (OR 2.0) as likely as those with no gambling problems to have consulted a GP (see Appendix K, Table 33).

6.4.2   General practitioner use - unmet needs

The topic of unmet health needs was measured by the following question: "In the last 12 months, has there been any time when you <u>needed</u> to see a GP about your <u>own</u> health, but didn't get to see any doctor at all?" As shown in Figure 31, less than ten percent of non-gamblers (8.1%) and non-problem/recreational gamblers (8.5%) said 'yes' to this item, compared with approximately one-fifth of low-risk and moderate-risk/problem gamblers (17.1% and 22.0% respectively). There was a significant association (p<0.0001) between unmet health needs and gambling: compared to those with no gambling problems, low-risk gamblers were twice as likely (OR 2.1) and moderate-risk/problem gamblers were two and a half times as likely (OR 2.6) to report unmet health needs (see Appendix K, Table 33).

Females were significantly more likely to indicate that they had unmet health needs than males (p<0.0001).

Figure 31:   Unmet health needs by gambling status, total population aged 15 years and over (unadjusted prevalence; N=12,575) [1]
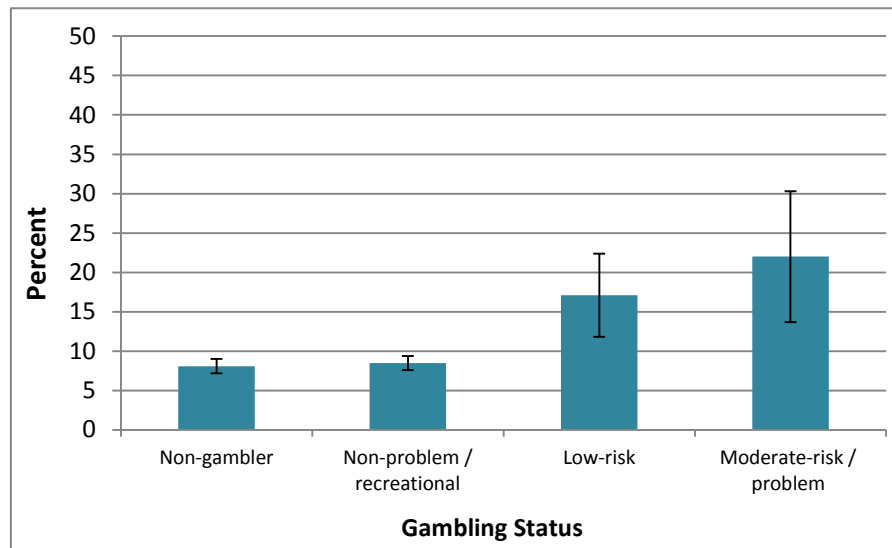
Notes:
1.   Source: 2011/12 New Zealand Health Survey. Error bars are indicative of 95% confidence intervals.

6.4.2.1 General practitioner - unmet needs due to cost

Respondents were also asked "The last time you were not able to see a GP when you needed to, what was the reason?" Figure 32 shows the distribution of people who had not seen a GP because it "costs too much", by gambling status.

Figure 32: Unmet health needs <u>due to cost</u>, by gambling status, total population aged 15 years and over (unadjusted prevalence; N=12,587) [1]
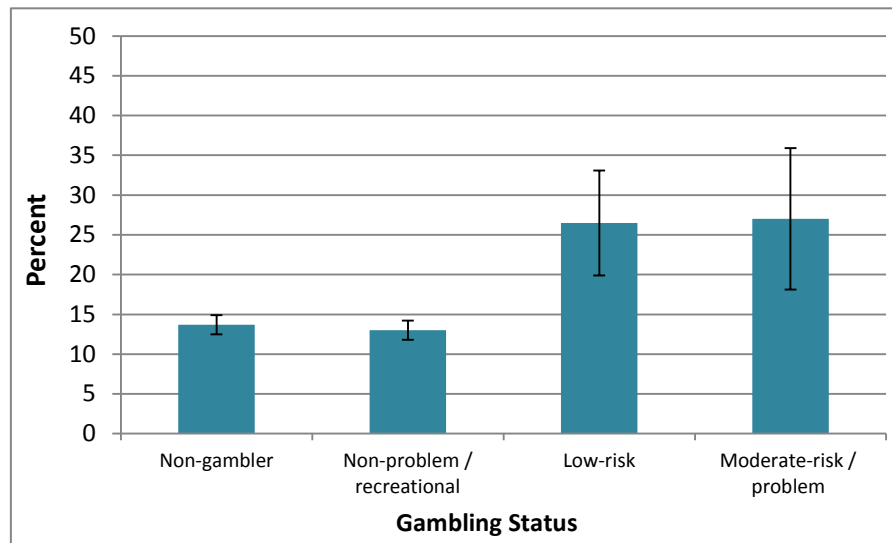
Notes:
1. Source: 2011/12 New Zealand Health Survey. Error bars are indicative of 95% confidence intervals.

Compared with non-gamblers and non-problem/recreational gamblers, significantly greater proportions of low-risk and moderate-risk/problem gamblers had not seen a GP due to cost (p<0.0001). Low-risk and moderate-risk/problem gamblers were twice as likely (OR 2.1 and OR 1.9 respectively) as those with no gambling problems to report that they had not seen a GP due to the cost. Females were significantly more likely to respond affirmatively to this item than males (p<0.0001).

6.4.3 Use of other health professionals

Approximately four percent (3.9%) of the total adult population had seen a psychologist, counsellor or social worker in the past 12 months. As illustrated in Figure 33, the proportion of adults that had seen another health professional in the past 12 months rose to 5.5% for low-risk and 12.5% for moderate-risk/problem gamblers. This association was significant (p=0.0002), with moderate-risk/problem gamblers being three and a half times more likely (OR 3.4) than those with no gambling problems to have sought professional help in the past 12 months. Females were significantly more likely than males to have seen a psychologist, counsellor or social worker in the past 12 months (p=0.0001).

Detailed results for this set of analyses can be found in Appendix K (Tables 32 and 33).

Figure 33: Seen a psychologist, counsellor or social worker in the past 12 months, by gambling status, total population aged 15 years and over (unadjusted prevalence; N=12,594) [1]
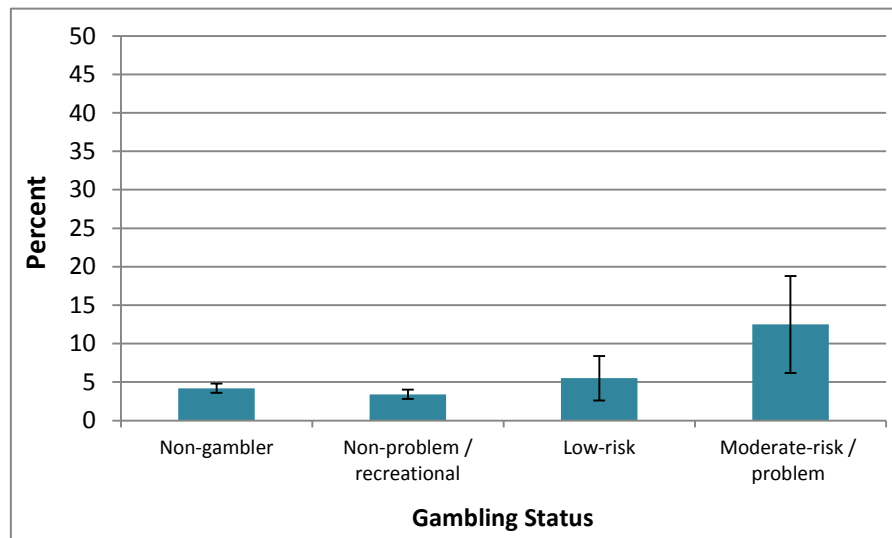
Notes:
1. Source: 2011/12 New Zealand Health Survey. Error bars are indicative of 95% confidence intervals.

6.5   SUMMARY: ECOLOGICAL FACTORS AND PROBLEMATIC GAMBLING

Socio-demographics and gambling:

- No significant trends or associations were observed between gambling status and education, employment, length of time living in New Zealand (for those born outside of New Zealand), and living in Christchurch at the time of the major earthquake (22 February, 2011).

Other dangerous consumptions and gambling:

- Alcohol:

  - *Use of alcohol:* Problem gambling was significantly associated with use of alcohol in the last 12 months. Compared to people with no gambling problems, low-risk gamblers (OR 1.9) and moderate-risk/problem gamblers (OR 1.6) were more likely to report alcohol use.

  - *Hazardous drinking behaviour:* Approximately 15% of the general population reported using alcohol at hazardous levels (score of eight or more on the AUDIT) compared with one-third of low-risk (33%), and one-half of moderate-risk/problem (51%) gamblers. Hazardous drinking behaviour was significantly associated with severity of gambling: low-risk (OR 2.8) and moderate-risk/problem (OR 4.7) gamblers were more likely than people with no gambling problems to report hazardous drinking behaviour.

  - *Alcohol dependence:* Alcohol dependence (score of 13 or more on the AUDIT) was significantly associated with severity of gambling. While five percent of the total adult population satisfied the AUDIT criteria for alcohol dependence, this rose to 10.7% for low-risk and 29.2% for moderate-risk/problem gamblers. Low-risk gamblers were twice (OR 2.0) and moderate-risk gamblers six (OR 6.3) times as likely as those with no gambling problems to satisfy criteria for alcohol dependence.

- Smoking:

  o The association between current smoking and gambling status was significant. Low-risk gamblers were three (OR 3.0) and moderate-risk/problem gamblers four (OR 4.2) times more likely than people with no gambling problems to be current smokers.

- Drug use:

  o The relationship between overall drug use and gambling was significant: low-risk gamblers were three (OR 2.7) and moderate-risk/problem gamblers four (OR 3.7) times more likely than people with no gambling problems to have used other drugs in the past year.

  o Use of cannabis was significantly associated with the severity of gambling problems: compared with people with no gambling problems, both low-risk and moderate-risk/problem gamblers were more than two and a half times as likely to have used cannabis in the past 12 months (OR 2.6 and OR 2.7 respectively).

  o There was a significant relationship between use of other drugs and gambling status. Compared with adults with no gambling problems, low-risk and moderate-risk/problem gamblers were nearly three (OR 2.7) and seven (OR 6.9) times more likely to have used other drugs in the last year.

Health and gambling:

- Self-rated health:

  o People with increased severity of gambling problems reported lower levels of functioning in all of the SF-12 health domains. This trend was particularly strong for the domains of general health (GH), vitality (VT), social functioning (SF), role limitation – emotional (RE), and mental health (MH). A trend was also observed in relation to gambling status and Summary Physical (SPH) and Mental (SMH) Health scores: respondents with increasing severity of gambling problems were more likely to report lower levels of functioning in these summary domains.

- o Gambling status was significantly associated with fair/poor self-rated health. Moderate-risk/problem gamblers were 2.5 times more likely (OR 2.5) to report fair or poor health than those with no gambling problems.

- Psychological distress:

  - o A significant association was observed between gambling status and a high/very high probability of an anxiety or depressive disorder. The odds of an anxiety or depressive disorder rose with gambling symptom severity: low-risk gamblers were twice as likely (OR 2.1) and moderate-risk/problem gamblers were nearly six times as likely (OR 5.7) as adults with no gambling problems to have an anxiety or depressive disorder.

- Diagnosis of a common mental health disorder by a doctor:

  - o Gambling status was significantly associated with a diagnosis of any common mental disorder (i.e. depression, bipolar disorder or anxiety disorder) and a diagnosis of depression. The likelihood of these issues increased with the severity of gambling problems:

    - ▪ Moderate-risk/problem gamblers were nearly three times (OR 2.7) more likely than those with no gambling problems to be diagnosed with any common mental disorder; and,

    - ▪ Moderate-risk/problem gamblers were three times (OR 3.0) more likely than those with no gambling problems to be diagnosed with depression.

Use of health services and gambling:
- General practitioner (GP) use:

  - o The association between gambling status and past-year visits to a GP was significant, with moderate-risk/problem gamblers being twice (OR 2.0) as likely as those with no gambling problems to have consulted a GP.

- General practitioner use – unmet needs:

  o There was a significant association between unmet health needs (not being able to see a GP when they needed to) and gambling: compared to those with no gambling problems, low-risk gamblers were twice as likely (OR 2.1) and moderate-risk/problem gamblers were two and a half times as likely (OR 2.6) to report unmet health needs.

  o The relationship between gambling status and having unmet health needs <u>due to cost</u> was also significant. Low-risk and moderate-risk/problem gamblers were twice as likely (OR 2.1 and OR 1.9 respectively) as those with no gambling problems to report that they had not seen a GP due to the cost.

- Use of other health professionals:

  o Gambling status was significantly associated with use of other health professionals: moderate-risk/problem gamblers were three and a half times more likely (OR 3.4) than those with no gambling problems to have sought help in the past 12 months.

Ecological factors and problematic gambling: Comparison of 2011/12 NZHS and the 2012 National Gambling Study

- Unlike the most recent National Gambling Study, no association was found between problem gambling and level of education or employment status.

- Both this research and the National Gambling Study found no significant relationship between the length of time an individual had been living in New Zealand (i.e. recent vs longer-term migrant status) and problem gambling.

- No relationship was observed between gambling and exposure to the Christchurch earthquake in the present research. However, the National Gambling Study found that current residents of Christchurch were significantly less likely than those living in Auckland or Wellington to experience problem gambling.

- This study and the National Gambling Study observed links between problem gambling and use of other dangerous consumptions, poor health and mental health.

7. RESULTS: EXPERIENCING PROBLEMS DUE TO SOMEONE ELSE'S GAMBLING

Respondents were asked "In the past 12 months, have you had problems because of someone else's gambling?" In total, 2.5% of adults aged 15 years and over indicated that they had been negatively impacted by someone else's gambling. This equates to approximately 89,100 (95% CI 77,000 - 101,100) adults in the New Zealand population[12].

7.6   Profile of people affected by someone else's gambling

The demographic characteristics (gender, age-group, ethnicity, neighbourhood deprivation, geography) of people affected by someone else's gambling were examined. Significant findings are discussed in the following sub-sections, while further details (prevalence estimates and 95% confidence intervals, odds ratios and p-values) can be found in Table 34, Appendix L.

7.6.1   By gender

Approximately two percent of males (2.1%) and three percent of females (2.9%) indicated that they had been affected by someone else's gambling in the past 12 months. This was a significant difference (p=0.0294), with males being significantly less likely than females (OR 0.7 and OR 1 respectively) to report being impacted by another person's gambling (see Table 34, Appendix L).

7.6.2   By age-group

Figure 35 illustrates the proportion of people affected by someone else's gambling by age-group. Age was significantly related to harm from someone else's gambling, with those aged 25-34 being three times (OR 3.2) more likely to report this compared with adults aged 65 or older. Table 34 in Appendix L provides further details on this item.

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[12] This estimate has been calculated using New Zealand 2006 Census data.

Figure 34: Have been affected by someone else's gambling in the past 12 months, by age-group, total population aged 15 years and over (unadjusted prevalence; N=12,576) [1]
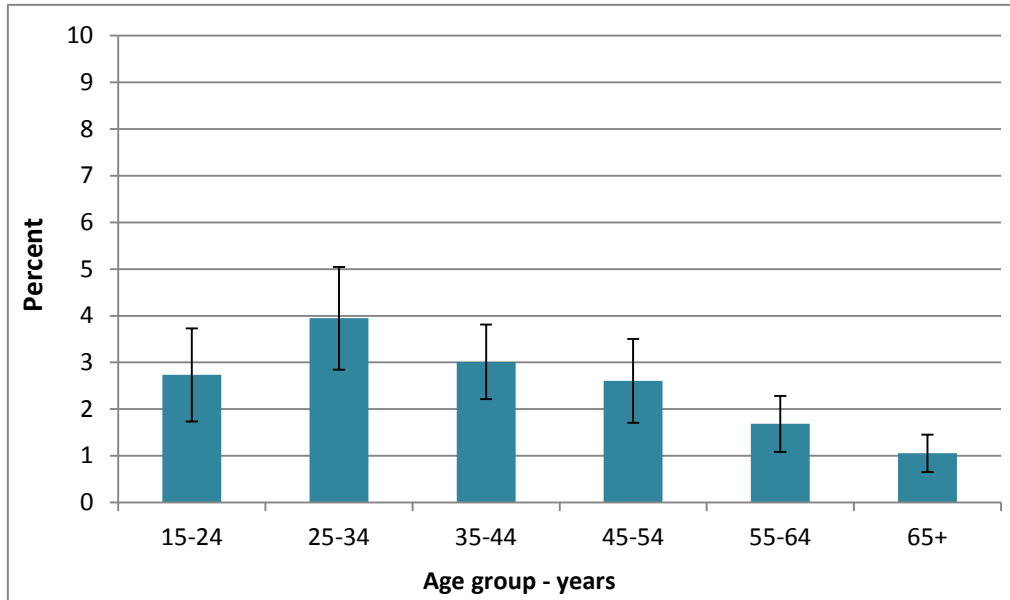
Notes:
1. Source: 2011/12 New Zealand Health Survey. Error bars are indicative of 95% confidence intervals.

7.6.3   By ethnicity

Compared with European/Other (2.3%), greater proportions of Māori (6.0%) and Pacific (4.6%) respondents experienced negative impacts from someone else's gambling. This relationship was significant (p<0.0001) and regression analysis revealed that Māori were nearly three (OR 2.8) and Pacific two (OR 2.0) times more likely than European/Other (OR1) to report negative impacts. Asian people were less likely to report being negatively impacted by someone else's gambling (OR 0.8). See Table 34 (Appendix L) for detailed results.

7.6.4   By neighbourhood deprivation

There was a general trend for the incidence of harm from other's gambling to increase with neighbourhood deprivation: 1.8% of those in the least deprived neighbourhoods rising steadily to 3.8% for neighbourhoods with the highest levels of deprivation. However, this relationship was not statistically significant (p=0.51). See Table 34 (Appendix L) for detailed results.

7.6.5 By geography

No relationship was evident between geographic location (i.e. living in a rural or urban) and being impacted by someone else's gambling.

7.7 Gambling status (PGSI score) and being affected by someone else's gambling

As outlined in Table 17, of the 2.5% of adults aged 15 and over who had been affected by someone else's gambling, approximately one-third were non-gamblers (31.2%), the majority were non-problem/recreational gamblers (56.8%), and 12% were classified as low- or moderate-risk/problem gamblers (i.e. they were experiencing some level of harm from their own gambling).

Table 17: Have been affected by other's gambling by gambling status (PGSI categorisation), total population aged 15 years and over (unadjusted prevalence) [1]

PGSI CATEGORISATION	n	AFFECTED BY OTHER'S GAMBLING		
		Prevalence for total adults (N=12,576)	Prevalence for those who've been affected (N=391)	Estimated number of people (95% CI) [2]
		% (95% CI)	% (95% CI)	
Total	391	2.5 (2.2 - 2.9)	100.0	89,100 (77,000 - 101,100)
Non-gambler	131	0.8 (0.6 - 1.0)	31.2 (25.6 - 36.8)	27,800 (21,900 - 33,700)
Non-problem / Recreational	209	1.4 (1.2 - 1.7)	56.8 (50.4 - 63.3)	50,600 (41,400 - 59,900)
Combined Problem, moderate-risk and low-risk [3]	51	0.3 (0.2 - 0.4)	12.0 (7.4 - 16.6)	10,700 (6,300 - 15,100)

Notes:
1. Source: 2011/12 New Zealand Health Survey.
2. Estimated number of people has been calculated using New Zealand 2006 Census data.
3. Due to small cell sizes / denominators (n<30), 'problem', 'moderate-risk' and 'low-risk' categories have been combined to enable their inclusion in this analysis.

Figure 35 illustrates this relationship and shows that the proportion of people affected by someone else's gambling increased along with problem gambling severity: 9.5% of people categorised as low- or moderate-risk/problem gamblers had been affected by someone else's gambling, compared with 2.9% of non-problem/recreational gamblers and 1.6% of non-gamblers.

Figure 35: Have been affected by other's gambling, by gambling status (PGSI categorisation), total population aged 15 years and over (unadjusted prevalence; N=12,576) [1]
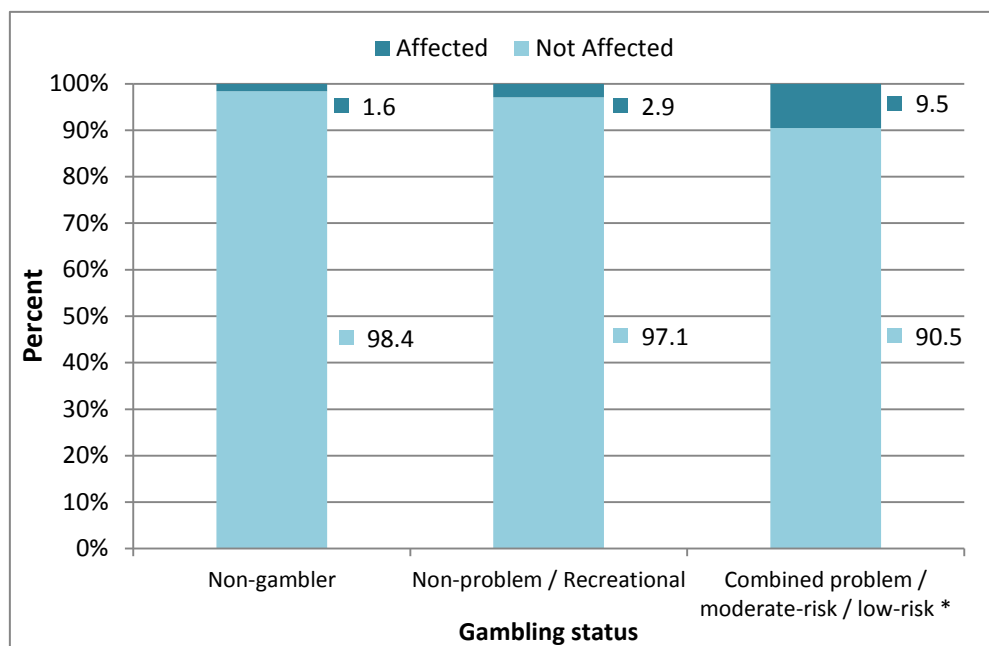
Notes:
1. Source: 2011/12 New Zealand Health Survey.
*   Due to small cell sizes / denominators (n<30), 'problem', 'moderate-risk' and 'low-risk' categories have been combined to enable their inclusion in this analysis.

7.8   Gambling activity and being affected by someone else's gambling

Respondents who had been impacted by someone else's gambling were asked to specify the gambling activity that had been involved ("Can you say what kind of gambling was involved?"). While the response options included eleven gambling activities, these have been combined to form the following six categories 13: Non-casino EGMs; Casino EGMs; Track or sports betting; Casino tables; Other/Housie/Internet gambling; and, Lotto/Keno/Instant Kiwi. Figure 36 illustrates that non-casino EGMs (52.9%), casino EGMs (32.0%) and track or sports betting (22.1%) were the modes most associated with harm from someone else's gambling. Less than ten percent of people who had been negatively impacted by another person's gambling cited casino tables, other/housie/internet, or lottery products as the activity that had been involved. Further details can be found in Appendix L (see Table 35).

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[13] These categories were combined due to small cell-sizes for some activities.

Figure 36: Negative impacts from someone else's gambling by activity that was involved, those who have been impacted (unadjusted prevalence; N=391) [1]
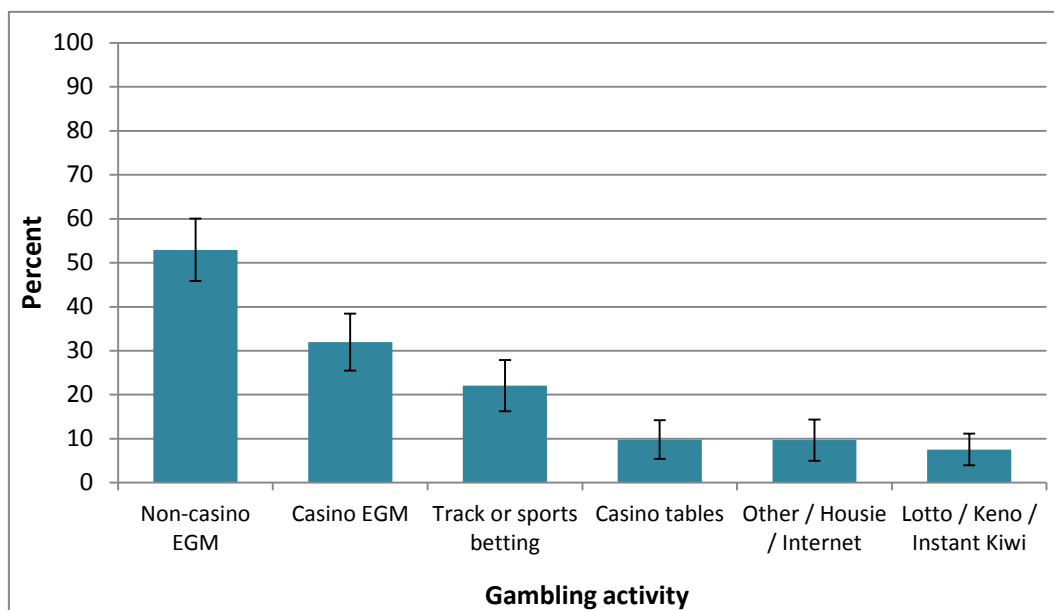
Notes:
1. Source: 2011/12 New Zealand Health Survey. Error bars are indicative of 95% confidence intervals.
2. Due to small cell sizes/denominators (n<30), some activities were combined with others to enable their inclusion in the analyses.
3. 'Lotto' includes 'Strike', 'Powerball', and 'Big Wednesday'.
4. Multiple responses were allowed.

7.9   SUMMARY: EXPERIENCING PROBLEMS DUE TO SOMEONE ELSE'S GAMBLING

Experiencing problems due to someone else's gambling - prevalence:

- 2.5% of adults aged 15 years and over indicated that they had been negatively impacted by someone else's gambling. This equates to approximately 89,100 (95% CI 77,000 - 101,100) adults in the New Zealand population.

Profile of people affected by someone else's gambling:

- Adults that had been affected by someone else's gambling were more likely to be female, aged 25-34 years, and identify as Māori or Pacific.

Gambling status (CPGI score) and being affected by someone else's gambling:

- The proportion of people affected by someone else's gambling increased along with problem gambling severity: 9.5% of people categorised as low- or moderate-risk/problem gamblers had been affected by

someone else's gambling, compared with 2.9% of non-problem/recreational gamblers and 1.6% of non-gamblers.

Gambling activity and being affected by someone else's gambling:

- Respondents who had been impacted by someone else's gambling were asked to specify the gambling activity that had been involved. Non-casino EGMs (52.9%), casino EGMs (32.0%) and track or sports betting (22.1%) were the modes most associated with harm from someone else's gambling.

8. DISCUSSION & CONCLUSIONS

This report presents results from an in-depth quantitative analysis of gambling and problem gambling data from the 2011/12 New Zealand Health Survey. The 2011/12 New Zealand Health Survey gathered data through face-to-face interviews with more than 12,000 randomly selected adults aged 15 years and over throughout New Zealand. It is a valuable source of information about health behaviours, lifestyles, health status, and access to healthcare. Questions on gambling and problem gambling have been included in the three most recent New Zealand Health Surveys - 2002/03, 2006/07 and 2011/12.

The overall aim of this project was to provide a comprehensive and detailed analysis of the full gambling and problem gambling data set collected in the 2011/2012 New Zealand Health Survey. Specifically, the research aimed to:

1. Provide population based estimates of gambling and problem gambling behaviours in relation to individuals' (adults aged 15 years or older) own gambling behaviour and the gambling behaviour of others (i.e. people affected by other's gambling).

2. Examine similarities and disparities in gambling and problem gambling behaviours according to major socio-demographic variables: age, gender, ethnicity, neighbourhood deprivation, education, employment status and income.

3. Explore associations between gambling and problem gambling behaviours and potential risk/resiliency factors, including: socio-demographic factors; use of alcohol, tobacco and other drugs; level of functioning; and, long-term mental health conditions (depression, manic depression, anxiety).

4. Examine trends over time for gambling and problem gambling data where permissible (i.e. time series analysis of NZHS gambling and problem gambling data from 2002/03, 2006/07 and 2011/12).

This research also aimed to compare and contrast findings with those of the National Gambling Study (Abbott et al., 2014a, 2014b) and earlier waves of the New Zealand Health Survey (Ministry of Health, 2006, 2009).

The following section presents a discussion of the key findings in relation to: Past-year gambling participation; Problematic gambling; Ecological factors and problematic gambling; People affected by other's gambling; Strengths and limitations; and, Conclusions. Throughout this section of the report, results from the 2011/12 New Zealand Health Survey will be compared and contrasted with other research. Table 18 provides an overview of national prevalence studies with gambling and problem gambling data and their methodological characteristics.

Table 18: Overview of recent gambling and problem gambling prevalence research in New Zealand - design and methodological characteristics

STUDY DETAILS / SPECIFICATIONS	STUDY						
	National Gambling Study (NGS) (Abbott et al., 2014b)	2011/12 New Zealand Health Survey (Ministry of Health, 2012a)	2012 Health & Lifestyles Survey (Tu, 2013)	2006/07 New Zealand Health Survey (Ministry of Health, 2009)	2002/03 New Zealand Health Survey (Ministry of Health, 2006)	Second National Gambling Prevalence Survey (Abbott & Volberg, 2000a)	First National Gambling Prevalence Survey (Abbott & Volberg, 1991)
Population (age range of sample)	Adults ≥18	Adults ≥15	Adults ≥15	Adults ≥15	Adults ≥15	Adults ≥18	Adults ≥18
Sample size (n)	6,251	12,370	2,672	12,488	12,929	6,452	4,053
Response rate	64%	79%	86%	68%	72%	75%	66%
Administration format	Face-to-face	Face-to-face	Face-to-face	Face-to-face	Face-to-face	Telephone	Telephone
Primary focus of survey	Gambling	Overall health	Overall health	Overall health	Overall health	Gambling	Gambling
Problem gambling measure	PGSI and SOGS-R	PGSI	PGSI	PGSI	Screen [1]	SOGS-R	SOGS-R
Interviewing method [2]	CAPI	CAPI	CAPI	CAPI	Structured interview	Structured interview	Structured interview
Number of gambling activities specified in questionnaire	29	12	10	10	9	16	14
Timeframe for data collection	17th March – 8th Oct, 2012	1st July 2011 – 30th June, 2012	1st May – 20th August, 2012	Sep 2006 – Nov 2007	Sep 2002 – Jan 2004	23rd Jan – 21st March 1999	

Notes:
1. The 2002/03 NZHS used an un-validated screen based on the SOGS, the Lie/Bet screen and DSM-IV criteria for problem gambling.
2. CAPI: Computer Assisted Personal Interviewing Software.

Two recent studies that are particularly important with regard to the monitoring of gambling behaviour in New Zealand are the National Gambling Study (Abbott et al., 2014b) and the 2012 Health and Lifestyles Survey (Tu, 2013). As a number of disparities between prevalence rates for gambling behaviour from these studies and those obtained through the 2011/12 NZHS will become apparent, it is important to briefly examine the methodologies employed by each of them. The research methods appear to be broadly similar in their sampling frames (nation-wide randomised samples), data collection methods (face-to-face interviews that used Computer Assisted Personal Interviewing (CAPI) software), and analytical techniques (e.g. sample weighting to ensure that the results represent the New Zealand adult population). However, small differences in methodologies can result in large disparities and there are a number of issues which may have contributed to the observed differences of prevalence data. Firstly, the response rates for the surveys varied: 64% for the National Gambling Study (Abbott et al., 2014b); 83% for the 2012 Health and Lifestyles Survey (Tu, 2013); and, 79% for the 2011/12 NZHS (Ministry of Health, 2012a). Given these response rates, it could be expected that results from the NZHS and the HLS would be more comparable. Secondly, the age-range of the survey population differed between the National Gambling Study (18 years or older) and the other two surveys, both of which surveyed those aged 15 years and older. It is also relevant to note that, compared to the NZHS and the Health and Lifestyles Survey, the range of gambling activities investigated through the National Gambling Study was more diverse and comprehensive. In particular, the NZHS did not enquire about a number of 'casual' modes of gambling that are known to be common and popular activities, such as 'bets with friends' and 'card games for money'. Importantly, the National Gambling Study also maintained a primary focus on gambling (and was introduced to participants in this way), as opposed to the inclusion of a gambling module within a broader survey of health and wellbeing issues (as employed by the NZHS and the Health and Lifestyles Survey) (Abbott et al., 2014b; Ministry of Health, 2013; Tu, 2013). This may have resulted in more interest in the National Gambling Study by people who are involved in gambling and therefore a higher rate of participation amongst this target population.

8.1   Past-year gambling participation

The 2011/12 wave of the NZHS found that approximately one-half of adults had participated in some form of gambling in the last 12 months. This estimate differs substantially from those obtained through other recent research in New Zealand. For instance, the 2012 Health and Lifestyles Survey found that 70% of New Zealand adults (aged 15 years and older) had gambled in the previous 12 months (Tu, 2013). Similarly, the 2012 National Gambling Study reported a past 12-month gambling participation rate of 80% (Abbott et al., 2014b).

A significant and steady decline was observed in the rates of past-year gambling across the NZHS waves: 66% in 2002/03, 60% in 2006/07 and 50% in 2011/12.   This trend is consistent with those observed for the National Gambling Study (and the previous national surveys commissioned by the DIA) and the Health and Lifestyles Survey series (Abbott et al., 2014b; Tu, 2013). It also corresponds with the decreasing trend observed in adolescent gambling patterns in New Zealand: the Youth'12 Health and Wellbeing Survey observed significant decreases for adolescent involvement in gambling from 2007 to 2012 (Rossen et al., 2013).

However, despite decreasing trends being observed across the NZHS, the National Gambling Study and the Health and Lifestyles Surveys, the discrepancies between the much lower gambling rates observed in the 2011/12 NZHS and those reported by the other studies are substantial. While these differences cannot be accounted for fully, the lower rates reported by the NZHS may be partially attributable to methodological differences such as the question structure for each survey. For instance, the 2011/12 NZHS asked participants to specify the activities they had gambled on in the past year via one question. In contrast, the National Gambling Study was more comprehensive in its enquiries and asked about gambling activities via the following questions: an initial overall list of activities in which 'betting or gambling' was included; two questions about participation in specific gambling activities in the past 12 months; and detailed questions for each gambling activity that the participant had taken part in (frequency, monthly expenditure, reasons for gambling, estimation of whether they had won/lost/broken even, whether they had used a system/skills). Moreover, the National Gambling Study provided prompts for 29 gambling activities, compared with 12 in the 2011/12 NZHS

(see Table 18). The inclusion of these extra prompts/questions in the National Gambling Study may have resulted in a more in-depth account of each individual's gambling behaviour.

Māori, European/Other and Pacific people all reported similar rates of past-year gambling in the 2011/12 NZHS; approximately one-in-two adults from these population groups had gambled in the past year. This contrasted with around one-in-three for the Asian population. Overall, participation rates were highest for Māori, followed by European/Other, Pacific and then Asian. While the specific rates differ to those observed in other research, the order/pattern of past-year participation rates that were observed for ethnicity are consistent with those from both the National Gambling Study (Abbott et al., 2014b) and the Health and Lifestyles Survey (Tu, 2013). Participation in gambling was significantly more common amongst mid to older age groups (25 years or older) with those aged 18-24 being less involved in gambling. This reflects findings from other research with New Zealand adults, although it was less pronounced in the National Gambling Study and the Health and Lifestyles Survey (Abbott et al., 2014b; Tu, 2013).

Lottery products were the most popular and preferred gambling activities, with almost one-half of adults having gambled on Lotto in the past year. In contrast, less than ten percent of adults had gambled on EGMs (casino and/or non-casino), track or sports betting, casino gambling (EGMs and/or tables), Keno, housie and 'other' in the previous year. While it is difficult to make direct comparisons (due to varying categorisation of gambling activities), these results seem largely consistent, although more conservative than those observed in both the National Gambling Study (Abbott et al., 2014b) and the Health and Lifestyles Survey (Tu, 2013).

Significant decreases in participation across the three NZHS survey waves (2002/03, 2006/07, 2011/12) were observed for a number of activities, including Lotto, Instant Kiwi, non-casino EGMs, track betting, casino EGMs, sports betting, Keno and Housie. Similar decreases were noted in the Health and Lifestyles Survey (Tu, 2013) and the National Gambling Study, where findings were compared with those of the previous DIA surveys (conducted in 1985, 1990, 1995, 2000 and 2005) to gain a greater understanding of long-term trends in gambling behaviour (Abbott et al., 2014b). Overall, gambling participation for most activities in New Zealand

appeared to increase across the earlier timeframes/studies and then drop off from the late 1990s onwards (Abbott et al., 2014b), in-line with findings from the present study.

While approximately one-third of adults had gambled on only one activity in the last 12 months, a small proportion (three percent) had gambled on 'four or more' activities. Gambling on a greater number of activities was more prevalent amongst males, younger age groups, Māori and European/Other, those who lived in urban locations, and people who had gambled on Keno, casino tables, and EGMs (casino and/or non-casino). This is inconsistent with both the National Gambling Study and the Health and Lifestyles Survey which reported that one-fifth and one-quarter (respectively) had gambled on 'four or more' activities (Abbott et al., 2014b; Tu, 2013). As with past-year gambling rates, discrepancies between the number of activities reported by the 2011/12 NZHS and the National Gambling Study may be partially attributable to differences in the level of questions/prompts and range of specified gambling activities in the two studies. As mentioned previously (and outlined in Table 18), the National Gambling Study included more prompts and a more comprehensive range of gambling activities than the 2011/12 NZHS.   However, this does not explain why the 2011/12 NZHS resulted in much lower rates than the Health and Lifestyles Survey, as both surveys asked participants about a similar number of gambling activities.

The current study observed that the number of gambling activities that people participate in has significantly decreased over time - there was an overall decreasing trend with people participating in fewer activities with each survey wave (NZHS waves 2002/03, 2006/07, 2011/12). This is in-line with the decrease observed in the National surveys from 1995 onwards (Abbott et al., 2014b).

8.2   Problematic gambling

This study found that 3.2%, or an estimated 112,800 adults, were experiencing some level of harm and/or negative consequences as a result of their gambling; 0.2% satisfied the PGSI past-year criteria for problem gambling, 1.0% were categorised as moderate-risk and a further 2% satisfied the criteria for low-risk gambling.

These estimates are lower than those obtained by both the National Gambling Study (0.7% problem gambling, 1.8% moderate-risk and a further 5% low-risk gambling (Abbott et al., 2014a)) and the Health and Lifestyles Survey (0.7% problem gambling and a further 2.4% moderate-risk gambling (Tu, 2013)). While the methodological differences outlined previously may have partially contributed to the lower rates that have been observed in the 2011/12 NZHS, the factors contributing to these differences are unclear.

Both the National Gambling Study and this study found that loss of control, feelings of guilt and chasing losses were the most frequently endorsed items on the PGSI. These findings may be useful for those working in public health to assist with the targeting of health promotion messages to adults who are experiencing gambling-related problems.

As with the National Gambling Study, there were no significant changes over time in the NZHS (from 2006/07 to 2011/12) in the prevalence of moderate-risk or problem gambling[14]. However, a significant reduction was observed in the proportion of low-risk gamblers[15] – although this may have been a consequence of the increased proportion of non-problem/recreational gamblers. This was in contrast to the National Gambling Study, which found no difference in the proportion of low-risk gamblers over time (Abbott et al., 2014a).

A number of demographic risk-factors were evident with regard to problematic gambling in this research. Adults that satisfied the criteria for moderate-risk/problem gambling were more likely to be male, aged 25-34 or 45-54, identify as Māori or Pacific, and live in urban neighbourhoods with higher levels of deprivation. This is largely congruent with other research, although the National Gambling Study did not find any significant age differences (Abbott et al., 2014a) and the 2006/07 NZHS found that those aged 35-44 had the highest prevalence of problem gambling (Ministry of Health, 2009). These findings have important implications for the delivery of public health messages and for those involved in public health interventions at the secondary and tertiary levels (see Korn & Shaffer, 1999).

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[14] Based on an overall p-value of <0.0001 and overlapping 95% confidence intervals.
[15] Based on an overall p-value of <0.0001 and non-overlapping 95% confidence intervals.

While there was an overall trend for the severity of gambling problems to increase along with rate of participation in each gambling activity, EGMs were associated with the highest risk of problematic gambling. Moderate-risk/problem gamblers were 14 times more likely to have gambled on any EGM and 13 times more likely to have gambled on non-casino EGMs than non-problem/recreational gamblers. Participation in continuous modes of gambling has frequently been identified in national and international research as a substantial risk factor in the development of problematic gambling (Abbott et al., 2014a; Abbott & Volberg, 2000b; Adams et al., 2004; Health Sponsorship Council, 2012; Orford, 2011; Productivity Commission, 2010; Rossen et al., 2013; Tu, 2013). There is clearly a need for effective harm minimisation and promotion efforts to be developed and introduced with a particular focus on EGMs.

There was also evidence that problem gamblers have a greater overall involvement in gambling; the prevalence of problem gambling increased along with the number of activities that adults had gambled on. Low-risk and moderate-risk/problem gamblers were 12 and 23 times more likely to have gambled on 'four or more' activities compared with adults who gambled at non-problem/recreational levels. A relationship between a greater number of gambling activities and an increased risk of problem gambling was observed in the previous New Zealand Health Survey (Ministry of Health, 2009), the National Gambling Study (Abbott et al., 2014a) and the 2012 Health and Lifestyles Survey (Tu, 2013).

8.3 Ecological factors and problematic gambling

This research investigated the role of various ecological factors in gambling behaviour. Unlike the most recent National Gambling Study (Abbott et al., 2014a) and the 2006/07 New Zealand Health Survey (Ministry of Health, 2009), no association was found between problem gambling and level of education or employment status.

Both this research and the National Gambling Study (Abbott et al., 2014a) found no significant relationship between the length of time an individual had been living in New Zealand (i.e. recent vs longer-term migrant

status) and problem gambling. However, while not significant, the current research found a general trend in relation to the length of time living in New Zealand and risky gambling: greater proportions of people who had lived in New Zealand for six or more years were experiencing some gambling related harm (low-risk, combined moderate-risk/problem) compared with those who had resided here for less than five years. This trend corresponds with research and anecdotal evidence that settlement issues, lack of exposure to gambling, and the 'honeymoon period' (associated with good health in immigrants) are important factors in problem gambling behaviour amongst immigrant populations (Dixon, Tse, Rossen, & Sobrun-Maharaj, 2010; Rossen, Tse, & Vaidya, 2009; Sobrun-Maharaj, Rossen, & Wong, 2013; Wong & Tse, 2003). It is likely that the failure of this item to reach significance in the current research can be attributed to the limitations associated with small cell-sizes/numbers for these items.

The 22 February, 2011 Christchurch earthquake resulted in the death of 185 people and injured many others. The devastating impacts of this earthquake, and the many aftershocks, have resulted in ongoing disruption to the lives and wellbeing of those living in the Canterbury region. To enable the Ministry of Health to monitor the long-term health impacts of the earthquake, respondents of the 2011/12 New Zealand Health Survey were asked if they were a resident of Christchurch at the time of the earthquake. No relationship was observed in the 2011/12 NZHS between gambling and exposure to the Christchurch earthquake. This contrasts with the National Gambling Study which found that current residents of Christchurch were significantly less likely than those living in Auckland or Wellington to experience problem gambling (Abbott et al., 2014a). Overall, there is a paucity of research into the effects of the Christchurch earthquakes on residents' health and wellbeing. However, it is heartening to note that recently released research on the impacts of the earthquakes in relation to other dangerous consumptions, have found no significant increases in the rates of drinking or illicit drug taking in those who had reported being adversely affected by the earthquakes (Fergusson, Horwood, Boden, & Mulder, 2014). Similarly, analysis of the Youth'12 data found no significant differences between Christchurch

youth and youth from the rest of New Zealand with regard to weekly alcohol use, binge drinking or current marijuana use (Fleming et al., 2013).

Local and international research has consistently highlighted links between problem gambling and use of other dangerous consumptions, poor health and mental health (Abbott et al., 2014a; Abbott & Volberg, 1996; Ministry of Health, 2006, 2009; Productivity Commission, 2010; Rossen et al., 2013; Rossen et al., 2009; Volberg, Gupta, Griffiths, Ólason, & Delfabbro, 2010). The current research provides further evidence of the propensity of problem gambling to co-exist with other issues. With regard to dangerous consumptions, as gambling behaviour intensified from low-risk to moderate-risk/problem, the likelihood of the following increased significantly: alcohol use, hazardous drinking, alcohol dependence, cigarette smoking, overall drug use, cannabis use, and use of other drugs.

There is also substantial evidence for the co-existence of problem gambling with psychological distress (Abbott et al., 2014a; Abbott & Volberg, 1996; Ministry of Health, 2006, 2009; Productivity Commission, 2010; Rossen et al., 2013; Rossen et al., 2009; Volberg et al., 2010). This research found that the likelihood of experiencing a psychological disorder (anxiety and/or depression) was significantly higher amongst those with gambling problems; a finding that was also observed in the most recent National Gambling Study (Abbott et al., 2014a). Moreover, people with gambling problems were significantly more likely than other adults to have been diagnosed by a doctor with depression, bipolar disorder or an anxiety disorder; a finding that is unique to this study.

People with increased severity of gambling problems also reported lower levels of functioning in all of the health domains measured by the SF-12. This trend was particularly strong for the domains of general health (GH), vitality (VT), social functioning (SF), role limitation – emotional (RE), and mental health (MH). A trend was also observed in relation to gambling status and Summary Physical (SPH) and Mental (SMH) Health scores: people with increasing severity of gambling problems were more likely to report lower levels of functioning in

these summary domains. These results are consistent with those observed in the 2006/07 New Zealand Health Survey (Ministry of Health, 2009).

Adults with gambling problems were twice as likely as their peers to have used health services (General Practitioners) in the past 12 months. Moderate-risk/problem gamblers were also more likely to report not being able to see a General Practitioner when they needed to and that cost was a barrier to seeking help from health professionals. Despite the cost-barriers, these findings reiterate that General Practitioners are ideally placed to assist those with gambling problems through the treatment of associated medical issues, provision of information on problem gambling, delivery of brief interventions and referrals to specialist agencies (Goodyear-Smith et al., 2006; Thomas, Piterman, & Jackson, 2008). Moderate-risk/problem gamblers were also three and a half times more likely than those with no gambling problems to have sought assistance from a psychologist, counsellor or social worker in the past 12 months. These findings are consistent with those reported in the 2006/07 New Zealand Health Survey (Ministry of Health, 2009).

8.4   Experiencing problems due to someone else's gambling

Two and a half percent, or an estimated 89,100 adults, said they had been affected by someone else's gambling in the past 12 months.   Adults who had been affected by someone else's gambling were more likely to be female, aged 25-34 years, and identify as Māori or Pacific. There was also a relationship between problem gambling status and the likelihood of being impacted by someone else's gambling; low- or moderate-risk/problem gamblers were increasingly more likely to have been affected by someone else's gambling. EGMs (non-casino and casino) and track/sports betting were the activities most associated with harm from someone else's gambling. These findings correspond with results from the previous Health Survey (Ministry of Health, 2009) and again highlight the need to prioritise harm minimisation and public health efforts in relation to EGMs.

8.5   Strengths and limitations

The New Zealand Health Survey series is a valuable source of information on New Zealand adults' health behaviours, lifestyles, health status, and healthcare access. The 2011/12 survey was methodologically robust and comprised of face-to-face interviews with more than 12,000 randomly selected adults aged 15 years and over throughout New Zealand[16].   The results are based on the usually resident population of New Zealand, which includes adults who are living in permanent dwellings, student accommodation, and aged-care facilities. It should be noted that the sample did not include people who were living in institutions such as long-term hospital care (i.e. hospital and dementia-level services in aged-care facilities), prisons, the homeless, short-term visitors, and tourists. As such, the results reported here may not be fully representative of the New Zealand population, particularly as there is evidence that some of these populations (e.g. prisoners) are disproportionately affected by gambling and problem gambling in New Zealand (Abbott & McKenna, 2000; Abbott, McKenna, & Giles, 2000; McKenna, Brown, Rossen, & Gooder, 2013).

Questions on gambling and problem gambling have been included in the last three New Zealand Health Surveys (2002/03, 2006/07 and 2011/12), allowing for some analyses of trends over time. The inclusion of the PGSI, which has been validated for use with New Zealand's population (Devlin & Walton, 2012), in both the 2006/07 and 2011/12 surveys enables problem gambling harm to be monitored across time.

As data from the New Zealand Health Survey is cross-sectional (i.e. data is collected at one point of time), associations and the co-existence of issues can be identified. For example, we can identify that hazardous drinking and problematic gambling are significantly correlated and that gambling on EGMs is significantly associated with problem gambling. However, it is not possible to determine causality or the nature of co-morbidities with cross-sectional data.

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[16] Detailed reports on the NZHS survey design and methodology are available online (see Ministry of Health, 2011, 2012b).

As with all studies that rely on self-report for sensitive topics, such as problem gambling, it is possible that social responsibility response bias may have occurred in this research. In essence, social responsibility bias is the tendency for people to deny traits and behaviours that are perceived as being socially undesirable and admit to those that are more acceptable (Randall & Fernandes, 1991). This type of response bias may be particularly evident in research where anonymity is not integrated into the research design (Marquis, Marquis, & Polich, 1986), particularly in relation to sensitive topics such as gambling (Williams & Volberg, 2010). It is also possible that recall bias may have impacted the ability of respondents to accurately report on gambling and other behaviours over the past 12 months (Choi & Pak, 2005).

As outlined previously, a number of discrepancies were apparent between the results from this research and those gained via the National Gambling Study and the Health and Lifestyles Survey. These may be partially, but not fully, attributable to response and/or sample biases bought about by the different foci of the research projects: The NZHS included gambling as one topic amongst a survey of numerous issues related to health and wellbeing; and, The National Gambling Study maintained a primary focus on gambling and related behaviours and lifestyle factors and was introduced to participants as "The national survey of lotteries, gaming and betting activities". As Williams and Volberg (2010) point out in their report on best practice for obtaining population estimates of gambling and problem gambling, a primary reason for people choosing to not participate in research is a lack of interest in the topic. When comparing discrepancies between gambling estimates in North American studies, they suggest that "it is quite possible that gamblers participated at a higher rate [in studies with a primary focus on gambling] because of their greater interest in the topic, resulting in an artifactually high obtained prevalence of gambling (and consequently, problem gambling) among the participants." (p. 14). As such, it could be argued that the 2011/12 NZHS may have recruited a smaller proportion of people with an interest in gambling than the National Gambling Study and therefore underestimated gambling and problem gambling amongst adults in New Zealand. However, the discrepancies discussed by Williams and Volberg

(2010) were significantly smaller and it seems likely that other unknown factors have contributed to the reduced rates found by the 2011/12 NZHS.

A number of results in this report have been presented separately for Pacific and Asian adults. It should be noted that Pacific participants included those who identified as Samoan, Cook Island Māori, Tongan, and Niuean. Asian adults included respondents who identified as Chinese and Indian. Despite being categorised as either Pacific or Asian, these categories constitute a range of different ethnicities and cultures. However, due to the small numbers of participants from certain Pacific and Asian ethnic groups, further sub-group analyses were not possible.

8.6   Conclusions

Overall, this research indicates that adult participation in gambling has decreased. However, problem gambling continues to be a significant public health issue in New Zealand, with stable proportions of the population gambling at problem and moderate-risk levels. In total, 2.0% satisfied the criteria for low-risk gambling, 1.0% for moderate-risk gambling, and 0.2% for problem gambling; approximately 112,800 New Zealand adults are experiencing negative impacts as a result of their own gambling. A further 2.5%, or approximately 89,100 adults, had experienced negative impacts due to someone else's gambling in the past year.

Problematic gambling was associated with a number of co-existing issues, including hazardous drinking, smoking, drug use, and psychological distress/disorders. While people experiencing problem gambling were more likely to have accessed healthcare in the past year they were also more likely to say that they had been unable to access such help due to financial difficulties. These findings have important implications for the delivery of assistance to those with problem gambling issues and support the need for facilitation and strong inter-agency communication and cooperation between those working in the areas of problem gambling, alcohol and drug treatment, and primary-care health services.

This report found that EGMs, both in and out of casinos, are associated with the most harm from gambling and that Māori, Pacific people and those living in neighbourhoods with higher levels of deprivation are more likely to satisfy problem gambling criteria and to be affected by someone else's gambling. These findings are consistent with those documented elsewhere (e.g. Abbott et al., 2014a; Abbott & Volberg, 1991, 1996; Ministry of Health, 2009; Rossen et al., 2013), and are reflected in the Ministry of Health's 2010/11 - 2015/16 strategic plan which recognises health inequalities between Māori and Pacific peoples and non-Māori non-Pacific peoples, and peoples with low socioeconomic status in relation to gambling harms (Ministry of Health, 2010a).

While more research is required on gambling and problem gambling amongst Māori, Pacific peoples, and people living in neighbourhoods with higher levels of deprivation, current evidence suggests that gambling and problem gambling are usually part of a larger set of social problems. As such, gambling must be viewed through an inequalities framework that takes into account the wider social context, including the roles of family and whānau (Abbott et al., 2014a, 2014b; Bellringer et al., 2013; L. Dyall, 2003; L. Dyall, Thomas, & Thomas, 2009; Perese, 2009; Rossen, Butler, & Denny, 2011; Rossen et al., 2013; Tse et al., 2012). This corresponds with the Ministry's strategic plan, which emphasises a public health approach and the importance of whānau ora in addressing health inequalities; "Whānau ora involves facilitating positive and adaptive relationships within whānau and recognising the interconnectedness of health, education, housing, justice, welfare and lifestyle as elements of whānau wellbeing" (Ministry of Health, 2010a, p.6).

REFERENCES

Abbott, M., Bellringer, M., Garrett, N., & Mundy-McPherson, S. (2014a). *New Zealand 2012 National Gambling Study: Gambling Harm and Problem Gambling. Report Number Two*. Auckland: Gambling and Addictions Research Centre, Auckland University of Technology.

Abbott, M., Bellringer, M., Garrett, N., & Mundy-McPherson, S. (2014b). *New Zealand 2012 National Gambling Study: Overview and Gambling Participation. Report Number One*. Auckland: Gambling and Addictions Research Centre, Auckland University of Technology.

Abbott, M., & McKenna, B. (2000). *Gambling and problem gambling among recently sentenced women prisoners in New Zealand*. Wellington: Department of Internal Affairs.

Abbott, M., McKenna, B., & Giles, L. C. (2000). *Gambling and probelm gambling among recently sentenced males in four New Zealand prisons*. Wellington: Department of Internal Affairs.

Abbott, M., & Volberg, R. A. (1991). *Gambling and problem gambling in New Zealand. Research Series No.12*. Wellington: Department of Internal Affairs.

Abbott, M., & Volberg, R. A. (1996). The New Zealand National Survey of problem and pathological gambling. *Journal of Gambling Studies, 12*(2), 143-160.

Abbott, M., & Volberg, R. A. (2000a). *Taking the pulse on gambling and problem gambling in New Zealand: A report on phase one of the 1999 national prevalence survey (Report number three of the New Zealand Gaming Survey)*. Wellington: The Department of Internal Affairs.

Abbott, M., & Volberg, R. A. (2000b). *Taking the pulse on gambling and problem gambling in New Zealand: Phase One of the 1999 National Prevalence Survey. Report number three of the New Zealand Gaming Survey*. Wellington: Department of Internal Affairs.

Adams, P., Rossen, F., Perese, L., Townsend, S., Brown, R., & Garland, J. (2004). *Gambling Impact Assessment for Seven Auckland Territorial Authorities. Part One: Introduction and Overview*. Auckland: Centre for Gambling Studies, University of Auckland.

Ahmad, O. B., Boschi-Pinto, C., Lopez, A. D., Murray, C. J. L., Lozano, R., & Inoue, M. (2001). *Age Standardization of Rates: A New WHO Standard (Technical report). GPE Discussion Paper Series: No.31.* . World Health Organization (WHO). Retrieved from http://www.who.int/healthinfo/paper31.pdf.

Andrews, G., & Slade, T. (2001). Interpreting scores on the Kessler Psychological Distress Scale (k10). *Australian and New Zealand Journal of Public Health, 25*, 494-497.

Babor, T. F., Higgins-Biddle, J. C., Saunders, J. B., & Monteiro, M. G. (2001). *The Alcohol Use Disorders Identification Test: Guidelines for Use in Primary Care*. Geneva: Department of Mental Health and Substance Dependence, World Health Organisation.

Bellringer, M., Fa'amatuainu, B., Taylor, S., Coombes, R., Poon, Z., & Abbott, M. (2013). *Exploration of the Impact of Gambling and Problem Gambling on Pacific Families and Communities in New Zealand*. Auckland: AUT University.

Choi, B. C. K., & Pak, A. W. P. (2005). A Catalog of Biases in Questionnaires. *Preventing Chronic Disease, 2*(1), http://www.cdc.gov/pcd/issues/2005/jan/2004_0050.htm.

Department of Internal Affairs. (2007). *People's participation in, and attitudes to, gambling, 1985-2005: Results of the 2005 survey*. Wellington: Department of Internal Affairs.

Department of Internal Affairs. (2013). Gambling regulation in New Zealand: Fact Sheet #1. Retrieved 9 October, 2014, from http://www.dia.govt.nz/diawebsite.nsf/Files/GamblingFactSheets-Feb2013/$file/FactSheet1-Feb2013.pdf

Department of Internal Affairs. (2014a). Gambling Expenditure Statistics. Retrieved 9 October, 2014, from http://www.dia.govt.nz/diawebsite.nsf/wpg_URL/Resource-material-Information-We-Provide-Gambling-Expenditure-Statistics

Department of Internal Affairs. (2014b). Gaming machines numbers: June 1994 to September 2014 at 3-monthly intervals. Retrieved 9 October, 2014, from http://www.dia.govt.nz/Pubforms.nsf/URL/LineGraph_30%20September%202014.pdf/$file/LineGraph_30%20September%202014.pdf

Department of Internal Affairs. (2014c). *Problem gambling in New Zealand – a brief summary*. Wellington, New Zealand: Department of Internal Affairs.Retrieved from https://www.dia.govt.nz/pubforms.nsf/URL/ProblemGamblingFactsFinal.pdf/$file/ProblemGamblingFactsFinal.pdf

Devlin, M., & Walton, D. (2012). The prevalence of problem gambling in New Zealand as measured by the PGSI: Adjusting prevalence estimates using meta-analysis. *International Gambling Studies, 12*(2), 177-197.

Dixon, R., Tse, S., Rossen, F., & Sobrun-Maharaj, A. (2010). *Family resilience: the settlement experience for Asian immigrant families in New Zealand*. Wellington: The Families Commission.

Dyall, L. (2003). *Kanohi ki te Kanohi: A Maori Face to Gambling* (Doctor of Philosophy - PhD). University of Auckland, Auckland.

Dyall, L., Thomas, Y. L., & Thomas, D. (2009). *The Impact of Gambling on Maori*. Nga Pae o te Maramatanga.

Fergusson, D. M., Horwood, L. J., Boden, J. M., & Mulder, R. T. (2014). Impact of a major disaster on the mental health of a well-studied cohort. *JAMA Psychiatry*.

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

Fleming, T., Clark, T. C., Denny, S., Robinson, E., Rossen, F., Bullen, P., . . . The Adolescent Health Research Group. (2013). *The health and wellbeing of secondary school students in Christchurch: Findings from the Youth'12 national youth health and wellbeing survey*. Auckland, New Zealand: The University of Auckland.

Frieling, M. A., Davis, W. R., & Chiang, G. (2013). The SF-36v2 and SF-12v2 health surveys in New Zealand: norms, scoring coefficients and cross-country comparisons. *Australian and New Zealand Journal of Publlic Health, 37*(1), 24-31.

Gandek, B., Ware, J. E., Aaronson, N. K., Apolone, G., Bjorner, J. B., Brazier, J. E., . . . Sullivan, M. (1998). Cross-validation of item selection and scoring for the SF-12 Health Survey in nine countries: results from the IQOLA Project. International Quality of Life Assessment. *Journal of Clinical Epidemiology, 51*(11), 1171-1178.

Goodyear-Smith, F., Arroll, B., Kerse, N., Coupe, N., Sullivan, S., Tse, S., . . . Perese, L. (2006). Primary care patients reporting concerns about their gambling frequently have other co-occurring lifestyle and mental health issues. . *BMC Family Medicine, 7*(25), U16606465.

Health Sponsorship Council. (2012). *New Zealanders' Knowledge, Views and Experience of Gambling and Gambling Harm: Results from the 2010 Health and Lifestyles Survey*. Wellington, New Zealand: Health Sponsorship Council.Retrieved from Retrieved from http://www.hsc.org.nz/researchpublications.html

Korn, D., & Shaffer, H., J. (1999). Gambling and the health of the public: Adopting a public health perspective. *Journal of Gambling Studies, 15*(4), 289-365.

Marquis, K. H., Marquis, S., & Polich, J. M. (1986). Response Bias and Reliability in Sensitive Topic Surveys. *Journal of the American Statistical Association, 81*(394), 381-389.

McKenna, B., Brown, R., Rossen, F., & Gooder, C. (2013). *Delivery of Problem Gambling Services to Prisoners*. Auckland: Centre for Gambling Studies and The Centre for Mental Health Research. Auckland UniServices Ltd, The University of Auckland.

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. (2008). *Intervention Service Practice Requirements Handbook (version 1.1)*. 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. (2010a). *Preventing and Minimising Gambling Harm: Six-year strategic plan 2010/11-2015/16*. Wellington: Ministry of Health.

Ministry of Health. (2010b). *Preventing and Minimising Gambling Harm: Three-year service plan 2010/11–2012/13*. Wellington: Ministry of Health.

Ministry of Health. (2011). *The New Zealand Health Survey: Sample design, years 1-3 (2011-2013)*. Wellington: Ministry of Health.

Ministry of Health. (2012a). *The Health of New Zealand Adults 2011/12: Key Findings of the New Zealand Health Survey*. Wellington: Ministry of Health.

Ministry of Health. (2012b). *New Zealand Health Survey Methodology Report*. Wellington: Ministry of Health.

Ministry of Health. (2012c). *Problem Gambling in New Zealand: Preliminary Findings From the New Zealand Health Survey (July 2011 to March 2012)*. Wellington: Ministry of Health.

Ministry of Health. (2013). *New Zealand Health Survey: Content Guide 2012-2013*. Wellington: Ministry of Health.

Ministry of Health. (2014). Intervention client data. Retrieved 09/10/2014, 2014, from http://www.health.govt.nz/our-work/mental-health-and-addictions/problem-gambling/service-user-data/intervention-client-data#total_assisted

Orford, J. (2011). *An unsafe bet?: The dangerous rise of gambling and the debate we should be having.* Chichester: Wiley Blackwell.

Parliamentary Council Office. (2003). *Gambling Act 2003*. New Zealand: New Zealand Government.

Perese, L. (2009). *You bet your life...and mine! Contemporary Samoan gambling in New Zealand* (PhD). The University of Auckland, Auckland.

Phillips, J. (2006). Sports and leisure. Retrieved 26 October, 2006, from http://www.TeAra.govt.nz/NewZealandInBrief/SportsAndLeisure/2/en

Productivity Commission. (2010). *Gambling, Report no. 50*. Canberra: Productivity Commission.

Randall, D. M., & Fernandes, M. F. (1991). The social desirability response bias in ethics research. *Journal of Business Ethics, 10*(11), 805-817.

Rossen, F., Butler, R., & Denny, S. (2011). *An Exploration of Youth Participation in Gambling and the Impact of Problem Gambling on Young People in New Zealand*. Auckland: Centre for Gambling Studies, Auckland UniServices Limited, The University of Auckland.

Rossen, F., Fleming, T., Lucassen, M., Denny, S., Peiris-John, R., Teevale, T., . . . The Adolescent Health Research Group. (2013). *The Health and Wellbeing of New Zealand Secondary School Students in 2012: Youth Gambling*. Auckland, New Zealand: The University of Auckland.

Rossen, F., Tse, S., & Vaidya, R. (2009). *New Zealand Asian and Youth Gambling: A Secondary Analysis of Data from the Health Sponsorship Council 2006/07 Gaming and Betting Attitudes Survey*. Auckland: University of Auckland.

Salmond, C., Crampton, P., & Atkinson, J. (2007). *NZDep2006 Index of Deprivation*. Department of Public Health, University of Otago.

SAS Institute Inc. (2011). *SAS/STAT Software (Version 9.3)*. Cary, NC: SAS International.

Sobrun-Maharaj, A., Rossen, F., & Wong, A. S. K. (2013). Negative impacts of gambling on Asian families and communities in New Zealand. *Asian Journal of Gambling Issues and Public Health, 3*(14).

Statistics New Zealand. (2014). Classifications and related statistical standards - Sex. Retrieved 10 October, 2014, from http://www.stats.govt.nz/methods/classifications-and-standards/classification-related-stats-standards/sex/definition.aspx

Thomas, S. A., Piterman, L., & Jackson, A. C. (2008). Problem gambling: what general practitioners need to know and do about it? *Medical Journal of Australia, 189* 135-136.

Tse, S., Dyall, L., Clarke, D., Abbott, M., Townsend, S., & Kingi, P. (2012). Why People Gamble: A Qualitative Study of Four New Zealand Ethnic Groups. *International Journal of Mental Health Addiction, 10*(6), 849–861.

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

Volberg, R., Gupta, R., Griffiths, M., Ólason, D., & Delfabbro, P. (2010). An international perspective on youth gambling prevalence studies. *International Journal of Adolescent Medicine & Health, 22*(1), 3-38.

Ware, J. E., Kosinki, M., & Keller, S. D. (1996). A 12-Item Short-Form Health Survey: construction of scales and preliminary tests of reliability and validity. *Medical Care, 34*, 220-233.

Ware, J. E., Kosinki, M., Turner-Bowker, D. M., & Gandek, B. (2002). *How to score Version 2 of the SF-12 Health Survey (With a Supplement Documenting Version 1)*. Lincoln, RI: QualityMetric Incorporated.

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. March 31, 2010.

Wong, J., & Tse, S. (2003). The face of Chinese migrants' gambling: A New Zealand perspective. *Electronic Journal of Gambling Issues: eGambling,* (9).

World Health Organisation. (2014). What do we mean by "sex" and "gender"? Retrieved 10 October, 2014, from http://www.who.int/gender/whatisgender/en/

APPENDICES

Appendix A   Overview of NZHS 2011/12 gambling questions

VARIABLE NAME	QUESTION	RESPONSE OPTIONS	MULTIPLE / SINGLE RESPONSE
I will now ask you some questions about gambling. Most New Zealanders enjoy gambling. However, sometimes it can affect our health.			
Q3_37	Could you please tell me which gambling activities you have taken part in over the last 12 months? - Lotto (including Strike, Powerball and Big Wednesday) - Keno (not in a casino) - Instant Kiwi or other Scratch ticket - Housie (bingo) for money - Horse or dog racing through NZ TAB (excluding office sweepstakes) - Sports betting through NZ TAB - Gaming machines or pokies at a casino - Table games or any other games at a casino - Gaming machines or pokies in a pub or club (not in a casino) - Paying to gamble on overseas websites (not MyLotto or NZ TAB) - Other gambling activity - None of the above	- Yes - No	Multiple
Q3_37_B	Which of those gambling activities do you most prefer?	- Lotto (including Strike, Powerball and Big Wednesday) - Keno (not in a casino) - Instant Kiwi or other Scratch ticket - Housie (bingo) for money - Horse or dog racing through NZ TAB (excluding office sweepstakes) - Sports betting through NZ TAB - Gaming machines or pokies at a casino - Table games or any other games at a casino - Gaming machines or pokies in a pub or club (not in a casino) - Paying to gamble on overseas websites (not MyLotto or NZ TAB) - Other gambling activity - None of the above	Single
Some of the next questions may not apply to you, but please try to be as accurate as possible.			
Q3_38	Thinking about the past 12 months, how often have you bet more than you could really afford to lose?	- Never - Sometimes - Most of the time - Almost always	Single
Q3_39	Thinking about the past 12 months, have you needed to gamble with larger amounts of money to get the same feeling of excitement?	- Never - Sometimes - Most of the time - Almost always	Single
Q3_40	Thinking about the past 12 months, how often have you gone back another day to try to win back the money you lost?	- Never - Sometimes - Most of the time - Almost always	Single
Q3_41	Thinking about the past 12 months, how often have you borrowed money or sold anything to get money to gamble?	- Never - Sometimes - Most of the time - Almost always	Single

Q3_42	Thinking about the past 12 months, how often have you felt that you might have a problem with gambling?	- Never - Sometimes - Most of the time - Almost always	Single
Q3_43	Thinking about the past 12 months, how often have people criticised your betting or told you that you had a gambling problem, regardless of whether or not you thought it was true?	- Never - Sometimes - Most of the time - Almost always	Single
Q3_44	Thinking about the past 12 months, how often have you felt guilty about the way you gamble or what happens when you gamble?	- Never - Sometimes - Most of the time - Almost always	Single
Q3_45	Thinking about the past 12 months, how often has gambling caused you any health problems, including stress or anxiety?	- Never - Sometimes - Most of the time - Almost always	Single
Q3_46	Thinking about the past 12 months, how often has your gambling caused any financial problems for you or your household?	- Never - Sometimes - Most of the time - Almost always	Single
Q3_47	In the last 12 months, have you had problems because of someone else's gambling?	- Yes - No	Single
Q3_48	Can you say what kind of gambling was involved?	- Lotto (including Strike, Powerball and Big Wednesday) - Keno (not in a casino) - Instant Kiwi or other Scratch ticket - Housie (bingo) for money - Horse or dog racing through NZ TAB (excluding office sweepstakes) - Sports betting through NZ TAB - Gaming machines or pokies at a casino - Table games or any other games at a casino - Gaming machines or pokies in a pub or club (not in a casino) - Paying to gamble on overseas websites (not MyLotto or NZ TAB) - Other gambling activity	Multiple

Appendix B   Past year participation in individual gambling activities by demographics

Table 19:   Past year participation in specific types of gambling activities by demographics, total population aged 15 years and over (unadjusted prevalence; N=12,596) [1]

| | | GAMBLING ACTIVITY – PAST YEAR PARTICIPATION [2] | | | | | | | |
| | | Lotto only [3] | | Any non-Lotto gambling activity | | Any gaming machine (casino or non-casino) [5] | | Any casino gambling (tables or gaming machines) [5] | |
		n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)
Total		3,428	27.0 (25.9 - 28.1)	3,121	25.3 (24.1 - 26.4)	1,157	9.1 (8.4 - 9.8)	601	5.4 (4.8 - 5.9)
By Gender	Female	1,955	26.4 (24.9 - 27.9)	1,832	24.3 (22.9 - 25.7)	691	9.0 (8.1 - 9.9)	342	4.9 (4.2 - 5.5)
	Male	1,473	27.7 (26.1 - 29.2)	1,289	26.3 (24.6 - 27.9)	466	9.1 (8.0 - 10.2)	259	5.9 (5.0 - 6.8)
By Age-group	15 - 24	101	7.1 (5.3 - 8.8)	372	25.7 (22.8 - 28.6)	139	8.8 (7.0 - 10.6)	69	5.4 (3.9 - 7.0)
	25 - 34	400	22.1 (19.6 - 24.5)	584	31.9 (29.1 - 34.7)	229	11.9 (10.1 - 13.7)	147	8.4 (6.7 - 10.0)
	35 - 44	707	32.1 (29.6 - 34.5)	585	24.7 (22.3 - 27.1)	202	8.8 (7.2 - 10.5)	108	5.2 (4.0 - 6.4)
	45 - 54	732	36.4 (33.6 - 39.1)	522	24.7 (22.2 - 27.2)	182	7.7 (6.2 - 9.3)	90	4.7 (3.5 - 6.0)
	55 - 64	685	35.5 (32.8 - 38.2)	491	23.7 (21.2 - 26.2)	213	10.0 (8.3 - 11.7)	96	4.9 (3.7 - 6.1)
	65+	803	31.4 (29.2 - 33.6)	567	20.9 (18.9 - 22.9)	192	7.4 (6.1 - 8.6)	91	3.8 (2.9 - 4.7)
By Ethnicity [4]	Māori	655	22.6 (20.7 - 24.5)	753	31.5 (28.9 - 34.1)	324	13.9 (11.9 - 15.8)	131	5.8 (4.5 - 7.1)
	Pacific	208	24.2 (20.9 - 27.5)	211	23.9 (19.7 - 28.0)	93	9.5 (7.1 - 11.9)	53	5.6 (3.5 - 7.7)
	Asian	216	24.8 (20.9 - 28.7)	126	12.3 (9.9 - 14.6)	52	4.8 (3.3 - 6.3)	50	4.8 (3.4 - 6.3)
	European / Other	2,786	25.5 (24.3 - 26.7)	2,510	27.2 (25.8 - 28.6)	896	9.3 (8.5 - 10.2)	469	5.8 (5.1 - 6.5)
By Neighbourhood Deprivation (NZDep2006)	1 (least deprived)	635	30.3 (27.7 - 33.0)	454	23.8 (21.4 - 26.3)	144	7.8 (6.4 - 9.3)	105	6.4 (4.9 - 7.9)
	2	572	29.3 (26.4 - 32.2)	455	24.3 (21.3 - 27.3)	162	8.3 (6.5 - 10.1)	83	4.5 (3.3 - 5.8)
	3	688	27.2 (24.7 - 29.7)	639	26.6 (23.7 - 29.5)	240	9.4 (7.8 - 11.1)	126	5.6 (4.4 - 6.9)
	4	714	25.7 (23.3 - 28.2)	699	25.9 (23.4 - 28.4)	272	10.1 (8.5 - 11.6)	131	5.3 (4.2 - 6.4)
	5 (most deprived)	819	22.2 (20.3 - 24.0)	874	25.7 (23.3 - 28.1)	339	9.8 (8.4 - 11.1)	156	5.0 (4.0 - 6.0)
By Geography	Rural	382	30.4 (27.3 - 33.5)	255	23.1 (19.4 - 26.9)	87	7.0 (5.4 - 8.6)	37	2.8 (1.9 - 3.8)
	Urban	3,034	26.6 (25.4 - 27.8)	2,857	25.5 (24.3 - 26.7)	1,065	9.3 (8.6 - 10.1)	561	5.7 (5.1 - 6.3)

Notes:
1. Source: 2011/12 New Zealand Health Survey.
2. Due to small cell sizes / denominators (n<30), some activities have been combined with others to enable their inclusion in the analyses.
3. Lotto includes 'Strike', 'Powerball', and 'Big Wednesday'.
4. Respondents are counted in each of the ethnic groups that are applicable to them; respondents who identify with more than one ethnic grouping are included in each of the relevant groups. As such, it is inappropriate to compare these ethnic-specific proportions as mutually exclusive categories. Percentages and 95% confidence intervals have been age-standardised in accordance with World Health Organisation (WHO) age population distributions (Ahmad et al., 2001).
5. Analyses were undertaken to report past-year participation on these activities for minors (i.e. those aged 19 or less). Resulting denominators were <30.

		GAMBLING ACTIVITY – PAST YEAR PARTICIPATION (CONTINUED)							
		Lotto [6]		Instant Kiwi or other scratch tickets		Non-casino gaming machines [7]		Track betting	
		n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)
Total		5,693	45.2 (43.8 - 46.7)	1,677	13.6 (12.7 - 14.5)	803	6.1 (5.5 - 6.7)	746	6.1 (5.5 - 6.6)
By Gender	Female	3,274	43.7 (41.9 - 45.4)	1,120	15.2 (14.0 - 16.4)	467	5.9 (5.2 - 6.7)	297	4.2 (3.5 - 4.8)
	Male	2,419	46.9 (45.0 - 48.7)	557	11.9 (10.7 - 13.2)	336	6.2 (5.4 - 7.1)	449	8.0 (7.1 - 9.0)
By Age-group	15 - 17	-	-	<30	-	-	-	-	-
	18 - 24	-	-	226	21.8 (18.5 - 25.1)	-	-	-	-
	15 - 24	268	18.8 (16.1 - 21.4)	240	16.4 (13.9 - 18.8)	106	6.6 (5.0 - 8.2)	46	3.3 (2.1 - 4.5)
	25 - 34	801	44.6 (41.5 - 47.7)	334	17.8 (15.7 - 19.9)	153	7.7 (6.2 - 9.2)	111	7.0 (5.4 - 8.6)
	35 - 44	1,164	52.2 (49.5 - 54.9)	306	12.6 (10.7 - 14.5)	134	5.9 (4.5 - 7.2)	148	6.6 (5.3 - 7.9)
	45 - 54	1,168	57.3 (54.4 - 60.2)	270	12.5 (10.6 - 14.5)	129	4.7 (3.6 - 5.9)	154	8.1 (6.5 - 9.7)
	55 - 64	1,088	55.2 (52.3 - 58.1)	252	11.8 (10.0 - 13.7)	154	7.1 (5.8 - 8.5)	137	6.2 (4.9 - 7.5)
	65+	1,204	46.6 (43.9 - 49.2)	275	10.1 (8.7 - 11.6)	127	4.8 (3.8 - 5.7)	150	5.4 (4.2 - 6.5)
By Ethnicity	Māori	1,200	45.1 (42.5 - 47.7)	409	16.9 (14.8 - 18.9)	246	11.0 (9.2 – 12.7)	137	5.7 (4.5 - 6.9)
	Pacific	342	40.2 (36.1 - 44.3)	99	11.4 (8.4 - 14.5)	60	6.5 (4.4 – 8.6)	30	4.2 (2.4 - 6.0)
	Asian	319	35.2 (31.2 - 39.3)	56	6.2 (4.2 - 8.1)	<30	-	<30	-
	European / Other	4,614	44.5 (42.9 - 46.0)	1,385	15.3 (14.1 - 16.5)	622	6.2 (5.5 – 7.0)	662	6.8 (6.0 - 7.5)
By Neighbourhood Deprivation (NZDep2006)	1 (least deprived)	989	48.5 (44.9 - 52.2)	228	11.6 (9.5 - 13.7)	85	4.5 (3.3 - 5.7)	125	6.7 (5.1 - 8.2)
	2	912	47.3 (43.8 - 50.9)	245	13.1 (10.6 - 15.5)	118	5.9 (4.4 - 7.3)	124	6.3 (4.8 - 7.8)
	3	1,158	46.6 (43.3 - 49.9)	359	15.4 (13.3 - 17.6)	162	5.9 (4.6 - 7.2)	152	6.0 (4.8 - 7.1)
	4	1,209	43.7 (40.8 - 46.7)	386	13.9 (11.7 - 16.0)	193	7.1 (5.6 - 8.5)	176	6.4 (5.1 - 7.7)
	5 (most deprived)	1,425	39.5 (36.7 - 42.2)	459	14.1 (12.2 - 16.0)	245	7.2 (6.0 - 8.4)	169	4.9 (3.8 - 5.9)
By Geography	Rural	574	47.7 (43.1 - 52.3)	141	12.8 (10.0 - 15.6)	60	4.7 (3.2 - 6.2)	68	6.4 (4.4 - 8.5)
	Urban	5,102	44.9 (43.4 - 46.5)	1,531	13.7 (12.7 - 14.7)	741	6.3 (5.6 - 6.9)	678	6.0 (5.4 - 6.6)

Notes:
6. Due to small cell sizes Lotto includes 'Strike', 'Powerball', and 'Big Wednesday'.
7. Analyses were undertaken to report past-year participation on these activities for minors (i.e. those aged 19 or less). Resulting denominators were <30.

		Casino gaming machines		Sports betting		Casino tables		Other form of gambling (including Internet-based gambling)	
		GAMBLING ACTIVITY – PAST YEAR PARTICIPATION (CONTINUED)							
		n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)
Total		499	4.2 (3.7 - 4.7)	278	2.6 (2.2 - 3.1)	178	2.0 (1.6 - 2.3)	161	1.7 (1.3 - 2.0)
By Gender	Female	300	4.2 (3.6 - 4.8)	55	0.5 (0.4 - 0.7)	71	1.2 (0.9 - 1.6)	65	0.8 (0.5 - 1.1)
	Male	199	4.2 (3.5 - 4.9)	223	4.9 (4.0 - 5.7)	107	2.7 (2.1 - 3.3)	96	2.6 (1.9 - 3.2)
By Age-group	15 - 24	54	3.6 (2.4 - 4.7)	<30	-	<30	-	<30	-
	25 - 34	108	5.8 (4.5 - 7.1)	94	5.6 (4.2 - 6.9)	62	4.0 (2.8 - 5.3)	34	2.3 (1.3 - 3.2)
	35 - 44	89	4.2 (3.1 - 5.3)	56	3.1 (2.2 - 4.0)	35	1.8 (1.0 - 2.6)	38	1.9 (1.2 - 2.6)
	45 - 54	75	3.9 (2.8 - 5.0)	40	1.8 (1.1 - 2.6)	<30	-	<30	-
	55 - 64	91	4.4 (3.3 - 5.5)	34	2.2 (1.3 - 3.1)	<30	-	<30	-
	65+	82	3.5 (2.6 - 4.3)	<30	-	<30	-	<30	-
By Ethnicity	Māori	112	4.8 (3.6 - 5.9)	69	3.7 (2.6 - 4.9)	36	2.2 (1.3 - 3.1)	33	1.8 (0.9 - 2.6)
	Pacific	47	4.9 (3.1 - 6.8)	<30	-	<30	-	<30	-
	Asian	34	3.4 (2.2 - 4.7)	<30	-	<30	-	<30	-
	European / Other	392	4.4 (3.8 - 4.9)	234	3.2 (2.6 - 3.8)	142	2.4 (1.8 - 2.9)	128	1.8 (1.4 - 2.3)
By Neighbourhood Deprivation (NZDep2006)	1 (least deprived)	77	4.3 (3.2 - 5.5)	46	3.2 (2.0 - 4.4)	39	2.7 (1.6 - 3.8)	39	2.4 (1.2 - 3.6)
	2	68	3.5 (2.4 - 4.5)	41	1.8 (1.2 - 2.5)	<30	-	<30	-
	3	110	4.8 (3.7 - 5.9)	73	3.2 (2.3 - 4.1)	35	1.7 (1.0 - 2.4)	30	1.2 (0.7 - 1.7)
	4	112	4.3 (3.3 - 5.3)	60	2.9 (1.9 - 3.8)	34	1.8 (1.1 - 2.5)	<30	-
	5 (most deprived)	132	4.1 (3.2 - 5.0)	58	2.1 (1.3 - 2.9)	45	1.9 (1.1 - 2.6)	38	1.3 (0.7 - 1.8)
By Geography	Rural	32	2.5 (1.6 - 3.5)	<30	-	<30	-	<30	-
	Urban	464	4.4 (3.9 - 4.9)	264	2.8 (2.4 - 3.3)	167	2.1 (1.7 - 2.5)	151	1.7 (1.3 - 2.1)

		GAMBLING ACTIVITY – PAST YEAR PARTICIPATION (CONTINUED)			
		Keno (not in a casino)		Housie	
		n	% (95% CI)	n	% (95% CI)
Total		149	0.9 (0.7 - 1.2)	158	0.9 (0.7 - 1.1)
By Gender	Female	93	0.9 (0.7 - 1.2)	136	1.2 (0.9 - 1.5)
	Male	56	1.0 (0.6 - 1.3)	<30	-
By Age-group	15 - 24	<30	-	<30	-
	25 - 34	<30	-	<30	-
	35 - 44	<30	-	<30	-
	45 - 54	<30	-	33	1.1 (0.5 - 1.6)
	55 - 64	38	1.4 (0.9 - 2.0)	<30	-
	65+	<30	-	39	1.0 (0.6 - 1.4)
By Ethnicity	Māori	54	2.1 (1.4 - 2.8)	73	2.5 (1.8 - 3.2)
	Pacific	<30	-	<30	-
	Asian	<30	-	<30	-
	European / Other	94	0.8 (0.5 - 1.0)	85	0.6 (0.4 - 0.8)
By Neighbourhood Deprivation (NZDep2006)	1 (least deprived)	<30	-	<30	-
	2	<30	-	<30	-
	3	<30	-	<30	-
	4	36	1.3 (0.7 - 1.9)	35	0.8 (0.5 - 1.2)
	5 (most deprived)	63	1.7 (1.1 - 2.2)	84	2.2 (1.6 - 2.8)
By Geography	Rural	<30	-	<30	-
	Urban	142	1.0 (0.8 - 1.3)	150	0.9 (0.7 - 1.1)

Appendix C   Past year participation in individual gambling activities by NZHS survey wave

Table 20:   Past year participation in gambling activities by NZHS survey wave, total population aged 15 years and over (adjusted prevalence; 2002/03 NZHS N=12,529, 2006/07 NZHS N=12,488, 2011/12 NZHS N=12,596) [1]

GAMBLING ACTIVITY [2]	NZHS SURVEY WAVE						p-value [3]
	2002/03 (N=12,529)		2006/07 (N=12,488)		2011/12 (N=12,596)		
	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	
Any gambling activity	**8,617**	**65.9 (64.1 - 67.8)**	**8,223**	**60.3 (58.6 - 61.9)**	**6,549**	**45.7 (44.2 - 47.3)**	**<0.0001**
Lotto only	3,379	18.3 (17.3 - 19.4)	3,259	18.4 (17.5 - 19.3)	3,428	19.9 (18.7 - 21.0)	0.0042
Any non-Lotto gambling activity	5,238	47.6 (45.6 - 49.6)	4,964	41.8 (40.2 - 43.4)	3,121	25.9 (24.4 - 27.4)	<0.0001
Any gaming machine (casino or non-casino)	Not available		1,851	16.2 (15.0 - 17.4)	1,157	9.1 (8.2 - 10.1)	<0.0001
Any casino gambling (tables or gaming machines)	859	8.2 (7.3 - 9.1)	1,020	9.0 (8.1 - 9.9)	601	5.6 (4.9 - 6.4)	<0.0001
Lotto (including 'Strike', 'Powerball' and 'Big Wednesday')	7,507	49.4 (47.7 - 51.1)	7,086	45.6 (44.2 - 47.0)	5,693	36.4 (34.9 - 37.9)	<0.0001
Instant Kiwi or other scratch tickets	3,269	32.7 (30.8 - 34.7)	3,180	28.7 (27.2 - 30.2)	1,677	14.9 (13.6 - 16.1)	<0.0001
Non-casino gaming machines	1,576	15.1 (13.7 - 16.6)	1,279	11.1 (10.1 - 12.2)	803	6.4 (5.5 - 7.2)	<0.0001
Track betting	1,257	10.5 (9.4 - 11.6)	1,000	7.8 (6.9 - 8.6)	746	5.3 (4.6 - 5.9)	<0.0001
Casino gaming machines	Not available		905	7.9 (7.0 - 8.7)	499	4.1 (3.5 - 4.7)	<0.0001
Sports betting	354	4.9 (4.1 - 5.7)	581	5.2 (4.5 - 5.9)	278	3.0 (2.4 – 3.6)	<0.0001
Casino tables	Not available		230	2.5 (2.0 - 3.0)	178	2.4 (1.9 - 3.0)	0.58
Other form of gambling (including Internet-based gambling)	116	1.4 (1.0 - 1.9)	62	0.7 (0.4 - 0.9)	161	1.8 (1.3 - 2.2)	<0.0001
Keno (not in a casino)	493	1.9 (1.5 - 2.3)	279	1.5 (1.2 - 1.8)	149	1.0 (0.6 - 1.3)	<0.0001
Housie	526	1.7 (1.3 - 2.1)	274	1.5 (1.1 - 1.9)	158	0.7 (0.5 - 0.9)	<0.0001

Notes:
1. Sources: 2002/03, 2006/07 and 2011/12 New Zealand Health Surveys. Percentages and 95% confidence intervals have been age-standardised in accordance with World Health Organisation (WHO) age population distributions (Ahmad et al., 2001). As such, the 2011/12 past-year gambling rate presented in this table differs slightly to the rate presented in earlier results.
2. Participants could choose more than one activity / response option.
3. Logistic regression analyses have controlled for gender, age, ethnicity, neighbourhood deprivation, and geography (urban/rural).

Appendix D   Number of gambling activities in last 12 months

Table 21:   Number of gambling activities participated in during the last 12 months by demographics, total population aged 15 years and over (unadjusted prevalence; N=12,596) [1]

		NUMBER OF GAMBLING ACTIVITIES IN LAST 12 MONTHS										p-value
		None		One		Two		Three		Four or more		
		n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	
Total		6,047	47.7 (46.3 - 49.1)	4,137	32.8 (31.6 - 34.0)	1,534	12.3 (11.5 - 13.1)	556	4.4 (3.9 - 4.9)	322	2.8 (2.4 - 3.2)	-
By Gender	Male	2,346	46.1 (44.2 - 47.9)	1,743	33.3 (31.6 - 35.0)	617	12.4 (11.2 - 13.6)	233	4.5 (3.8 - 5.2)	169	3.7 (3.0 - 4.5)	<.0001
	Female	3,701	49.3 (47.6 - 51.0)	2,394	32.4 (30.9 - 33.9)	917	12.2 (11.2 - 13.2)	323	4.3 (3.7 - 4.9)	153	1.9 (1.5 - 2.3)	
By Age-group	15 - 17	362	94.9 (92.4 - 97.3)	<30	-	<30	-	<30	-	<30	-	<.0001
	18 - 24	653	55.4 (51.5 - 59.2)	251	25.2 (21.9 - 28.4)	119	10.9 (8.4 - 13.4)	41	4.2 (2.6 - 5.9)	41	4.3 (2.8 - 5.8)	
	25 - 34	974	46.0 (42.9 - 49.2)	540	29.3 (26.5 - 32.1)	252	13.9 (11.9 - 15.9)	121	6.4 (5.0 - 7.8)	71	4.4 (3.2 - 5.5)	
	35 - 44	1,080	43.3 (40.5 - 46.0)	813	35.6 (33.1 - 38.1)	316	13.7 (11.7 - 15.6)	113	5.4 (4.2 - 6.6)	50	2.1 (1.4 - 2.9)	
	45 - 54	870	38.9 (36.1 - 41.8)	808	39.7 (37.0 - 42.5)	285	13.9 (11.8 - 16.0)	102	4.4 (3.4 - 5.5)	59	3.0 (2.0 - 4.0)	
	55 - 64	784	40.8 (37.9 - 43.7)	757	38.6 (35.8 - 41.4)	257	12.9 (11.1 - 14.7)	100	4.7 (3.6 - 5.9)	62	3.0 (2.1 - 4.0)	
	65+	1,324	47.7 (45.1 - 50.3)	950	36.3 (34.0 - 38.6)	302	12.0 (10.4 - 13.7)	79	2.7 (2.0 - 3.5)	39	1.3 (0.8 - 1.8)	
By Ethnicity [2]	Māori	1,178	45.9 (43.2 - 48.6)	831	30.4 (28.1 - 32.7)	346	13.6 (11.8 - 15.4)	136	5.9 (4.6 - 7.1)	95	4.2 (3.1 - 5.3)	<.0001
	Pacific	541	51.9 (47.7 - 56.2)	270	30.5 (27.1 - 33.9)	77	9.2 (6.5 - 12.0)	44	4.3 (2.7 - 5.9)	<30	-	
	Asian	589	62.9 (59.0 - 66.9)	238	26.6 (22.7 - 30.5)	75	7.6 (5.6 - 9.6)	<30	-	<30	-	
	European/ Other	4,624	47.3 (45.7 - 48.9)	3,345	32.2 (30.8 - 33.5)	1,241	12.6 (11.7 - 13.6)	454	4.8 (4.2 - 5.4)	256	3.1 (2.6 - 3.7)	
By Neighbour-hood Deprivation (NZDep2006)	1 (least deprived)	855	45.9 (42.5 - 49.2)	725	35.4 (32.7 - 38.2)	244	11.6 (9.9 - 13.2)	72	4.2 (3.1 - 5.4)	48	2.9 (1.8 - 4.0)	.79
	2	937	46.4 (43.0 - 49.8)	663	34.3 (31.3 - 37.2)	239	12.7 (10.6 - 14.8)	78	4.2 (2.9 - 5.5)	47	2.4 (1.6 - 3.2)	
	3	1,188	46.2 (42.7 - 49.7)	829	33.4 (30.4 - 36.3)	307	12.9 (10.7 - 15.1)	128	5.0 (4.0 - 6.0)	63	2.6 (1.7 - 3.5)	
	4	1,299	48.4 (45.5 - 51.3)	877	31.6 (29.1 - 34.2)	335	12.6 (10.9 - 14.3)	120	4.1 (3.1 - 5.2)	81	3.2 (2.2 - 4.3)	
	5 (most deprived)	1,768	52.1 (49.4 - 54.8)	1,043	29.1 (27.2 - 31.0)	409	11.6 (10.0 - 13.2)	158	4.5 (3.5 - 5.4)	83	2.7 (2.0 - 3.5)	
By Geography	Rural	639	46.5 (41.8 - 51.2)	435	35.4 (31.9 - 38.8)	142	13.5 (10.6 - 16.4)	45	3.7 (2.4 - 5.0)	<30	-	.0013
	Urban	5,386	47.9 (46.4 - 49.3)	3687	32.5 (31.3 - 33.8)	1,387	12.1 (11.2 - 12.9)	510	4.5 (4.0 - 5.0)	307	3.0 (2.6 - 3.5)	

Notes:
1.   Source: 2011/12 New Zealand Health Survey.
2.   Respondents are counted in each of the ethnic groups that are applicable to them; respondents who identify with more than one ethnic grouping are included in each of the relevant groups. As such, it is inappropriate to compare these ethnic-specific proportions as mutually exclusive categories. Percentages and 95% confidence intervals have been age-standardised in accordance with World Health Organisation (WHO) age population distributions (Ahmad et al., 2001).

Appendix E   Preferred gambling activity

Table 22: Preferred gambling activity by demographics, past-year gamblers (unadjusted prevalence; N=6,549) [1] [2]

		PREFERRED GAMBLING ACTIVITY							
		Lotto [3]		Instant Kiwi or other scratch tickets		Track betting		Sports betting	
		n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)
Total		1,027	43.8 (41.2 - 46.4)	395	18.4 (16.3 - 20.5)	259	11.5 (9.9 - 13.2)	76	4.3 (3.1 - 5.4)
By Gender	Female	613	44.0 (40.5 - 47.6)	302	26.5 (23.2 - 29.8)	83	7.1 (5.2 - 8.9)	<30	-
	Male	414	43.6 (40.0 - 47.3)	93	10.6 (8.3 - 13.0)	176	15.8 (13.1 - 18.5)	69	8.0 (5.8 - 10.2)
By Age-group	15 - 24	48	29.2 (20.2 - 38.2)	68	32.7 (24.3 - 41.0)	<30	-	<30	-
	25 - 34	140	33.3 (27.9 - 38.7)	103	23.0 (18.1 - 27.9)	35	10.3 (6.2 - 14.3)	32	8.2 (5.0 - 11.4)
	35 - 44	240	52.2 (46.7 - 57.7)	70	14.1 (10.3 - 18.0)	37	9.4 (6.2 - 12.7)	<30	-
	45 - 54	221	51.4 (45.3 - 57.4)	52	13.9 (9.6 - 18.2)	58	14.8 (10.4 - 19.2)	<30	-
	55 - 64	203	54.1 (47.8 - 60.5)	47	13.3 (8.4 - 18.3)	52	12.2 (8.5 - 15.9)	<30	-
	65+	175	40.9 (34.4 - 47.4)	55	15.4 (10.9 - 20.0)	66	17.8 (13.1 - 22.6)	<30	-
By Ethnicity [4]	Māori	269	49.0 (43.4 - 54.5)	86	16.1 (12.1 - 20.2)	38	6.6 (4.3 - 9.0)	<30	-
	Pacific	64	40.2 (31.5 - 48.9)	<30	-	<30	-	<30	-
	Asian	51	56.5 (46.9 - 66.2)	<30	-	<30	-	<30	-
	European / Other	811	40.9 (37.6 - 44.2)	333	21.6 (18.7 - 24.5)	224	11.3 (9.5 - 13.1)	63	4.5 (3.2 - 5.7)
By Neighbourhood Deprivation (NZDep2006)	1 (least deprived)	163	45.4 (38.8 - 52.0)	51	16.8 (11.5 - 22.1)	41	11.6 (8.2 - 14.9)	<30	-
	2	149	43.2 (37.4 - 49.1)	58	18.6 (13.8 - 23.4)	47	14.0 (9.4 - 18.6)	<30	-
	3	220	48.0 (42.5 - 53.4)	90	19.1 (14.5 - 23.7)	43	9.8 (6.0 - 13.7)	<30	-
	4	218	40.9 (35.3 - 46.4)	83	16.1 (11.8 - 20.4)	64	12.4 (9.2 - 15.7)	<30	-
	5 (most deprived)	277	41.2 (35.8 - 46.6)	113	21.7 (17.2 - 26.3)	64	9.8 (6.7 - 12.8)	<30	-
By Geography	Rural	90	50.6 (40.3 - 61.0)	<30	-	<30	-	<30	-
	Urban	934	42.9 (40.3 - 45.5)	365	18.8 (16.5 - 21.0)	233	11.0 (9.4 - 12.5)	72	4.5 (3.3 - 5.8)

Notes:
1. Source: 2011/12 New Zealand Health Survey.
2. Due to small cell sizes / denominators (n<30), some activities have been combined with others to enable their inclusion in the analyses.
3. Lotto includes 'Strike', 'Powerball', 'Big Wednesday' and 'Keno'.
4. Respondents are counted in each of the ethnic groups that are applicable to them; respondents who identify with more than one ethnic grouping are included in each of the relevant groups. As such, it is inappropriate to compare these ethnic-specific proportions as mutually exclusive categories. Percentages and 95% confidence intervals have been age-standardised in accordance with World Health Organisation (WHO) age population distributions (Ahmad et al., 2001).

		PREFERRED GAMBLING ACTIVITY (CONTINUED)					
		Casino tables or machines		Non-casino gaming machines		Other form of gambling (including Internet-based gambling & Housie)	
		n	% (95% CI)	n	% (95% CI)	n	% (95% CI)
Total		174	9.3 (7.8 - 10.9)	201	8.5 (7.0 - 10.0)	97	4.1 (3.1 - 5.2)
By Gender	Female	99	8.9 (6.8 - 10.9)	132	10.0 (7.8 - 12.2)	61	3.1 (2.2 - 4.1)
	Male	75	9.7 (7.2 - 12.2)	69	7.1 (5.1 - 9.0)	36	5.1 (3.2 - 7.1)
By Age-group	15 - 24	<30	-	<30	-	<30	-
	25 - 34	52	13.8 (9.7 - 18.0)	38	8.1 (5.0 - 11.3)	<30	-
	35 - 44	34	8.6 (5.1 - 12.1)	<30	-	<30	-
	45 - 54	<30	-	33	7.1 (3.8 - 10.5)	<30	-
	55 - 64	<30	-	42	9.7 (6.2 - 13.3)	<30	-
	65+	<30	-	35	10.8 (6.5 - 15.1)	<30	-
By Ethnicity	Māori	41	9.6 (6.0 - 13.2)	58	11.3 (7.6 - 14.9)	30	4.3 (2.5 - 6.1)
	Pacific	<30	-	<30	-	<30	-
	Asian	<30	-	<30	-	<30	-
	European / Other	135	9.5 (7.5 - 11.4)	166	8.2 (6.5 - 9.9)	62	4.0 (2.7 - 5.4)
By Neighbourhood Deprivation (NZDep2006)	1 (least deprived)	34	11.9 (7.8 - 15.9)	<30	-	<30	-
	2	<30	-	30	8.5 (4.5 - 12.5)	<30	-
	3	31	7.3 (4.3 - 10.2)	37	6.5 (3.8 - 9.2)	<30	-
	4	45	11.9 (7.9 - 15.9)	49	10.9 (7.2 - 14.6)	<30	-
	5 (most deprived)	41	9.2 (5.9 - 12.6)	65	10.9 (7.6 - 14.1)	33	4.1 (2.4 - 5.7)
By Geography	Rural	<30	-	<30	-	<30	-
	Urban	161	9.8 (8.1 - 11.5)	188	8.8 (7.2 - 10.4)	91	4.3 (3.1 - 5.4)

Appendix F   Changes over time – comparison of 2002/03, 2006/07 and 2011/12 NZHS: Prevalence of problem gambling

Table 23:   Gambling Status (PGSI categorisation), by NZHS survey wave, total population aged 15 years and over (adjusted prevalence; 2002/03 NZHS N=12,529, 2006/07 NZHS N=12,488, 2011/12 NZHS N=12,596) [1]

| PGSI CATEGORISATION | NZHS SURVEY WAVE | | | | | | p-value [2] |
| | 2002/03 (N=12,529) | | 2006/07 (N=12,488) | | 2011/12 (N=12,596) | | |
	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	
Non-gambler	Not available		4,264	39.7 (38.1 - 41.4)	6,047	54.3 (52.7 - 55.8)	
Non-problem / Recreational	Not available		7,397	54.7 (53.0 - 56.3)	6,092	42.3 (40.8 - 43.9)	
Low-risk	Not available		502	3.7 (3.2 - 4.3)	272	2.1 (1.6 - 2.6)	
Moderate-risk	Not available		238	1.4 (1.0 - 1.8)	144	1.0 (0.8 - 1.3)	<0.0001
Problem	Not available		85	0.4 (0.3 - 0.5)	39	0.2 (0.1 – 0.4)	
Combined moderate-risk and problem	Not available		323	1.8 (1.4 - 2.2)	183	1.3 (1.0 - 1.6)	

Notes:
1. Sources: 2002/03, 2006/07 and 2011/12 New Zealand Health Surveys. Percentages and 95% confidence intervals have been age-standardised in accordance with World Health Organisation (WHO) age population distributions (Ahmad et al., 2001).
2. Logistic regression analyses have controlled for gender, age, ethnicity, neighbourhood deprivation, and geography (urban/rural).

Appendix G Gambling status (PGSI categorisation) by demographics

Table 24: Gambling status (PGSI categorisation) by demographics, total population aged 15 years and over (unadjusted prevalence; N=12,594) [1]

		GAMBLING STATUS							Combined moderate-risk and problem	p-value [3]
		Non-gambler		Non-problem / Recreational		Low-risk		Combined moderate-risk and problem [2]			
		n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	Odds ratio (95% CI)	
Total		6,047	47.7 (46.4 - 49.1)	6,092	49.1 (47.7 - 50.5)	272	2.0 (1.6 - 2.3)	183	1.2 (1.0 - 1.5)	-	-
By Gender	Male	2,346	46.1 (44.2 - 47.9)	2,550	50.1 (48.2 - 52.0)	120	2.2 (1.7 - 2.7)	91	1.6 (1.2 - 2.0)	1.8 (1.2 – 2.7)	0.0023
	Female	3,701	49.3 (47.6 - 51.0)	3,542	48.1 (46.4 - 49.8)	152	1.7 (1.3 - 2.1)	92	0.9 (0.6 - 1.2)	1	
By Age-group	15 - 24	1,017	67.4 (64.4 - 70.3)	419	29.4 (26.5 - 32.3)	32	2.2 (1.2 - 3.2)	<30	-	1.7 (0.8 - 3.8)	0.0046
	25 - 34	964	46.0 (42.9 - 49.2)	889	49.7 (46.5 - 52.9)	49	2.3 (1.5 - 3.0)	39	2.0 (1.2 - 2.8)	3.4 (1.6 - 7.3)	
	35 - 44	1,079	42.9 (40.3 - 45.5)	1,201	53.3 (50.7 - 56.0)	65	2.4 (1.6 - 3.2)	34	1.3 (0.7 - 1.9)	2.7 (1.3 - 5.8)	
	45 - 54	885	39.5 (36.7 - 42.4)	1,157	57.3 (54.5 - 60.2)	43	1.5 (0.9 - 2.1)	45	1.6 (0.9 - 2.3)	3.6 (1.8 - 7.3)	
	55 - 64	787	40.7 (37.9 - 43.6)	1,099	55.7 (52.9 - 58.5)	56	2.6 (1.7 - 3.4)	<30	-	2.3 (1.1 - 5.0)	
	65+	1,314	47.5 (44.9 - 50.2)	1,327	51.2 (48.5 - 53.8)	<30	-	<30	-	1	
By Ethnicity [4]	Māori	1,178	45.9 (43.2 - 48.6)	1,221	47.2 (44.6 - 49.7)	101	3.6 (2.7 - 4.5)	85	3.3 (2.4 - 4.2)	3.2 (2.1 – 4.9)	<.0001 [5]
	Pacific	541	51.9 (47.7 - 56.2)	347	39.4 (35.5 - 43.4)	38	5.1 (3.0 - 7.1)	34	3.6 (2.2 - 5.0)	3.0 (1.6 – 5.7)	
	Asian	589	62.9 (59.0 - 66.9)	316	34.1 (30.1 - 38.0)	<30	-	<30	-	0.9 (0.4 – 2.5)	
	European / Other	4,624	47.3 (45.7 - 48.9)	5,021	49.9 (48.4 - 51.6)	174	1.8 (1.4 - 2.1)	100	1.0 (0.7- 1.3)	1	
By Neighbourhood Deprivation (NZDep2006)	1 (least deprived)	855	45.9 (42.5 - 49.2)	1,062	52.6 (49.2 - 55.9)	<30	-	<30	-	1	0.0084
	2	937	46.4 (43.0 - 49.8)	987	51.5 (48.1 - 54.9)	<30	-	<30	-	2.6 (0.9 – 7.5)	
	3	1,188	46.2 (42.7 - 49.7)	1,258	50.9 (47.3 - 54.5)	43	1.7 (1.1 - 2.4)	<30	-	3.5 (1.2 – 9.6)	
	4	1,299	48.4 (45.5 - 51.4)	1,303	47.8 (45.0 - 50.6)	64	2.4 (1.5 - 3.2)	45	1.4 (0.8 - 2.0)	3.6 (1.3 – 9.7)	
	5 (most deprived)	1,768	52.1 (49.4 - 54.8)	1,482	42.0 (39.5 - 44.5)	120	3.4 (2.6 - 4.2)	90	2.5 (1.9 - 3.2)	5.0 (1.9 – 12.9)	
By Geography	Rural	639	46.5 (41.8 - 51.2)	619	52.3 (47.5 - 57.0)	<30	-	<30	-	0.4 (0.1 – 1.0)	0.04
	Urban	5,386	47.9 (46.4 - 49.3)	5,455	48.7 (47.3 - 50.2)	261	2.1 (1.7 - 2.4)	174	1.3 (1.1 - 1.6)	1	

Notes:
1. Source: 2011/12 New Zealand Health Survey.
2. Due to small cell sizes/denominators (n<30), the 'problem' and 'moderate-risk' categories have been combined to enable their inclusion in these analyses.
3. Logistic regression analyses have controlled for gender, age, ethnicity, neighbourhood deprivation, and geography (urban/rural).
4. Respondents are counted in each of the ethnic groups that are applicable to them; respondents who identify with more than one ethnic grouping are included in each of the relevant groups. As such, it is inappropriate to compare these ethnic-specific proportions as mutually exclusive categories. Percentages and 95% confidence intervals have been age-standardised in accordance with World Health Organisation (WHO) age population distributions (Ahmad et al., 2001).
5. Based on prioritised ethnic reporting.

Table 25: Gambling status - changes over time - comparison of 2006/07 NZHS and 2011/12 NZHS, by ethnicity, total population aged 15 years and over (adjusted prevalence; 2002/03 NZHS N=12,529, 2006/07 NZHS N=12,488, 2011/12 NZHS N=12,596) [1]

ETHNICITY	GAMBLING STATUS	NZHS SURVEY WAVE						p-value [2]
		2002/03 (N=12,529)		2006/07 (N=12,488)		2011/12 (N=12,596)		
		n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	
Māori	Non-gambler	Not available		868	31.2 (28.7 - 33.6)	1,178	51.4 (48.3 - 54.4)	<0.0001
	Non-problem / recreational gambler	Not available		1,890	57.5 (55.0 - 60.1)	1,221	41.6 (38.8 - 44.4)	
	Low-risk gambler	Not available		225	6.7 (5.4 - 7.9)	101	4.7 (2.5 - 4.7)	
	Moderate-risk / problem gambler	Not available		177	4.7 (3.7 - 5.6)	85	3.3 (2.2 - 4.4)	
Pacific	Non-gambler	Not available		376	50.0 (45.7 - 54.2)	480	58.2 (53.7 - 62.7)	
	Non-problem / recreational gambler	Not available		435	40.4 (36.2 - 44.7)	308	34.2 (30.1 - 38.2)	
	Low-risk gambler	Not available		59	5.3 (3.6 - 7.0)	31	4.3 (2.4 - 6.2)	
	Moderate-risk / problem gambler	Not available		48	4.4 (2.9 - 5.8)	30	3.4 (1.5 - 5.2)	
Asian	Non-gambler	Not available		801	59.1 (55.9 - 62.3)	561	66.9 (62.8 - 71.1)	
	Non-problem / recreational gambler	Not available		600	35.9 (32.8 - 39.1)	283	30.1 (26.0 - 34.2)	
	Low-risk gambler	Not available		36	3.2 (1.6 - 4.8)	16	2.3 (0.7 - 4.0)	
	Moderate-risk / problem gambler	Not available		<30	-	<30	-	
European / Other	Non-gambler	Not available		2,219	37.5 (35.2 - 39.7)	3,828	52.2 (50.2 - 54.3)	
	Non-problem / recreational gambler	Not available		4,472	58.1 (55.8 - 60.4)	4,280	45.5 (43.5 - 47.6)	
	Low-risk gambler	Not available		182	3.1 (2.4 - 3.9)	124	1.5 (1.0 - 2.0)	
	Moderate-risk / problem gambler	Not available		73	1.3 (0.7 - 1.9)	62	0.7 (0.5 - 1.0)	

Notes:
1. Sources: 2002/03, 2006/07 and 2011/12 New Zealand Health Surveys. NB: Percentages and 95% confidence intervals have been age-standardised in accordance with World Health Organisation (WHO) age population distributions (Ahmad et al., 2001). As such, the results presented here differ slightly to those presented earlier in Table 7.
2. Logistic regression analysis has controlled for gender, age, neighbourhood deprivation, and geography (urban/rural).

Appendix H   Socio-demographics and gambling

Table 26:   Socio-demographics and gambling status (PGSI categorisation), total population aged 15 years and over (unadjusted prevalence) [1]

VARIABLE	TOTAL ADULT POPULATION		GAMBLING STATUS							
			Non-gambler		Non-problem / recreational		Low-risk		Combined Moderate-risk and Problem [2]	
	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)	n	% (95% CI)
HIGHEST LEVEL OF EDUCATION (N=12,536):										
- No secondary school qualifications	2,653	17.1 (16.1 - 18.1)	1,361	53.0 (50.4 - 55.5)	1,161	42.8 (40.3 - 45.4)	80	2.6 (1.8 - 3.4)	49	1.6 (1.0 - 2.2)
- Secondary school qualifications	2,624	21.8 (20.6 - 23.0)	1,366	53.4 (50.6 - 56.1)	1,183	44.1 (41.4 - 46.9)	36	1.4 (0.8 - 1.9)	39	1.1 (0.6 - 1.5)
- Post-secondary school qualifications [3]	7,259	61.0 (59.6 - 62.5)	3,285	44.2 (42.5 - 45.9)	3,724	52.6 (50.9 - 54.4)	155	2.0 (1.6 - 2.4)	95	1.2 (0.9 - 1.5)
EMPLOYMENT STATUS (N=12,370):										
- Employed	7,015	62.1 (60.7 - 63.4)	2,917	40.8 (39.0 - 42.6)	3,831	55.7 (53.9 - 57.5)	153	2.1 (1.7 - 2.6)	114	1.4 (1.0 - 1.7)
- Unemployed	721	5.5 (4.9 - 6.1)	416	59.3 (54.3 - 64.2)	248	34.3 (29.5 - 39.0)	31	3.0 (1.6 - 4.5)	26	3.4 (1.7 - 5.1)
- Not in labour force	4,634	32.4 (31.1 - 33.7)	2,585	58.4 (56.4 - 60.3)	1,923	39.6 (37.6 - 41.5)	84	1.5 (1.0 - 1.9)	40	0.6 (0.3 - 0.9)
LENGTH OF TIME LIVING IN NEW ZEALAND (FOR THOSE BORN OUTSIDE OF NZ) (N=2,901):										
- Has lived in NZ for ≤ 5 years	517	20.6 (18.5 - 22.6)	369	69.3 (64.5 - 74.1)	135	28.5 (23.8 - 33.3)	<30	-	<30	-
- Has lived in NZ for ≥ 6 years	2,384	79.4 (77.4 - 81.5)	1,311	53.6 (50.8 - 56.4)	997	43.3 (40.5 - 46.1)	42	1.8 (1.1 - 2.6)	34	1.2 (0.7 - 1.8)
RESIDENT OF CHRISTCHURCH AT TIME OF THE 22 FEBRUARY 2011 EARTHQUAKE (N=12,494):										
- Yes	1,043	12.4 (10.4 - 14.4)	405	42.1 (38.0 - 46.2)	606	55.7 (51.5 - 59.9)	<30	-	<30	-
- No	11,451	87.6 (85.6 - 89.6)	5,589	48.5 (47.0 - 50.0)	5,441	48.2 (46.7 - 49.7)	253	2.0 (1.7 - 2.4)	166	1.3 (1.0 - 1.5)

Notes:
1. Source: 2011/12 New Zealand Health Survey.
2. Due to small cell sizes / denominators (n<30), the 'problem' and 'moderate-risk' categories have been combined to enable their inclusion in these analyses.
3. Post-secondary school qualifications were defined as including: National Certificate level 1 - level 4; Trade certificate; Diploma or Certificate level 5; Advanced Trade Certificate; Diploma or Certificate level 6; Teachers Certificate/Diploma; Nursing Diploma; Bachelor; Bachelor Hons; Postgraduate Certificate/Diploma; Masters Degree; PhD; Other.

Table 27: *Gambling status by socio-demographics, total population aged 15 years and over - Odds ratios and p-values [1]*

	GAMBLING STATUS			p-value [4]
	People with no gambling problems [2]	Low-risk	Combined moderate-risk and problem [3]	
	Odds ratio	Odds ratio (95% CI)	Odds ratio (95% CI)	
HIGHEST LEVEL OF EDUCATION	1	1.1 (0.8 - 1.6)	1.1 (0.7 - 1.6)	0.74
EMPLOYMENT STATUS: LEVEL OF EMPLOYMENT	1	1.2 (0.8 - 1.8)	1.3 (0.8 - 2.2)	0.36
LENGTH OF TIME LIVING IN NEW ZEALAND [5]: NZ RESIDENT FOR ≤ 5 YEARS	1	1.0 (0.5 - 2.2)	6.4 (1.2 - 32.4)	0.08
RESIDENT OF CHRISTCHURCH AT TIME OF THE 22 FEBRUARY 2011 EARTHQUAKE	1	0.7 (0.4 - 1.2)	1.0 (0.5 - 2.0)	0.44

Notes:
1. Source: 2011/12 New Zealand Health Survey.
2. 'People with no gambling problems' have been defined as non-gamblers and recreational gamblers.
3. Due to small cell sizes / denominators (n<30), the 'problem' and 'moderate-risk' categories have been combined to enable their inclusion in these analyses.
4. Logistic regression analyses have controlled for gender, age, ethnicity, neighbourhood deprivation, and geography (urban/rural).
5. Applies only to those born outside of New Zealand.

Appendix I   Dangerous consumptions and gambling

Table 28:   Dangerous consumptions and gambling status (PGSI categorisation), total population aged 15 years and over (unadjusted prevalence) [1]

VARIABLE	TOTAL ADULT POPULATION		GAMBLING STATUS							
			Non-gambler		Non-problem / recreational		Low-risk		Combined moderate-risk and problem [2]	
	n (N)	% (95% CI)	n (N)	% (95% CI)	n (N)	% (95% CI)	n (N)	% (95% CI)	n (N)	% (95% CI)
ALCOHOL:										
- Use of alcohol in the past 12 months	**9,636 (12,583)**	**79.5 (78.4 - 80.6)**	4,131 (9,635)	71.2 (69.5 - 72.8)	5,132 (9,635)	87.2 (86.1 - 88.4)	224 (9,635)	86.3 (81.3 - 91.3)	148 (9,635)	84.3 (77.5 - 91.1)
- Hazardous drinking (AUDIT score of ≥8)	**1,759 (12,393)**	**15.1 (14.1 - 16.1)**	687 (1,759)	11.8 (10.6 - 13.0)	903 (1,759)	16.6 (15.2 - 18.0)	92 (1,759)	33.4 (26.2 - 40.6)	77 (1,759)	50.6 (40.6 - 60.7)
- Alcohol dependence (AUDIT score of ≥13)	**630 (12,596)**	**4.8 (4.3 - 5.4)**	280 (12,594)	4.2 (3.5 - 4.8)	262 (12,594)	4.6 (3.8 - 5.4)	38 (12,594)	10.7 (6.6 - 14.9)	50 (12,594)	29.2 (20.6 - 37.9)
TOBACCO / SMOKING:										
- Current smoker [3]	**2,780 (12,561)**	**18.4 (17.4 - 19.3)**	1,207 (2,779)	16.2 (14.9 - 17.5)	1,336 (2,779)	18.5 (17.2 - 19.8)	126 (2,779)	42.8 (35.1 - 50.5)	110 (2,779)	57.0 (47.2 - 66.7)
DRUG USE:										
- Have used drugs in the past 12 months [4]	**1,108 (12,596)**	**8.9 (8.2 - 9.7)**	508 (1,107)	8.2 (7.2 - 9.3)	490 (1,107)	8.5 (7.5 - 9.5)	61 (1,107)	21.5 (15.2 - 27.8)	48 (1,107)	31.4 (21.9 - 40.9)
- Cannabis (marijuana/hash/hash oil)	**1,027 (12,596)**	**8.1 (7.4 - 8.8)**	483 (1,026)	7.8 (6.8 - 8.8)	443 (1,026)	7.6 (6.6 - 8.5)	56 (1,026)	19.9 (13.8 - 25.9)	44 (1,026)	25.0 (16.5 - 33.5)
- Other [5]	**324 (12,596)**	**3.0 (2.5 - 3.4)**	141	2.6 (2.0 - 3.1)	145	2.8 (2.3 - 3.4)	<30	-	<30	-

Notes:
1. Source: 2011/12 New Zealand Health Survey.
2. Due to small cell sizes / denominators (n<30), the 'problem' and 'moderate-risk' categories have been combined to enable their inclusion in these analyses.
3. Identifies as a current smoker - as defined by the WHO: smoked at least 100 cigarettes in life time and smoking daily, weekly or monthly.
4. This excludes alcohol and tobacco and allowed for multiple responses.
5. 'Other' includes: Ecstasy; Amphetamines, Legal party pills, Stimulants, Painkillers, Benzodiazepines, Hallucinogens, Cocaine, Heroin, Other. These items have been combined due to small cell sizes / denominators (n<30).

Table 29: Gambling status by dangerous consumptions, total population aged 15 years and over – Odds ratios and p-values [1]

VARIABLE	GAMBLING STATUS			p-value [4]
	People with no gambling problems [2]	Low-risk	Combined moderate-risk and problem [3]	
	Odds ratio	Odds ratio (95% CI)	Odds ratio (95% CI)	
ALCOHOL:				
- Use of alcohol in the past 12 months	1	1.9 (1.2 - 2.9)	1.6 (1.0 - 2.8)	0.0051
- Hazardous drinking (AUDIT score of ≥8)	1	2.8 (1.9 - 4.1)	4.7 (2.9 - 7.7)	<0.0001
- Alcohol dependence (AUDIT score of ≥13)	1	2.0 (1.3 - 3.3)	6.3 (3.8 - 10.5)	<0.0001
TOBACCO / SMOKING:				
- Current smoker [5]	1	3.0 (2.1 - 4.2)	4.2 (2.7 - 6.5)	<0.0001
DRUG USE:				
- Have used drugs in the past 12 months [6]	1	2.7 (1.8 - 4.2)	3.7 (2.2 - 6.4)	<0.0001
- Cannabis (marijuana, hash, hash oil)	1	2.6 (1.7 - 4.1)	2.7 (1.5 - 4.8)	<0.0001
- Other [7]	1	2.7 (1.5 - 4.8)	6.9 (3.5 - 13.7)	<0.0001

Notes:
1. Source: 2011/12 New Zealand Health Survey.
2. 'People with no gambling problems' have been defined as non-gamblers and recreational gamblers.
3. Due to small cell sizes / denominators (n<30), the 'problem' and 'moderate-risk' categories have been combined to enable their inclusion in these analyses.
4. Logistic regression analyses have controlled for gender, age-group, prioritised ethnic group, neighbourhood deprivation and geography (urban/rural).
5. Identifies as a current smoker - as defined by the WHO: smoked at least 100 cigarettes in life time and smoking daily, weekly or monthly.
6. Have used drugs (apart from alcohol and tobacco) for recreational purposes or to get high in the past 12 months. This item allowed for multiple responses.
7. 'Other' includes: ecstasy, amphetamines, legal party pills, stimulants, painkillers, benzodiazepines, hallucinogens, cocaine, heroin, and other.

Appendix J   Health and gambling

Table 30:   Health status and gambling status (PGSI categorisation), total population aged 15 years and over (unadjusted prevalence) [1]

VARIABLE	TOTAL ADULT POPULATION		GAMBLING STATUS							
			Non-gambler		Non-problem / recreational		Low-risk		Combined moderate-risk and problem [2]	
	n (N=12,596)	Mean (95% CI)	n (N=6,047)	Mean (95% CI)	n (N=6,092)	Mean (95% CI)	n (N=272)	Mean (95% CI)	n (N=183)	Mean (95% CI)
SF-12 HEALTH SURVEY:										
- Physical Component Summary (PCS)	12,378	50.3 (50.0 - 50.5)	5,933	50.4 (50.1 - 50.7)	6,004	50.3 (50.0 - 50.7)	265	47.0 (45.5 - 48.5)	175	48.9 (46.9 - 50.9)
- Mental Component Summary (MCS)	12,378	48.2 (48.1 - 48.4)	5,933	51.2 (50.9 - 51.5)	6,004	51.5 (51.2 - 51.8)	265	51.0 (49.6 - 52.3)	175	43.1 (40.5 - 45.7)
- Physical functioning (PF)	12,525	87.6 (86.9 - 88.2)	6,013	87.1 (86.2 - 88.0)	6,061	88.3 (87.5 - 89.2)	268	81.5 (77.2 - 85.9)	181	86.9 (82.4 - 91.3)
- Role physical (RF)	12,570	87.4 (86.8 - 88.0)	6,032	87.5 (86.7 - 88.3)	6,084	87.7 (87.0 - 88.5)	270	80.3 (76.6 - 84.1)	182	78.4 (72.8 - 84.0)
- Bodily pain (BP)	12,582	86.8 (86.3 - 87.4)	6,037	87.6 (86.8 - 88.4)	6,088	86.6 (85.8 - 87.3)	272	79.9 (75.5 - 84.2)	183	78.5 (72.7 - 84.2)
- General health (GH)	12,575	73.0 (72.4 - 73.7)	6,029	73.5 (72.6 - 74.4)	6,090	73.2 (72.4 - 74.0)	272	65.8 (62.2 - 69.4)	182	60.4 (54.9 - 66.0)
- Vitality (VT)	12,563	61.1 (60.5 - 61.8)	6,030	61.7 (60.8 - 62.6)	6,078	60.9 (60.1 - 61.7)	271	60.4 (57.0 - 63.8)	183	49.7 (44.2 - 55.2)
- Social functioning (SF)	12,576	92.1 (91.6 - 92.6)	6,036	91.7 (91.0 - 92.4)	6,085	92.9 (92.3 - 93.6)	272	89.1 (86.2 - 91.9)	182	79.1 (72.3 - 85.8)
- Role emotional (RE)	12,549	94.0 (93.6 - 94.3)	6,014	93.6 (93.1 - 94.1)	6,081	94.8 (94.3 - 95.2)	272	92.5 (90.3 - 94.6)	181	79.7 (74.9 - 84.6)
- Mental health (MH)	12,547	78.0 (77.6 - 78.4)	6,023	77.9 (77.3 - 78.5)	6,072	78.4 (77.9 - 78.9)	270	76.9 (74.2 - 79.6)	181	67.8 (63.7 - 72.0)
VARIABLE	n (N)	% (95% CI)	n (N)	% (95% CI)	n (N)	% (95% CI)	n (N)	% (95% CI)	n (N)	% (95% CI)
- General Health self-rated as fair/poor	1,643 (12,576)	10.7 (10.0 - 11.4)	797 (1,643)	10.6 (9.6 - 11.6)	743 (1,643)	10.2 (9.2 - 11.2)	50 (1,643)	14.6 (9.9 - 19.2)	53 (1,643)	27.0 (18.4 - 35.5)
- K10 – high/very high probability of anxiety or depressive disorder	827 (12,564)	5.6 (5.0 - 6.1)	410 (827)	5.8 (5.0 - 6.6)	324 (827)	4.6 (3.9 - 5.3)	46 (827)	11.7 (7.5 - 15.8)	47 (827)	28.2 (19.0 - 37.4)
- Common mental disorder (depression/bi-polar/anxiety)	2,273 (12,559)	16.2 (15.3 - 17.1)	1,081 (2,273)	15.7 (14.5 - 17.0)	1,080 (2,273)	16.2 (15.0 - 17.4)	59 (2,273)	18.5 (12.3 - 24.8)	53 (2,273)	30.8 (21.5 - 40.0)
- Depression	2,011 (12,580)	14.2 (13.4 - 15.1)	961 (2,011)	13.9 (12.7 - 15.1)	949 (2,011)	14.1 (13.0 - 15.3)	53 (2,011)	14.9 (10.0 - 19.8)	48 (2,011)	29.5 (20.3 - 38.8)
- Bi-polar disorder	143 (12,575)	0.9 (0.7 - 1.0)	81 (143)	1.0 (0.7 - 1.3)	52 (143)	0.7 (0.4 - 0.9)	<30	-	<30	-
- Anxiety disorder	843 (12,584)	6.1 (5.5 - 6.7)	386 (843)	6.0 (5.1 - 6.8)	411 (843)	6.1 (5.2 - 6.9)	28 (843)	9.3 (4.4 - 14.3)	18 (843)	10.2 (4.1 - 16.3)

Notes: 1. Source: 2011/12 New Zealand Health Survey.

2. Due to small cell sizes / denominators (n<30), the 'problem' and 'moderate-risk' categories have been combined to enable their inclusion in these analyses.

Table 31: *Gambling status by health status, total population aged 15 years and over – Odds ratios and p-values* [1]

VARIABLE	GAMBLING STATUS			p-value [4]
	People with no gambling problems [2]	Low-risk	Combined moderate-risk and problem [3]	
	Odds ratio	Odds ratio (95% CI)	Odds ratio (95% CI)	
- General health self-rated as fair/poor	1	1.3 (0.9 - 1.9)	2.5 (1.6 - 4.0)	0.0003
- Kessler 10-item scale (K10) – high/very high probability of anxiety or depressive disorder	1	2.1 (1.4 - 3.2)	5.7 (3.5 - 9.4)	<0.0001
- Common mental disorder (depression/bi-polar/anxiety)	1	1.3 (0.8 - 1.9)	2.7 (1.8 - 4.2)	<0.0001
- Depression	1	1.1 (0.8 - 1.6)	3.0 (1.9 - 4.7)	<0.0001
- Bi-polar disorder	1	1.0 (0.2 - 4.2)	1.7 (0.7 - 4.2)	0.53
- Anxiety disorder	1	1.6 (0.9 - 3.0)	1.8 (0.9 - 3.5)	0.11

Notes:
1. Source: 2011/12 New Zealand Health Survey.
2. 'People with no gambling problems' have been defined as non-gamblers and recreational gamblers.
3. Due to small cell sizes / denominators (n<30), the 'problem' and 'moderate-risk' categories have been combined to enable their inclusion in these analyses.
4. Logistic regression analyses have controlled for gender, age-group, prioritised ethnic group, neighbourhood deprivation and geography (urban/rural).

Appendix K   Use of health services and gambling

Table 32:   Use of health services and gambling status (PGSI categorisation), total population aged 15 years and over (unadjusted prevalence) [1]

VARIABLE	TOTAL ADULT POPULATION		GAMBLING STATUS							
			Non-gambler		Non-problem / recreational		Low-risk		Combined moderate-risk and problem [2]	
	n (N)	% (95% CI)	n (N)	% (95% CI)	n (N)	% (95% CI)	n (N)	% (95% CI)	n (N)	% (95% CI)
USE OF GENERAL PRACTITIONER:										
- Has seen a GP (in the previous 12 months)	**10,063 (12,574)**	**78.5 (77.5 - 79.6)**	4,674 (10,062)	75.6 (74.1 - 77.2)	5,023 (10,062)	81.2 (79.8 - 82.6)	218 (10,062)	77.8 (71.4 - 84.2)	147 (10,062)	84.6 (78.2 - 91.0)
UNMET NEEDS – GENERAL PRACTITIONER:										
- Has had an unmet need for GP services (in the previous 12 months)	**1,222 (12,577)**	**8.6 (7.9 - 9.3)**	565 (1,222)	8.1 (7.2 - 9.0)	561 (1,222)	8.5 (7.5 - 9.4)	57 (1,222)	17.1 (11.8 - 22.3)	39 (1,222)	22.0 (13.8 - 30.3)
- Has had an unmet need for GP services *due to cost* (in the previous 12 months)	**2,030 (12,589)**	**13.8 (12.9 - 14.7)**	1030 (2,030)	13.7 (12.5 - 14.9)	865 (2,030)	13.0 (11.8 - 14.1)	82 (2,030)	26.5 (19.9 - 33.1)	53 (2,030)	27.0 (18.1 - 35.9)
USE OF OTHER HEALTH PROFESSIONALS:										
- Has seen a psychologist, counsellor or social worker (in the previous 12 months)	**590 (12,596)**	**3.9 (3.5 - 4.3)**	302 (590)	4.2 (3.6 - 4.8)	244 (590)	3.4 (2.8 - 4.0)	19 (590)	5.5 (2.6 - 8.5)	25 (590)	12.5 (6.2 - 18.8)

Notes:

1. Source: 2011/12 New Zealand Health Survey.
2. Due to small cell sizes / denominators (n<30), the 'problem' and 'moderate-risk' categories have been combined to enable their inclusion in these analyses.

Table 33: *Gambling status by use of health services, total population aged 15 years and over – Odds ratios and p-values* [1]

VARIABLE	GAMBLING STATUS			p-value [4]
	People with no gambling problems [2]	Low-risk	Combined moderate-risk and problem [3]	
	Odds ratio	Odds ratio (95% CI)	Odds ratio (95% CI)	
USE OF GENERAL PRACTITIONER:				
- Has seen a GP (in the previous 12 months)	1	1.2 (0.9 - 1.8)	2.0 (1.2 - 3.3)	0.0161
UNMET NEEDS - GENERAL PRACTITIONER:				
- Has had an unmet need for GP services (in the previous 12 months)	1	2.1 (1.4 - 3.1)	2.6 (1.6 - 4.3)	<0.0001
- Has had an unmet need for GP services *due to cost* (in the previous 12 months)	1	2.1 (1.5 - 3.1)	1.9 (1.2 - 3.0)	<0.0001
USE OF OTHER SERVICES:				
- Has seen a psychologist, counsellor or social worker (in the previous 12 months)	1	1.4 (0.8 - 2.6)	3.4 (1.9 - 6.2)	0.0002

Notes:

1. Source: 2011/12 New Zealand Health Survey. Logistic regression analyses have controlled for gender, age-group, prioritised ethnic group, NZDep2006 quintiles and urban/rural status.
2. 'People with no gambling problems' have been defined as non-gamblers and recreational gamblers.
3. Due to small cell sizes / denominators (n<30), the 'problem' and 'moderate-risk' categories have been combined to enable their inclusion in these analyses.
4. Logistic regression analyses have controlled for gender, age-group, prioritised ethnic group, neighbourhood deprivation and geography (urban/rural).

Appendix L   Experiencing problems due to someone else's gambling – activity that was involved

Table 34:   *People affected by someone else's gambling by demographics, total population aged 15 years and over (unadjusted prevalence; N=12,576) [1]*

		AFFECTED BY OTHER'S GAMBLING		Odds ratio (95% CI)	p-value
		n	% (95% CI)		
Total		391	2.5 (2.2 - 2.9)	-	--
By Gender	Male	136	2.1 (1.7 - 2.6)	0.7 (0.5 - 1.0)	0.0294
	Female	255	2.9 (2.4 - 3.4)	1	
By Age-group	15 - 24	50	2.7 (1.8 - 3.7)	2.1 (1.2 - 3.8)	<0.0001
	25 - 34	95	3.9 (2.9 - 5.0)	3.2 (2.0 - 5.3)	
	35 - 44	101	3.0 (2.3 - 3.8)	2.7 (1.7 - 4.3)	
	45 - 54	69	2.6 (1.7 - 3.5)	2.4 (1.4 - 4.0)	
	55 - 64	41	1.7 (1.1 - 2.3)	1.6 (0.9 - 2.8)	
	65+	35	1.1 (0.7 - 1.5)	1	
By Ethnicity [2]	Māori	174	6.0 (4.9 – 7.2)	2.8 (2.1 - 3.8)	<0.0001
	Pacific	53	4.6 (3.1 – 6.1)	2.0 (1.3 - 3.1)	
	Asian	<30	-	0.8 (0.4 - 1.6)	
	European/Other	242	2.3 (1.9 – 2.7)	1	
By Neighbourhood Deprivation (NZDep2006)	1 (least deprived)	35	1.8 (1.1 - 2.5)	-	0.51
	2	42	1.8 (1.1 - 2.5)	-	
	3	67	2.4 (1.6 - 3.2)	-	
	4	91	3.0 (2.2 - 3.8)	-	
	5 (most deprived)	156	3.8 (3.0 - 4.6)	-	
By Geography	Rural	<30	-	-	0.22
	Urban	372	2.6 (2.3 - 3.0)	-	

Notes:
1. Source: 2011/12 New Zealand Health Survey.
2. Respondents are counted in each of the ethnic groups that are applicable to them; respondents who identify with more than one ethnic grouping are included in each of the relevant groups. As such, it is inappropriate to compare these ethnic-specific proportions as mutually exclusive categories. Percentages and 95% confidence intervals have been age-standardised in accordance with World Health Organisation (WHO) age population distributions (Ahmad et al., 2001).

Table 35: *Been impacted by other's gambling – activity that was involved, those who have been impacted (unadjusted prevalence; N=391) [1]*

AFFECTED BY OTHER'S GAMBLING - ACTIVITY THAT WAS INVOLVED [2]	n	% (95% CI)
Non-casino gaming machines	229	52.9 (45.8 - 60.0)
Casino gaming machines	115	32.0 (25.4 - 38.5)
Track or sports betting	70	22.1 (16.3 - 27.9)
Casino tables	30	9.8 (5.4 - 14.2)
Other form of gambling (including Housie and Internet-based gambling)	33	9.7 (5.0 - 14.4)
Lotto[3] or Instant Kiwi (or other scratch tickets)	<30	-

Notes:
1. Source: 2011/12 New Zealand Health Survey. NB: Due to small cell sizes/denominators (n<30), some activities were combined with others to enable their inclusion in the analyses.
2. Multiple responses were allowed.
3. Lotto includes 'Strike', 'Powerball', 'Big Wednesday' and 'Keno'.